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A Sequential Analysis of Staff Training Procedures to Efficiently Teach Novice Instructors to Implement Errorless Discrete-Trial Teaching Procedures

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A SEQUENTIAL ANALYSIS OF STAFF TRAINING PROCEDURES TO EFFICIENTLY TEACH NOVICE INSTRUCTORS TO IMPLEMENT ERRORLESS DISCRETE-TRIAL TEACHING PROCEDURES

by

Jamie M. Severtson

A Dissertation Submitted to the Faculty of The Graduate College in partial fulfillment of the requirements for the Degree of Doctor of Philosophy Department of Psychology Advisor: R. Wayne Fuqua, Ph.D.

Western Michigan University Kalamazoo, Michigan August 2010
A SEQUENTIAL ANALYSIS OF STAFF TRAINING PROCEDURES TO EFFICIENTLY TEACH NOVICE INSTRUCTORS TO IMPLEMENT ERRORLESS DISCRETE-TRIAL TEACHING PROCEDURES

Jamie M. Severtson, Ph.D.
Western Michigan University, 2010

Discrete trial teaching (DTT) is the most common techniques incorporated into intensive behavioral intervention programs for children diagnosed with autism. Errorless learning (EL) prompt fading strategies are frequently recommended during DTT because they often result in more efficient and effective instruction. Several variables may prevent agencies from offering extensive supervised training to instructors; therefore, time-efficient DTT staff training protocols are needed. The purpose of the present study was to conduct a sequential analysis of the efficacy of three methods for teaching errorless DTT procedures to novice instructors. These methods included: (a) a self-instruction manual, (b) an instructional video, (c) and brief performance feedback. Three participants, with mean baseline performance ranging from 24.6% to 49.1% accurate, mastered DTT following self-instruction with mean performances ranging from 86% to 93.3% accurate. Three additional participants, with
mean baseline performances ranging from 22.6% to 36.8% accurate progressed through self instruction with means ranging from 39.7% to 72.3% accurate, video modeling with means ranging from 52.6% to 82.6% accurate, and finally reaching mastery following performance feedback with means ranging from 94.2% to 96.2% accurate. The current makes three contributions to the literature: (a) illustrating an efficient, sequential analysis of staff training procedures, (b) introduction of an improved self-instruction manual which was demonstrated as an efficient staff training tool for some participants, and (c) clearly delineated guidelines for implementing an EL prompt fading strategy during DTT.
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Jamie M. Severtson
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CHAPTER I

INTRODUCTION

Early Intensive Behavioral Intervention

Evidence-Based Practice

Years of investigation of applied behavior analytic (ABA) techniques have resulted in teaching strategies that produce reliable and robust improvements in the three core areas of autism (Matson, Benavidez, Compton, Paclawskyj, & Baglio, 1996). Outcome studies on early and intensive behavioral intervention (EIBI) programs, which incorporate a variety of ABA teaching methods, have reliably demonstrated that EIBI produces large improvements in intellectual and adaptive functioning. Additionally, EIBI often leads to general education placements for up to 50% of students who may appear indistinguishable from their typical peers (e.g., Lovaas, 1987; Sallows & Graupner, 2005). These treatment gains have been shown to maintain into late childhood (McEachin, Smith, & Lovaas, 1993) and have been reported as more robust than common interventions such as parent
training (Bibby, Eikeseth, Martin, Mudford, & Reeves, 2001; Smith, 2001) and "eclectic" interventions common in public special education programs (Cohen, Amerine-Dickens, & Smith, 2006; Eldevik, Eikeseth, Jahr, & Smith, 2006; Howard, Sparkman, Cohen, Green, & Stanislaw, 2005). In fact, behavioral interventions are considered the only evidenced-based practices (Frea & McNerney, 2008) or "well-established" interventions (Eikeseth, 2009) for children with autism according to the American Psychological Association’s guidelines for classifying treatments according to empirical support (Chambless et al., 1996; Chambless & Holon, 1998). In 2009, the National Autism Center published a review of the research available on 38 treatments aimed at improving the core deficits autism spectrum disorders (National Standards Project; National Autism Center, 2009). Eleven of these treatments were classified as "established" in that they result significant improvements in the symptoms of autism spectrum disorders (ASD), and the majority of the treatments were behavior-analytic in nature. In fact, the authors indicated that, "this pattern of findings suggests that treatments from the behavioral literature have the strongest research support at this time" (p. 16). Furthermore, a behavioral-educational approach is
the only intervention recommended by the New York State Department of Health (1999) and by the U.S. Surgeon General (1999) for children diagnosed with autism.

Characteristics of EIBI

The curricula developed for EIBI programs focus on preparing children for the transition into general education classrooms by teaching them how to learn in natural environments (Leaf & McEachin, 1999; Lovaas, 2003; Maurice et al., 1996; Maurice, Green, & Foxx, 2001). Typically, EIBI programs provide 20 to 40 hrs per week of one-to-one instruction to children with autism (ages 2-5) in a home or school environment (Frea & McNerney, 2008). Discrete-trial teaching (DTT) is the most common instructional technique incorporated into such programs (Frea & McNerney; Smith, 2001). The core element of DTT is the trial, which can be conceptualized as five separate components: the discriminative stimulus, the prompt, the learner's response, the consequence for the learner's response, and the inter-trial interval (Smith). Discrete-trial teaching is often used to teach discrimination training, which is one of the main focal points of EIBI programs, as it is a prerequisite for the development of many other skills (Green, 2001).
The initial staffing pattern for EIBI programs for children with autism is often a one-to-one ratio of instructors to students until children learn skills that prepare them for small-group instruction (Anderson & Romancyzk, 1999). In an investigation on training teachers to implement various ABA instructional strategies, Koegel, Russo, and Rincover (1977) demonstrated that increased teacher accuracy resulted in improved student performance. Given the vast number of skill categories that can be taught in a discrete-trial manner, extensive training is required to ensure high rates of mastery for students (Smith, 2001). In fact, Smith, Parker, Taubman, and Lovaas (1992) indicated that 25 to 60 hrs of supervised training may be required for novice instructors to implement instructional strategies with high fidelity. Smith, Donahoe, and Davis (2000) suggest that a year or more of supervised instruction with multiple children may be necessary for someone to become an "expert" instructor. A high demand for services, budgetary limitations, and high turnover rate of staff may prevent agencies from being able to offer such extensive supervised training to instructors (Jacobson & Mulick, 2000); therefore, time-efficient DTT staff-training protocols are needed.
Training Staff to Implement DTT

One efficient method of training instructors to implement DTT is through the use of a self-instruction manual. Arnal et al. (2007) provided naïve instructors (college students) with a 21-page instruction manual (Fazzio & Martin, 2006) on DTT along with review questions over the material interspersed throughout the manual. The manual included information on basic behavioral principles (e.g., reinforcement, extinction), instructions on the prompt fading strategies graduated guidance and time delay, a description of a matching program, instructions on implementing DTT and delivering instructions, a 1-page description of the DTT steps, and examples of data collection procedures for multiple instructional programs. Participants were instructed to learn the material presented in the manual, which was measured by a test comprised of randomly chosen review questions of an unknown format. Participants were allowed to study the manual until they were able to score 100% on the quiz. On average, participants spent about 2.25 hours studying. After they passed the exam, participants were given a 1-page summary of 16 DTT steps, and were required to demonstrate DTT for three tasks with
a confederate. Three of the four participants demonstrated improvements in their instruction; however, only one participant was able to demonstrate mastery of the DTT steps (performance ≥ 90%) with 1 of the 3 tasks. In a second experiment, new participants were asked to learn the material in the self-instruction manual as well as view and score the performance of a video of an instructor implementing one task with a confederate learner, using the 16-step DTT checklist. Following training, only 1 of the 3 participants demonstrated mastery of DTT instruction in three sessions, one for each of the three tasks.

Fazzio, Martin, Arnal, and Yu (2009) incorporated the use of the self-instruction manual (Fazzio & Martin, 2006) as well as demonstration and feedback sessions for instructors who did not reach mastery level with the instruction manual alone. In this study, participants reviewed the manual one section at time for varying amounts of time (e.g., 30 min for section 1), and they were required to answer the study questions in each section as they read rather than waiting until the end of the section. Following each section, participants were given a quiz over that section, and if they answered any questions incorrectly, they were required to review the
corresponding section in the manual and re-answer the question until they were able to answer all of the questions with 100% accuracy. As was the case in Arnal et al. (2007), reviewing the self-instruction manual resulted in improved performance (with confederates) for all participants; however, only one participant reached mastery-level performance (≥ 90%) on 2 of the 3 tasks. All five participants went on to receive 1 to 3 sessions of feedback and demonstration on their performance along with demonstrations of one (unmastered) task provided by experimenters. This instructional session lasted approximately 35 min. After the demonstration and feedback sessions, all instructors had reached mastery level for that particular DTT task. Four participants demonstrated generalization of skills to the two other remaining DTT tasks with confederates as well as with children. Because the remaining participant had already mastered the two remaining tasks, generalization was not assessed. The skills for all five participants generalized to implementation of DTT with children with autism. These results indicate that a few brief sessions of demonstration and feedback following the mastery of a self-instruction manual may be sufficient for mastery and generalization of DTT skills for novice instructors.
In a similar study, Thiessen et al. (2009) trained college students to implement DTT using a 37-page, revised version of the self-instruction manual used in the previously described studies (Fazzio & Martin, 2007). Participants received both course credit and payment ($10 for each session where performance was ≥ 90%) for their involvement. Similar to Fazzio et al. (2009), participants studied the manual in sections and took quizzes at the end of each; however, following each quiz, participants were prompted to engage in an imaginary self-practice exercise in which they were asked to pretend to teach three specified tasks. Participants spent on average 4.5 hours with the manual. Participants were then provided with a 2-page DTT checklist and were asked to demonstrate their instruction skills first with confederate learners and finally with learners diagnosed with autism. Although all four participants demonstrated large improvements in their DTT skills with confederates, only 1 of the 4 reached a mean performance accuracy of 90%, across three tasks, and the remaining three participants scored mean accuracies between 83% and 88%. If participants received a score of ≥ 80% on a given task(s), they went on to implement those tasks with a child with autism in the generalization phase, which
resulted in mean performance below 90% for all participants. The results of these studies indicate that while the use of a self-instruction manual (with or without self-practice) during training will likely result in the improvement of skills, when used alone it is unlikely to lead to mastery of the skill set. For mastery performance to be achieved, a manual may need to be used conjunction with demonstration and feedback.

While the previous studies included the use of a self-instruction manual, only procedures which included performance feedback and demonstration reliably resulted in mastery of DTT skills. Gilligan, Luiselli, and Pace (2007) evaluated the effectiveness of rehearsal and performance feedback when teaching DTT to three school personnel (instructional assistants). Each participant was assigned to work with one child who attended the school in a different classroom than the participant had been assigned to work. A notable difference in this study compared to the previously described studies, is that participants were not only allowed to review the protocol for the DTT task that they were attempting to implement in baseline, but were also allowed to ask the experimenter any questions regarding implementation. Following the last baseline session, experimenters began
to provide corrective feedback or praise for the performance of each individual DTT skill component that was performed with less than 90% accuracy. Each feedback session lasted between 5 to 8 min. All three participants met mastery-level performance after 1 to 3 intervention sessions. Due to staff turnover, only one participant was available for a follow-up probe after three months, and her score was 94%. It is worth noting that baseline performance for this particular participant was an average of 85% accuracy - much higher than the other participants - which may have contributed to her ability to maintain skills with such high accuracy. In addition, although demonstration of skills was not a programmed intervention, participants were able to observe the implementation of DTT skills with other students in their school, just not the students to which they were assigned in the study. This may have also resulted in better performance. Finally, another potential limitation of this study is that participants demonstrated their skills with children with autism who had already mastered the tasks being implemented, so prompting procedures were not included in the information provided in baseline and it is unclear whether prompting procedures were taught during training. It is possible that results would have
been different if participants had experienced implementing DTT with more challenging learners. Although these results indicate that a self-instruction manual may not be necessary for efficient training of DTT skills when rehearsal and brief performance feedback are provided, it is also possible that another variable (e.g., observation of modeling during the school day) may have had some impact on performance.

LeBlanc, Ricciardi, and Luiselli (2005) obtained similar results with abbreviated performance feedback, and the accuracy of staff performance maintained at follow-up probes for up to 11 weeks following training. In this study, generalization was not assessed, and it was unclear whether the children in the study had already mastered the skills being taught. Also noteworthy is that the participants had been employed for up to six months and had many opportunities to observe other assistants implement DTT prior to baseline. This may indicate that these observations did not have a major impact on performance given that all participants scored at or below 50% accuracy in baseline sessions. The results of these two studies indicate that the use of rehearsal and brief performance feedback alone may be an adequate
intervention for teaching DTT skills to novice instructors.

Behavioral skills training (BST) packages for staff typically involve providing staff with instructions, models of examples and non-examples of the target skills, opportunities for rehearsal, and feedback on performance (Miltenberger, 2004). Sarokoff and Sturmey (2004) used BST to teach three instructors to implement DTT to teach a matching program with a child in his home. Interestingly, although participants all held or were pursuing a master’s degree in special education, had received training in DTT in the past, and had been implementing DTT with students for 5 months to 2 years, they all performed well below mastery level in baseline. Training sessions were approximately 10 min in duration, during which both written and verbal instructions, graphs of the instructor’s baseline performance, modeling, and verbal feedback to correct instructor errors were provided. Training continued until participants scored ≥ 90% across 3 consecutive 10-trial blocks. While all three participants acquired and maintained DTT skills, training data were not included so it is unclear how many training sessions were required for each instructor to acquire the DTT skills, although the authors indicate that skills
were mastered "quickly." No follow-up data were collected, so it is unknown whether the skills maintained over time. Results of a follow-up study indicate that only three BST sessions were required for three different instructors to reach mastery criteria for teaching matching skills to one child, and those DTT skills generalized to teaching other programs and other children (Sarokoff & Sturmey, 2008). Lefasakis and Sturmey (2007) replicated these results with parents and also demonstrated that improved parent instruction resulted in improved child performance, and that acquired DTT skills generalized to programs that were not included during training. Improvements in instructor DTT skills following BST have also resulted in reductions in student engagement in stereotypy (Dib & Sturmey, 2007).

Downs, Downs, and Rau (2008) used a modified BST approach to teach instructors in a public school setting to implement a variety of programs using DTT with students who had various disabilities. Prior to baseline, participants attended an 8-hr training session, which was meant to resemble a common school in-service day. Training included didactic training, live modeling of correct and incorrect implementation of DTT, multiple practice opportunities with different students (including
two 30-min DTT sessions), and feedback from trainers. Baseline data were collected using a 30-item checklist of DTT skills to measure instructor performance during a regular workday following the in-service, and the accuracy of all participants ranged from 60% to 80%. During intervention, the same checklist was used and participants were provided with oral feedback throughout each session. After a few sessions, participants began to work with different children to program for generalization of skills. Following intervention, all six instructors reached the mastery criterion, and performance maintained during all follow-up visits up to 10 weeks after training. Additionally, all four students receiving instruction demonstrated a substantial increase in the percentage of correct responses during DTT following instructor training. The results of this study are interesting because the accuracy of instruction maintained at 100% for 5 of the 6 instructors during follow-up sessions even though the instructors had no additional programmed supervision following training. Historically, DTT requires a great deal of training supervision, and these results suggest that proficiency may be reached through rapid training (including a feedback component) and maintained with little...
supervision, a finding that is consistent with other research (Sarokoff & Sturmey, 2008). It should be noted that "true" baseline performance was not assessed for any of the participants, so there is no way to determine what impact, if any, the 8-hr in-service had on performance.

Ryan and Hemmes (2005) modified traditional BST by incorporating video instructions in addition to both written and verbal (lecture) instructions. Instructor performance during training was considered mastered after instructors scored 100% accuracy on 20 written and oral quizzes as well as performance demonstrations. All instructors achieved mastery of DTT skills. It should be noted that a clear description of the video instructions was not provided, and no baseline data were collected for comparison, although the authors report that the participants had received no training prior to the intervention. Crocket, Fleming, Doepke, and Stevens (2007) also used video instruction either with a model or with participants demonstrating the correct and incorrect DTT implementation in 2-hr training sessions. In this study, participants, who were two parents of children with autism, not only observed modeling in videos, but also scored instructional trials demonstrated in the video and were asked to explain their scores.
Experimenters provided feedback on scoring accuracy as well as the parents' DTT performance. Parents first demonstrated mastery of their DTT skills with a confederate and then with their own children, and their skills generalized across untrained program areas in only 2 to 4 training sessions. Child performance data reveals moderate increases in performance across various tasks; however, those data were only collected for a brief period of time. It is possible that larger improvements may have been observed during a longer data collection period. Although participants were able to master the steps of DTT, it is unclear whether observing the video models and scoring were both necessary components of the intervention.

Belfiore, Fritts, and Herman (2008) evaluated self-monitoring from video as the sole training component used to improve DTT skills of four staff members. Prior to the study, the participants had received approximately two weeks of on-the-job training at the start of their employment in addition to regular consultations and 24 hours of agency in-service training. Experimenters used a five-item checklist to score the performance of the three participants. Despite receiving agency training, mean scores for all three participants were below 30% during
baseline. Participants were then taught to use the checklist to score their own performances from video, and after each scoring session, participants implemented DTT with an individual. Video scoring and DTT sessions were alternated until participants received three consecutive performance accuracy scores of 90% or above. All three participants reached mastery criteria using this training procedure in 4 to 8 sessions. Participants were then allowed to return to implementing DTT without self-monitoring, and only one participant’s performance maintained at mastery level, while performance for the other two participants fell below mastery within three sessions. One participant resumed training and performance immediately returned to mastery level. The results of this study indicate that although self-monitoring through video scoring may result in mastery of DTT skills, removal of self-monitoring is likely to result in prompt performance deterioration. Periodic self-monitoring following mastery may be necessary to maintain performance over time.

Many of the BST studies incorporated the use of a video model as part of the treatment package. Catania et al. (2009) analyzed the use of video modeling as the sole training strategy for teaching staff to implement DTT.
Three participants observed a short video (7 min 15 s) of two teachers implementing one DTT task. After observing the video multiple times, all three participants reached mastery level, and these skills generalized to two additional tasks and maintained at 1-week follow-up probe. Two participants successfully implemented DTT with a student, although no information was provided about the student; therefore, the student's skill level for the various tasks is unknown. This study provides some evidence that video modeling alone may be an efficient means of training some novice instructors to implement DTT.

Some of the training studies described above utilized confederates during training and post-training sessions (e.g., Arnal et al., 2007). Although counterintuitive, having confederates rather than children with autism practice with instructors in training may be beneficial for several reasons. Confederates are often experienced staff or assistants who are familiar with common challenges associated with this type of instruction and can likely mimic challenging behaviors. This ensures that the participants receive adequate learning opportunities with different types of student errors and correct responses. Confederates can
also use scripts to ensure that participants practice many different challenging scenarios (e.g., failure to respond, self-correction following an error, throwing materials). This also allows experimenters to control the level of difficulty of training across participants. When using actual children, it is impossible to predict what performance will be like from trial to trial, and some children may exhibit more challenging behavior than others, which allows for a great deal of variation in the learning experiences across participants. Children may also exhibit fatigue and other changes in motivation that could impact their willingness to participate in training.

Errorless Learning

Various prompt fading strategies (e.g., graduated guidance, time delay), developed to gradually transfer stimulus control from a prompt to the appropriate discriminative stimuli ($S^P$) (e.g., instructions, pictures, flashcards) while avoiding prompt dependence (e.g., system of least prompts, time-delay), were incorporated into DTT in the studies reviewed in this manuscript. Errorless learning (EL), also known as decreasing assistance, is a term that encompasses a
variety of procedures aimed at reducing learner errors (Clare & Jones, 2008; Etzel & LeBlanc, 1979; Mueller, Palkovic, & Maynard, 2007). When implementing EL, a hierarchy of prompts is determined prior to instruction, and these prompts are ranked from the highest level of intrusiveness to the lowest. The initial prompt, the highest level, is presented along with or immediately following the $S^0$ to ensure that the learner engages in the correct response. The prompt level is reduced after a specified number of trials as long as the learner continues to respond correctly. If at some point the learner makes an error or fails to respond the prompt level is increased. Prompts are gradually faded in a most-to-least fashion to decrease the number of errors while stimulus control is transferred from the prompts to the naturally occurring $S^0$.

Although in clinical practice the terms "errorless learning" and "most-to-least prompting" might be used interchangeably, in published research studies, the term most-to-least (MTL) is typically used to describe a prompt fading strategy with a hierarchy that begins with full physical guidance (Batu, Ergenekon, Erbas, & Akmanoglu, 2004; Cuvo, Leaf, & Borakov, 1978; Demchak, 1990). In clinical settings, practitioners often use
physical guidance or most-to-least prompts when working with students. For example, MTL has been used when teaching pedestrian skills (Batu et al., 2004), Internet skills (Jerome, Frantino, & Sturmey, 2007), janitorial skills (Cuvo et al., 1973), and activity schedules (Massey & Wheeler, 2000) to individuals with developmental disabilities.

Overall, the results of current research on prompt fading strategies indicate that MTL prompt fading is often more efficient and sometimes more effective than other prompt fading strategies (Csapo, 1981; Day, 1987; Gentry, Day, & Nakao, 1979; McDonnell & Ferguson, 1989; Miller & Test, 1989). Recent recommendations for practitioners promote the use of EL procedures (e.g., most-to-least) (Kayser, Billingsley, & Neel, 1986; McDonnell & Ferguson, 1989) and these strategies are often incorporated in the implementation DTT in EIBI programs (Love, Carr, Almason, & Petursdottir, 2009), although clear guidelines for their use in this type of instruction have yet to be delineated.
CHAPTER II

RATIONALE FOR CURRENT INVESTIGATION

Several studies have demonstrated effective strategies for training instructors to implement DTT procedures either with confederates or children with autism. Of these studies, none have included the use of a clear MTL approach to prompt fading as part of their DTT protocols, and in some cases a prompting procedure or errorless correction procedure was not clearly described at all (e.g., LeBlanc et al., 2005). Thus, the purpose of the present study was to conduct a sequential analysis (e.g., DiGennaro Reed, Codd, Catania, & Maguire, 2010) of the effectiveness of training procedures to teach novice instructors to implement a commonly used DTT intervention that incorporates EL, which has not been included in the DTT training literature to date. This study extends self-instruction research (Arnal et al., 2008; Fazzio et al., 2009; Thiessen et al., 2009) by evaluating the effects of a revised self-instruction manual based on the Fazzio and Martin (2006) manual. It also extends research on video modeling (e.g., Catania et
al., 2009) and brief performance feedback (e.g., Gilligan et al., 2007; LeBlanc et al., 2005) to improve DTT skills. A confederate learner was used during baseline sessions, training sessions for the performance feedback phase, and in all post-training sessions to standardize training experiences across participants. This study was approved by the Human Subjects Institutional Review Board at Western Michigan University (see Appendices A, B, and C).
CHAPTER III

METHOD

Background

This study was conducted as part of sequence of training modules for new staff and volunteers of an in-home autism program, which is affiliated with a large, non-profit social service agency located in the southwest suburbs of Chicago, IL. The agency receives reimbursement for training from a state funding agency, which dictates that 40 hours of "pre-service" (classroom) training and 80 hours of on-the-job training must be completed by every newly hired staff member who spends at least 20% of his/her time interacting with clients. Certain modules in this training are outlined by the state and other modules can be developed at the discretion of the agency. The results of this study will be used to shape the development of one of the agency's discretionary pre-service staff-training modules.
Participants and Setting

Six novice instructors participated in this study. Participants were newly hired, less-than-part time employees (< 20 hours per week) or volunteers of an in-home autism program, which provides one-to-one instruction for approximately 10 hours per week to individuals diagnosed with autism spectrum disorders, ages 2 to 21. Lisa was a 25-year-old female who was completing her final semester in an undergraduate psychology program. She had no experience implementing DTT or ABA instructional strategies and had never worked with individuals with autism or other developmental disabilities. Theresa was a 22-year-old female who had completed several college-level courses and had some experience working with at least one individual with autism; however, she had no background in DTT or other ABA instructional strategies. Donna was a 33-year-old female who had completed several college level courses and was working full-time as a classroom assistant in a special education classroom for individuals with learning disorders in a public school setting. She had no background in DTT or other ABA instructional strategies.
The remaining participants, Donald, Michael, and Heather, all held full-time jobs as classroom assistants in a non-public school for individuals with developmental disabilities. All three participants were primarily responsible for the education and care of adolescent or young adult students enrolled in the school, and all three had received some training in general ABA strategies at the start of their employment; however, none of the participants had implemented these strategies in at least a year. None of these participants had received any training in EL prompt fading strategies or had worked with young children diagnosed with autism. Donald was a 24-year-old male who had completed a few college-level courses. Both Michael, a 26-year-old male, and Heather, a 26-year-old female, had completed high school but had no college experience. During the course of the training, participants who were also employees of the autism program received their normal wages for participation, but received no other incentives.

Sessions were conducted in a private office or a conference room in an outpatient clinic for children with autism spectrum disorders. All sessions were digitally recorded for subsequent data collection, and the experimenter (the author) was present for each. The
duration of each session varied based on the phase of the study and participant availability. In some sessions (e.g., baseline), participants were only asked to implement DTT with the experimenter (the confederate) 2 to 4 times for up to 10 min each time. These sessions were typically conducted for 30 to 45 min. During the intervention phases, sessions sometimes included an instructional component (e.g., review of the self-instruction manual) followed by 1 to 3, 10-min post-training DTT implementations with a confederate. The duration of these 2-part sessions ranged from 1.5 to 3 hours. Sessions were conducted 2 to 4 times per week.

Materials

A table and three chairs were used during each session along with pens, data sheets (see Appendix D) for the participant to record the responses of the confederate, 1-page written instructions for target and generalization DTT tasks (see Appendices E and F), instructional stimuli sets, and mock preferred items (e.g., a musical toy telephone, a push-and-go toy tractor, and a small cardboard book shaped as a car that had rolling wheels) to be used as programmed consequences with confederates. A laptop computer and a remote slide
advancer were also present, which was used to display the scripts (see Appendix G) for the confederate and was out view for the participant once the session began. During the video modeling phase of the study, the laptop was also used to play a 41-min instructional video which included clips of two different experienced clinicians (Board Certified Behavior Analysts) modeling examples and nonexamples of DTT with a confederate for the participant. During the self-instruction phase, a 53-page self instruction manual (see Appendix H), a quiz over the material (see Appendix I), a notebook, and a highlighter were also available. Data sheets were also available to record participant responses (see Appendix J).

Data Collection

The primary dependent variable for this study was participant accuracy of the implementation of the steps of DTT. Data on participant behavior during DTT with a confederate were collected from video of all sessions using a DTT performance checklist (see Appendix J). The checklist was created based on the published literature (e.g., Arnal et al., 2007; Thiessen et al., 2009) and pilot data, and each item was scored by checking a “C” if the step was performed correctly, an “I” if the step was
performed incorrectly, or "N/A" if the step was unnecessary. There were also places on the checklist to record additional information (e.g., the order of flashcard presentation) that was then used to aid in the scoring of a step in the checklist. Discrete-trial performance was scored by dividing the number of correctly performed steps by the total number of correct and incorrect steps and converting the resulting ratio to a percentage. The mastery criterion for performance was 90% of steps performed correctly during 3 consecutive trial blocks, each consisting of 12 trials each (3 probe trials and 9 teaching trials). All of the components of the checklist are defined in Table 1 below.

Table 1

Definitions of Each Correct Target Behavior Listed in the Discrete Trial Training Checklist Data Sheet

<table>
<thead>
<tr>
<th>Target Behavior</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organize data (a) Listed each target</td>
<td>Listed each target 1 time each in probe section (not consecutively)</td>
</tr>
<tr>
<td>sheet prior to (b) Listed each target</td>
<td></td>
</tr>
<tr>
<td>session</td>
<td>3 times each in teaching trials section (not consecutively)</td>
</tr>
<tr>
<td>Materials presented correctly (a)</td>
<td>Flashcards presented in different order than the previous trial (Exception: of the first trial of each DTT session)</td>
</tr>
<tr>
<td></td>
<td>(b) Target item placed in different location (left, right, center) than the previously presented target item</td>
</tr>
<tr>
<td></td>
<td>(c) Flashcards were even spaced</td>
</tr>
<tr>
<td></td>
<td>(d) All of the flashcards presented equidistant from the participant</td>
</tr>
<tr>
<td></td>
<td>(e) All three flashcards were presented at the same time</td>
</tr>
<tr>
<td></td>
<td>(f) No other materials were located in the instructional area</td>
</tr>
<tr>
<td>Table 1 - continued</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Materials presented correctly (probe sessions only)</strong></td>
<td></td>
</tr>
<tr>
<td>(a) One item (or target set) was placed in front of the participant and the other identical item (or target set) was placed in front of the participant</td>
<td></td>
</tr>
<tr>
<td>(b) No other materials were located in the instructional area in front of the participant on the table</td>
<td></td>
</tr>
<tr>
<td>** Appropriately secure the child’s attention **</td>
<td></td>
</tr>
<tr>
<td>(a) Used one appropriate phrase (e.g., &quot;look&quot;) one time and/or nonverbal method of securing the confederate’s attention</td>
<td></td>
</tr>
<tr>
<td>(b) Waited to provide the instruction until the participant was looking either at the participant or at the instructional materials on the table</td>
<td></td>
</tr>
<tr>
<td>(c) Refrained from touching each individual card or otherwise drawing attention to an individual card prior to instruction</td>
<td></td>
</tr>
<tr>
<td>(d) Refrained from using an inappropriate means of gaining the confederate’s attention (e.g., snapping fingers, tapping table)</td>
<td></td>
</tr>
<tr>
<td>(e) Refrained from saying the name of any of the flashcards prior to instruction</td>
<td></td>
</tr>
<tr>
<td>(f) Secured attention within 3 seconds of providing the instruction</td>
<td></td>
</tr>
<tr>
<td>** Delivered appropriate instruction **</td>
<td></td>
</tr>
<tr>
<td>(a) Used a short phrase with a clear lead, and no additional descriptors, such as: “Give me ___,” “Where’s the ___,” “Find the ___,” “Show me the ___,” or “Hand me ___” (or something similar)</td>
<td></td>
</tr>
<tr>
<td>(b) Used a phrase that contradicted the correct confederate response (i.e., picking up the card, extending the arm with card in hand towards the instructor) such as, “point to ___” or “touch the ___”</td>
<td></td>
</tr>
<tr>
<td>(c) Refrained from using extra descriptors (e.g., “give me the grey dog”)</td>
<td></td>
</tr>
<tr>
<td>(d) Refrained from using an incorrect target label (e.g., “birdie” vs. “bird”)</td>
<td></td>
</tr>
<tr>
<td>** Waited 3 seconds for a response (probe trials only) **</td>
<td></td>
</tr>
<tr>
<td>(a) After delivering the instruction, refrained from providing a prompt, removing the flashcard, or delivering another instruction before 3 seconds elapses</td>
<td></td>
</tr>
<tr>
<td>(b) If the confederate engaged in an error response before 3 seconds elapses, this was automatically scored as correct</td>
<td></td>
</tr>
<tr>
<td>** Provided immediate and correct prompt level (as needed) (teaching trials only) **</td>
<td></td>
</tr>
<tr>
<td>(a) First teaching trial for a given target: Following the instruction or while the instruction was being provided, participant immediately provided the same prompt level that was used to bring about the correct confederate response for the probe trial for</td>
<td></td>
</tr>
</tbody>
</table>
Table 1 - continued

<table>
<thead>
<tr>
<th>Correct use/non-use of reinforcers (teaching trials)</th>
<th>Provided a mock tangible reinforcer AND praise immediately following a correct confederate response (prompted or unprompted) if the confederate responded correctly and without prompts during the probe trial.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) All other teaching trials for a given target: Same as above except that participant used one prompt level lower (less intrusive) than the prompt level used to bring about the correct response in the previous teaching trial.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Removed cards (following an error response)</th>
<th>Removed all of the instructional materials on the table immediately following an error response.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Flashcards were presented in same order as they were prior to the error.</td>
<td></td>
</tr>
<tr>
<td>(b) Flashcards were even spaced.</td>
<td></td>
</tr>
<tr>
<td>(c) All of the flash cards were presented equidistant from the participant.</td>
<td></td>
</tr>
<tr>
<td>(d) All three flashcards were presented at the same time.</td>
<td></td>
</tr>
<tr>
<td>(e) No other materials were located in the instructional area in front of the participant on the table (e.g., toys).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Represented materials (following an error response in the probe phase only)</th>
<th>Materials were presented in the same manner as they were prior to the error.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Same as “delivered appropriate instruction” except that the target item presented was the same as in the instruction delivered prior to the error response.</td>
<td></td>
</tr>
<tr>
<td>(b) One item (or target set) was placed in front of the participant and the other identical item (or target set) was placed in front of the participant.</td>
<td></td>
</tr>
<tr>
<td>(c) No other materials were located in the instructional area in front of the participant on the table.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Represent instruction (following an error)</th>
<th>Provided an additional prompt that was one level higher (more intrusive) than the previous prompt attempted just prior to the occurrence of the error.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Same as “delivered appropriate instruction” except that the target item presented was the same as in the instruction delivered prior to the error response.</td>
<td></td>
</tr>
</tbody>
</table>
Table 1 - continued

<table>
<thead>
<tr>
<th>Correctly recorded data</th>
<th>(a) Probe trials: The target listed on the data sheet matched the target requested in that trial and the prompt level recorded matched the final prompt level required to bring about the correct response in the trial</th>
<th>(b) Teaching trials: In addition to the above, “correct” was recorded if the confederate responded correctly (with or without prompts) on the first attempt, or “error” was marked if the confederate engaged in an error response (with or without prompts) on the first attempt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not provide tangible reinforcements (probe trials only)</td>
<td>Did not provide a tangible reinforcer or praise at any point during the probe trial, even if the confederate responded correctly (with or without prompts)</td>
<td></td>
</tr>
<tr>
<td>Conducted probes of all three targets</td>
<td>One trial of each of the targets was conducted in the first three trials of the session</td>
<td></td>
</tr>
<tr>
<td>Did not present across three consecutive teaching trials</td>
<td>Did not present any one of the target items in the same target across three consecutive teaching trials</td>
<td></td>
</tr>
<tr>
<td>Conducted all 3 teaching trials of all 3 targets</td>
<td>Each target was presented exactly 3 times during the teaching trials portion of the session, regardless of the order of presentation, meaning that exactly nine teaching trials were conducted</td>
<td></td>
</tr>
</tbody>
</table>

Participants were also given a short quiz containing fill-in-the blank and short-answer questions (see Appendix I) covering material in the self-instruction manual to determine their level of knowledge of DTT after they had read the manual. The quiz was scored immediately following the participants’ completion by the
experimenter. Each quiz was worth 20 points and a score of 90% correct or higher was considered passing.

**Interobserver Agreement**

Interobserver agreement (IOA) of two independent observers was assessed for participant performance for at least 28% of sessions using the point-by-point method (\( \frac{\# \text{ of agreements}}{\# \text{ of agreements} + \# \text{ of disagreements}} \times 100\% \)). Agreement of 80% or above was considered acceptable. Before IOA was assessed, a data collector and the experimenter practiced scoring a videotaped baseline session of one of the participants until at least 90% agreement for one trial block was achieved. Agreement was defined as both primary and secondary data collectors scoring "C", "I," or "N/A" for the same item following independent observations of the behavior in question. Disagreement was defined as two data collectors responding differently for the same item following independent observations of the behavior in question. For Lisa, Donald, and Theresa, IOA was assessed during 35.7%, 38.5%, and 28.6% of sessions with mean IOA scores of 96.2% (range, 92.5% to 98.2%), 96.4% (range, 93.3% to 97.6%), and 89% (range, 84.7% to 94%), respectively. Interobserver agreement was assessed for 46.7%, 38.9%,
and 30% of sessions for Michael, Heather, and Donna with mean IOA scores of 91.7% (range, 81.5% to 96%), 94.3% (range, 90.5% to 97.1%), and 89.5% (range, 80.1% to 96.3%), respectively.

The point-by-point method was also used to assess IOA for 70% of all of the sessions in which confederate behaviors (see below) were assessed, with an overall mean of 97.9% (range, 89.4% to 100%). Agreement of 80% or above was considered acceptable. For Lisa, Donald, and Theresa, IOA was assessed for 50%, 40%, and 100% of sessions in which confederate behaviors were assessed with mean IOA scores of 100%, 100%, and 92.5% (range, 89.4% to 98.1%), respectively. Interobserver agreement was assessed for 60%, 100%, and 66.7% of sessions in which confederate behaviors were assessed for Michael, Heather, and Donna with mean IOA scores of 98.1% (range, 97.1% to 100%), 99% (range, 96.2% to 100%), and 99.5% (range, 99% to 100%), respectively.

Confederate Behaviors

Confederate behavior scores were calculated to determine the accuracy with which the confederate responded according to the script assigned for that DTT session. Data were collected using a checklist of 1 of 5
possible scripts (see Appendix G) of confederate behaviors (see Table 2). Confederate behavior was scored by dividing the number of correct steps by the total number of correct and incorrect steps and converting the resulting ratio to a percentage. A mean accuracy score of 80% or above was considered acceptable. For Lisa, confederate data were collected in 28.6% of sessions with a mean accuracy of 92% (range, 84.9% to 100%). Data were collected for 38.5% of Donald's sessions with a mean accuracy of 99% (range, 94.9% to 100%). For Theresa, these data were collected for 28.6% of sessions with a mean accuracy of 84% (range, 56.25% to 100%). Data for were collected for 33.3% of Michael and Heather's sessions with mean accuracies of 96.6% (range, 88.2% to 100%) and 100%, respectively. Finally, confederate data were collected for 30% of sessions for Donna with a mean accuracy of 94.2% (range, 87.9% to 100%).

Procedures

Training Structure

A sequential analysis of the independent variables was conducted to determine the most efficient way to train novice instructors. Each intervention phase was kept in place until either the participant met the
mastery criterion or until data were stable according to visual inspection. Phases were ordered according to the efficiency of intervention. For example, a self-instruction manual is both cost and time efficient; therefore, it was used in the first intervention phase. Each participant received only the interventions that were necessary to master the steps of DTT. If a participant failed to master the steps to DTT after being exposed to the first intervention, he or she received the second intervention. If the participant failed to master DTT following the second intervention, he or she moved on to the third, and so on. At whatever point the participant reached mastery, he or she then moved on to the generalization task and finally follow-up assessment.

**Use of Confederates**

For each session, a confederate learner (the author) was used in place of a child with autism in order for the participant to practice his or her DTT skills. This ensured that each participant received a similar training experience. A script was provided to the confederate using a laptop computer, prompting her to engage in five correct responses and seven error responses (two "incorrect" responses and one of each of the other types of responses) in semi-random order across trials. When an
error response was scripted, the confederate was engaged in that particular error response each time the trial was represented until the participant (a) provided the prompt level indicated in the script, (b) provided a more intrusive prompt than the one indicated in the script, or (c) the participant delivered the instruction a total of four times for a given trial. Confederate responses are defined in Table 2.

Table 2

Definitions of Each Confederate Response

<table>
<thead>
<tr>
<th>Confederate Response</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct (C)</td>
<td>Selected (with or without prompts) the flashcard that corresponded with the instruction provided and extended arm with picture in hand toward the participant</td>
</tr>
<tr>
<td>No response (NR)</td>
<td>Did not respond to the flashcards at all, and if a prompt resulted in the confederate touching a flashcard, then the confederate must quickly moved her hand away</td>
</tr>
<tr>
<td>Wrong (W)</td>
<td>Immediately selected a flashcard other than the one indicated in the instructions provided, extended arm with flashcard in hand towards the participant without ever coming into contact with the other flashcards</td>
</tr>
<tr>
<td>Scroll (S)</td>
<td>Touched a flashcard other than the one that was indicated in the instructions provided, then selected the flashcard that corresponded with the one indicated during the instruction, and extended arm with flashcard in hand towards the participant</td>
</tr>
<tr>
<td>Select correct and hold (SCH)</td>
<td>Selected (with or without prompts) the flashcard that corresponded with the instruction provided, but failed to extend arm with picture in hand toward the participant.</td>
</tr>
</tbody>
</table>
Table 2 - continued

Select correct Selected (with or without prompts) the flashcard and throw (SCT) that corresponded with the instruction provided, and then tossed the card towards the participant.

Select two Selected (with or without prompts) the flashcard that corresponded with the instruction provided plus an additional flashcard, and extend arm with both pictures in hand toward the participant.

Experimental Design

A nonconcurrent multiple-baseline design across participants was used to evaluate the effects of the different training interventions. Three different staff training interventions were implemented across three different phases. These included manual-based self-instruction, video-based instructions and modeling, and performance feedback. Participants progressed through each intervention as needed, with phase changes occurring after performance for a given participant was considered stable according to visual inspection of the data path depicted in a line graph.

Baseline

Participants were provided with a data sheet (Appendix D) to record the responses of the confederate, a 1-page written description of a discrimination training program (Appendix E), instructional stimuli, and mock reinforcers. Participants had up to 10 min to review these materials before the experimenter gave the
following instruction, "Use these materials to teach the targets listed on the program sheet to the person sitting across from you. The toys in the basket are the mock preferred items of the person you are teaching. Just try your best." When a participant indicated that he was ready or after 10 min had elapsed, the participant was asked to conduct DTT with the confederate. The participant did not have access to the 1-page instructions during the session. After one trial block (12 trials) had been completed or 10 min had elapsed, the session was terminated. No feedback was provided regarding participant performance with the confederates. When participants asked questions about the implementation of DTT, the experimenter explained that, "Unfortunately, I cannot answer any questions at this time, but you should just do the best that you can with the materials that you have". The confederate followed 1 of 5 possible scripts (Appendix G), performing some trials correctly, and making specific errors on other trials then engaging in the correct response after a certain prompt level had been provided or after the instruction had been provided 4 times for a given trial. Participants received a short break between each DTT session.
Self-Instruction Manual

Following baseline, participants were provided with a 53-page self-instruction manual (modified from Fazzio & Martin, 2006), a notebook, a highlighter, and a pen. The experimenter gave the instruction, "You will be given up to two hours to study the discrete-trial teaching material in this manual and master the study guide questions at the end of each section. When you are finished reviewing the manual, you will be asked to take a quiz over the material as well as demonstrate what you have learned with an actor. Please do your best to master the material in the manual. You are not required to take notes, but you are free to do so, and you may also mark on the pages of the manual as needed. I will check on you approximately every 30 min, and feel free to let me know if you need to take a break to use the restroom or get a drink." Next, the participants were asked to take a quiz after they had indicated that they had finished reviewing the materials or after two hours had expired. No time limit was provided for the quiz; however, most participants completed the quiz in approximately 20 to 30 min. After the experimenter scored the quiz, she corrected any quiz errors and reviewed them with the participant. No other material was reviewed and no
participant questions were answered. The participant was not allowed to review the self-instruction manual at any other point in the study.

Following the quiz, participants were asked to demonstrate what they had learned with a confederate. They were provided with the same materials and instructions that were provided in baseline and were given the option to review the materials for up to 10 min prior to implementing DTT a confederate. The participant did not have access to the 1-page instructions during the session. If the participant reached mastery, he or she moved into the generalization phase. Participants who did not reach the mastery criterion moved to the next intervention phase. The participants were not allowed to review their instruction manuals or notes after the quiz had been taken and no feedback was provided regarding their performance with the confederates.

**Manual revisions.** Although the current manual was modeled after and shares some features with Fazzio and Martin (2006), one primary difference in the current manual is that all information that was not directly relevant to the implementation of DTT was omitted from the manual. For example, definitions of behavior-analytic terms that were incorporated in the Fazzio and Martin
(2006) manual such as contingency, extinction, and punishment were excluded from the current manual, not because these are unimportant terms, but because the understanding of these terms was not vital to correct implementation of DTT. When behavioral terms were necessary, they were defined in very brief, common language. Also, the Fazzio and Martin (2006) manual describes multiple prompting and prompt fading methods including most-to-least, graduated guidance, time delay, and the use of physical, verbal, and model prompts. Depending on the task being implemented, the instructor was required to use one or combined prompt-fading strategies (e.g., graduated guidance plus time delay). In the current manual, only one prompt fading strategy (i.e., most-to-least) was described, which only required the participant to learn how and when to implement three types of prompts. Pictures depicting each type of prompt were included in the manual to further illustrate how the prompts should be implemented. One limitation of the current manual was that it does not include any information on prompting or prompt fading strategies for tasks that require vocal responses. While the Fazzio and Martin (2006) manual provides some information on prompting strategies for vocal targets, participants of
the studies that utilized this manual or the revised manual (Fazzio & Martin, 2007) were never required to use DTT to teach vocal tasks, so it is not clear whether the information provided in the either of the Fazzio and Martin manuals would be sufficient to teach instructors to accurately implement DTT with vocal tasks.

Another difference between the two manuals is that the current manual provides symbol prompts throughout the manual to encourage the reader to either carefully review a certain section (e.g., ?) or practice a certain skill (e.g., $\Rightarrow$). For example, participants are encouraged to follow along with an example in the manual by completing a data sheet, and a few pages later an entire completed data sheet was provided in the manual for comparison. The last chapter of the current manual provided a step-by-step example of an entire trial block for the "discriminating animal flashcards" task. If the participant followed along with this section, he or she would have correctly practiced each step of DTT for an entire trial block, including how to respond to each type of error response that would be presented by the confederate during a real DTT session. The current manual also used examples from only one type of task (i.e., discrimination) throughout the manual, where as Fazzio
and Martin (2006) included examples from a variety of tasks (e.g., eating with a spoon, answering wh-questions, identifying objects by function). Although incorporating examples from various tasks may have aided in generalization in some studies (e.g., Arnal et al., 2007), it does not appear to have aided in the initial mastery of the DTT skills, and therefore various task examples were omitted from the current manual in exchange for a consistent set of examples used throughout the manual.

Another noteworthy difference between the two manuals was the order in which information was presented. The current manual presents information in the order in which the participant would need to apply it in a DTT session. For example, the first chapter "Getting Started" explains how a participant should set up his or her data sheet before beginning DTT. Fazzio and Martin (2006) do not introduce a data sheet until chapter 6 "Data Collection and Mastery Criterion," which may be due to the fact that data sheets presented in this manual need no preparation because the target items are already noted on the data sheet in the order in which they should be presented. Pre-determining the targets of a session is an uncommon clinical practice, and thus was not incorporated
in the current manual or the current study. From setting up the data sheet, the current manual moves into “presenting flashcards and securing attention.” This is also covered in the Fazzio and Martin (2006) chapter on managing antecedents, but is not presented until the last page of the chapter, following information about prompt strategies. In general, the flow of information in the current manual was presented in a more user-friendly manner. Other differences in the current manual was the use of large (16 pt) font, the use of pictures of the actual instructional stimuli in the examples, the inclusion question/answer sections where the answers are provided on the following page such that the reader can check the accuracy of his or her response, the inclusion of definitions of common error responses, especially error responses that share features with a correct response (e.g., scrolling), and the omission of reinforcer selection training. It has been the author’s experience that in clinical practice reinforcer selection and recognition of changes in learner motivation require a great deal of training and experience before mastery is acquired. This type of training goes beyond the scope of the current instructional manual and, therefore, was omitted. Rather, the focus in the present manual was on
the timing of the delivery and when to use or not use tangible reinforcers and praise. By organizing the manual in this manner, the primary focus remained on mastery of the mechanics of DTT, with the notion that once instructors become fluent in the basic steps, they will be able to more easily incorporate other important skills such as reinforcer identification without sacrificing the fidelity of the skills that they have learned.

Video Instructions and Modeling

At the beginning of this phase, participants viewed a 41-min instructional video created for the purpose of the study. A narration of each DTT step was provided in the video, explaining to participants which steps had been performed correctly and incorrectly. After the participants had viewed the video, they were asked to implement DTT with a confederate following a script. Participants were provided with the same materials and instructions that were provided in baseline and were given the option to review the materials for up to 10 min prior to implementing DTT with the confederate. The participant did not have access to the 1-page instructions while implanting DTT. If participant performance reached mastery, then the participant moved
into the generalization phase. Participants who did not reach the mastery criterion moved to the next intervention phase. The participants were not allowed to review the video after seeing it the first time, and no feedback was provided regarding his or her performance with the confederates.

**Performance Feedback**

This phase began with the experimenter reviewing common participant errors that were observed in previous sessions and answering any questions that the participant had regarding implementation of DTT. Next, the participant was asked to implement DTT with the confederate and was given the following instructions, "Next you will implement discrete-trial teaching just as you have in previous sessions, only this time, I will provide you with feedback as you go, telling you which steps you are performing correctly, and providing you with corrective feedback when you make an error. We will continue in this manner until you perform all of the steps correctly for all 12 trials." The experimenter followed 1 of 5 confederate scripts during each practice trial block. During the practice, when the participant made an error at any time, the experimenter provided immediate corrective feedback on that DTT step (e.g.,
"you presented the flashcards in the same order as the previous trial. Remember to present them in a different order for each trial."), and the participant was asked to re-present the trial. If the participant completed the trial with no errors, the experimenter provided the participant with praise. This continued until the participant completed one trial block of 12 trials with no errors. Each feedback session lasted approximately 10 to 15 min per trial block, and only two feedback sessions were required for Heather and Donna, while three sessions were required for Michael. After this, the participants were asked to implement DTT with the confederate again without feedback being provided. Again, participants were provided with the same materials and instructions that were provided in baseline and were given the option to review the materials for up to 10 min prior to implementing DTT with the confederate. The participant did not have access to the 1-page program instructions while implementing DTT. If participant performance reached mastery he or she moved into the generalization phase.
Generalization Probe with a Novel Program

This phase was similar to baseline, except that participants were given the stimulus set and the 1-page instructions on a skill acquisition protocol (teaching imitation with objects) that they had no experience implementing. The remaining materials provided were the same as those provided in baseline, and the experimenter provided the following instruction, “You will have up to 10 min to review the materials that you have been provided, and then you will be asked to conduct discrete-trial teaching to implement a different program than the one you have been practicing. I cannot provide you with feedback on your performance, but you should do the best that you can with the materials that you have.” The session was terminated after one trial block (12 trials) was completed or after 10 min had elapsed. No feedback was provided by the experimenter regarding participant performance during this phase.

Follow-Up Probe

Consistent with the clinical practice of the agency where the study took place, a follow-up probe session was conducted 3 to 5 days after each participant demonstrated mastery of DTT with a confederate to determine whether
their skills had maintained. Participants completed one trial block of DTT with a confederate, and the instructions and materials provided were the same as those provided in baseline. No feedback was provided by the experimenter regarding participant performance.
CHAPTER IV

RESULTS

Session-by-session results for Lisa, Donald, and Theresa are depicted in Figure 1. For Lisa, low and stable correct performance percentages were observed in the baseline condition, with a mean of 27% correct (range, 25.5% to 28.2%). During self-instruction, Lisa read and studied the manual for the full two hours allotted and she scored 90% (a passing score) on the quiz that followed. Lisa demonstrated immediate, substantial improvement in performance during the post-self instruction DTT sessions, and her performance gradually improved, eventually reaching the mastery criterion. Her mean performance during post self-instruction sessions was 86% (range, 76.1% to 94.2%). Lisa made multiple soft comments regarding her performance during and in between DTT sessions. For example, during one post-self instruction session, Lisa provided the confederate with an incorrect $S^0$, and then whispered to herself, "Shoot, I was supposed to ask for dog...um...ok." Although no data were collected on the frequency of such statements,
anecdotally, these comments and questions about performance increased following self-instruction. Performance while implementing a new program during the following generalization probe dropped to 75%, but increased to 90.5% during the follow-up session. Results for Lisa indicate that self-instruction resulted in mastery of the implementation of the program.

Results for Donald were similar to Lisa, except that Donald's baseline performance was somewhat higher, with an average of 49.1% correct (range, 45.3% to 52.6%). Donald used the full two hours to study the self-instruction manual and he scored 90% on the quiz that followed. His implementation of DTT also improved following self-instruction and he met the mastery criterion after six DTT sessions with a confederate, with a mean of 87.1% (range, 79.9% to 91.5%). Like Lisa, Donald also made comments regarding his performance during and in between the post self-instruction DTT session with a confederate. For example, following the completion of one DTT session, Donald said, "I already know that I did horrible on that one. I already know what I did wrong." His performance during the implementation of DTT with a new program during the generalization probe was quite high at 98.5%. This level of performance was
higher than his best performance during the post self-instruction DTT sessions. Upon analyzing the types of errors that Donald made during instruction, it was observed that Donald regularly presented the flashcards in the wrong order during DTT of the discrimination program. When implementing DTT with the imitation program, stimuli were not presented in a particular order, thus this particular presentation error could not be made when implementing the imitation program. His performance during the follow-up probe was slightly below the mastery level at 87.9%. Donald’s results indicate that self-instruction resulted in mastery of DTT steps with the discrimination program and generalization of performance to a novel program.

Theresa’s results were consistent with those of the previous two participants. Her performance during baseline was low, with slightly more variability than Lisa or Donald, with a mean performance of 24.6% correct (range, 13.64% to 31.58%). Theresa studied the self-instruction manual for two hours and scored 90% on the quiz that followed. Her performance saw the greatest improvement from baseline to self-instruction, reaching the mastery criterion in four post self-instruction DTT sessions, with an average of 93.3% (range, 88.4% to
97.2%). During the generalization probe with a novel program, Theresa performed 94.3% of the steps correctly, and in the follow-up probe, she also performed above mastery level at 96.2%. These results indicate that self-instruction resulted in the mastery of DTT with the discrimination program, as well as generalization of performance to a new program, and these results maintained over a short period of time.

Figure 1. Results for Lisa, Donald, and Theresa depicting the percentage of steps performed correctly while implementing DTT with a confederate. Note: Gen Task = Generalization Task; FU = Follow-Up.
The remaining three participants progressed through all intervention phases (see Figure 2). Michael's performance was low and stable during baseline with a mean of 27.9% correct (range, 26.8% to 29%). Michael studied the self-instruction for 1.5 hours, and scored 80% (below passing) on the subsequent quiz. His performance improved slightly in the post self-instruction DTT sessions, with a mean of 39.7% (range, 37% to 47%). Like the other participants, Michael made negative statements about his performance following self-instruction (e.g., "I did terrible on that one," "There sure was a lot to remember"). Michael's performance improved even more after watching the instructional video, which included modeling of DTT steps. In this phase, his mean performance was 79.5% (range, 68.1% to 86.9%). During the performance feedback phase, Michael received feedback during three trial blocks. His performance during post-feedback DTT reached masterly level in three sessions with a mean of 94.3% (range, 90.4% to 97.7%). His performance dropped substantially during the generalization probe with a score of 57.2%. His performance recovered during the follow-up probe with a score of 96.4%. The results indicate that performance feedback was necessary for Michael to reach the mastery
performance criterion for implementation of DTT with the discrimination program, and while these results maintained for the same program over a short period of time, generalization to a novel program was not demonstrated.

Heather’s performance was also low and stable during baseline with a mean of 36.8% correct (range, 34.3% to 40.7%). Heather studied the self-instruction for only 1 hour before indicating that she was ready to take the quiz, on which she scored 70% (below passing). Heather’s performance improved during the post self-instruction DTT sessions, with a mean of 72.3% (range, 60.7% to 77.9%). Following her viewing of the instructional video, Heather’s performance improved slightly compared to the previous phase, with a mean of 82.6% (range, 80.1% to 86.2%). Heather required feedback during two trial blocks during the performance feedback phase, after which she reached mastery with a mean of 96.1% (range, 95.1% to 98%) in only three post-feedback DTT sessions. Her performance maintained during the generalization probe with a score of 97.9% and the follow-up probe with a score of 94.4%. These results indicate that direct feedback was necessary for Heather to reach the masterly
performance criterion, and these results generalized to a new program and maintained over a short period of time.

Performance for Donna was low with little variability during baseline, and her mean performance score during this phase was 22.6% correct (range, 16.4% to 28.9%). Donna studied the self-instruction manual for the full two hours, and scored 67.5% on the quiz that followed. Her overall performance increased during post self-instruction DTT sessions, with a mean of 52.6%; however, her performance was quite variable with a range of 36.4% to 67.9%. After Donna observed the instructional video, her performance gradually increased to near-mastery level with a mean of 76.7% (range, 54.4% to 86.9%). Donna required direct feedback on her performance during two trial blocks, which resulted in her reaching the mastery criterion in three post-feedback DTT sessions with a confederate. Mean performance for this phase was 94.2% (range, 91.7% to 95.8%). Performance during the generalization probe dropped slightly to 87.3% and then rebounded during follow-up at 96.2%. These results indicate that performance feedback was necessary for Donna to reach the mastery performance criterion while implementing one protocol and these results maintained over a short period of time, although
generalization of mastery-level performance to a new program did not occur.

In summary, the performance fell well below the mastery criterion in the baseline phase for all participants, with averages below 30% for 4 of the 6 participants and below 50% for the other two. All six participants demonstrated improvement following self-instruction, with three of the participants (Lisa, Donald, and Theresa) reaching the mastery criterion in this phase. These same three participants scored 90% on the quiz following self-instruction, while the other participants, Michael, Heather, and Donna scored 80%, 70%, and 67.5%, respectively. These final three participants progressed through all of the remaining intervention phases, reaching mastery after receiving direct feedback on their performance during the final intervention phase. Half of the participants in the study performed at or above mastery level during the generalization protocol probe, and 4 of the 6 participants performed above mastery level during the follow up probe.
An analysis of the errors of the three participants who did not master the steps of discrete-trial teaching following self-instruction is depicted in Figure 3. Average percentages of error responses in the categories of "materials and instruction" and "responding to errors..."
were above 50% for all three participants. Michael engaged in the most error responses in all 4 out of 5 categories, while Heather engaged in the fewest error responses in 4 out of 5 categories. Although DTT errors varied for these three participants, each of them had similar errors on the post-self instruction quizzes. All three participants lost points on quiz questions that required them to identify instructor errors or describe how an instructor should respond in two DTT scenarios.

Figure 3. Average percentage of error responses by category observed during post-self instruction sessions for Michael, Heather, and Donna.
CHAPTER V

DISCUSSION

The purpose of the study was to evaluate a sequential analysis of staff training interventions, similar to those combined in BST packages (i.e., instructions, modeling, rehearsal and feedback) to determine which training component(s) are necessary to rapidly teach novice instructors to implement DTT. Another purpose was to introduce a more effective self-instruction manual and delineate a method of implementing an EL prompt strategy during DTT. According to the results of the study, the self-instruction manual alone was sufficient for half of the participants to correctly demonstrate the DTT protocol with a confederate. The other half of the participants reached mastery only after progressing through all intervention phases.

This first finding is surprising as it is inconsistent with previous research conducted in this area in which self instruction reliably resulted in only 20% to 25% of participants (Arnal et al., 2007; Fazzio et al., 2006; Theissen et al., 2009) reaching mastery-level
performance. This difference is likely due in part to the differences in the manuals that were utilized in the current study compared to the earlier manuals (Fazzio & Martin, 2006, 2007). As mentioned earlier, the current manual excluded unnecessary behavioral terminology, included instructions and examples of only one prompt-fading strategy (i.e., MTL) and one teaching protocol (i.e., discrimination of animal flashcards), incorporated multiple colorful illustrations as well as prompts to review material and practice, and included a detailed, step-by-step practice section, which walked the participant through three probe trials and nine teaching trials.

An interesting and reliable increasing trend of responding was observed in at one phase for all six participants (e.g., post-self instruction phase for Lisa, Donald, Theresa, and Heather, the feedback phase for Michael, and the video instruction for Donna). This may indicate that training resulted in an automatic punishment function for engaging in instructional errors. This hypothesis is supported by some of the statements that participants emitted during and after some DTT sessions (e.g., "I know what I did wrong").
Interestingly, quiz scores following self-instruction seem to correlate with success of the intervention. For example, all three participants who passed the quiz with scores \( \geq 90\% \) went on to reach mastery in post-self instruction DTT sessions. All three participants who failed the quiz with scores greater than 90% failed to reach mastery in this phase. This finding is important in that it indicates that not only is the current manual effective for some participants, it also provides a potential useful method of screening (i.e., quizzing) novice instructors to determine whether self-instruction alone will result in mastery of DTT skills.

In clinical practice, this might translate to all newly hired instructors receiving a self-instruction manual on their hire date and being quizzed over the information in the manual. Following the quiz, individuals who have passed would follow a different training sequence than those who did not pass the quiz, thus potentially saving training resources for an agency. The correlation between quiz scores and DTT performance following self instruction may be a result of participants practicing along with examples, either by physically engaging in the DTT steps or through imagining the steps covertly, and by rehearsing the steps of DTT privately by writing them out...
on the notepad provided or by saying them aloud or covertly. If the participants practiced along with all of the examples, then they had several opportunities to engage in all of the necessary DTT steps without errors. Praise statements such as, "You did it!" were embedded throughout the manuscript, which may have functioned as generalized reinforcers for some participants' behavior. If the participants rehearsed the steps of DTT, then this may have helped them generate additional verbal stimuli to respond to in the absence of the written instructions, thus increasing accuracy of implementation. An additional large-n study, analyzing the potential correlation between quiz scores and the accuracy of DTT following self-instruction would be necessary before quizzes are used as a means of screening new instructors for staff-training purposes. Furthermore, the psychometric properties of the quiz would need to be established.

Additionally, all three participants who failed the quiz lost points on similar questions (i.e., identifying instructor errors and describing how an instructor should proceed in two different DTT scenarios). It is possible that a revised self-instruction manual, incorporating more emphasis on these two areas may result in improved
quiz performance as well as DTT instructional performance.

Many human-service agencies create staff training modules based on requirements provided by different funding sources as well as the employee responsibilities for various positions. Strategies such as large-group lecture-style trainings, CD-ROM, or online training modules require varying levels of agency resources, and the effectiveness and efficiency of the training strategies are rarely analyzed. This study provides a framework for analyzing the on-the-job-impact of staff training interventions in a sequential manner, which may benefit both researchers and practitioners who may find this model useful when analyzing various procedural components or interventions in the future (e.g., DiGennaro Reed et al., 2010).

The present study also clearly demonstrated a method for teaching novice instructors to implement an EL prompt fading strategy as a part of DTT. Although many EL procedures are easy to implement when systematically incorporated into DTT they are somewhat more difficult. For example, when EL procedures are used, pre-session probes are often conducted in order to determine the starting prompt level for a given target before teaching
trials begin. The probes are conducted in a least-to-most fashion, meaning that first the learner is given a chance to respond independently, and if he or she does not respond or begins to engage in an error response, then this trial is represented with the addition of the least intrusive prompt, often a gesture prompt for motor tasks. If the learner does not respond or makes an error, then the trial is represented with a slightly more intrusive prompt. This continues until a prompt is provided that results in correct response from the student. When teaching trials begin, the last prompt used will be implemented for the first teaching trial for that specific target, and then prompts are faded across subsequent trials. This means that if an instructor is attempting to teach three targets in a given session, the prompt level used in a given trial for a given target may be different than the prompt level used with a different target. By contrast, when using least-to-most prompting during teaching trials, it is common practice to use the same prompt sequence for each DTT trial, regardless of the target. Least-to-most training trials resemble the probe trials interspersed throughout MTL training, which allows many more opportunities for the student to engage in error responses, but is less likely to result in
implementation errors on the part of the instructor. By comparison, MTL appears to be a more complex prompt fading strategy. Unfortunately, poor implementation of any prompt fading strategy might result in many problems for the learner (e.g., delayed acquisition, prompt dependency, increased errors) and it is likely that the more cumbersome a procedure, the greater chance for errors during implementation. Despite the difficulty of the DTT procedures defined in this study, all six participants reached mastery level, indicating that procedures were quite effective training strategies. This study may be used as a guide for practitioners who have little background in the implementation of EL strategies and/or who are responsible for training new staff to implement these procedures.

The results of the present study should be evaluated in light of several potential limitations. One limitation of the study is that while all of the participants mastered the mechanics of DTT, some of the participants lacked enthusiasm and variety when demonstrating praise. A future edition of the self-instruction manual and instructional video may need to emphasize this feature as a crucial feature of effective praise. Another potential limitation is that the DTT checklist used in this study
did not include physically blocking learner errors or observing the inter-trial interval; however, after reviewing a sample of sessions from each participant, it was observed that participants who failed to observe the inter-trial interval were also committing other instructional errors such as failing to provide a reinforcer or failing to remove the flashcards between trials. This may indicate that with this procedure the inter-trial interval is truly a byproduct of other DTT steps; therefore, it may not be necessary to teach or track that particular step alone. An additional limitation is that generalization was only evaluated with one novel program (e.g., imitation with objects) for only one probe session. Future research should evaluate whether these staff training procedures result in generalization across a variety of protocols. Despite these limitations, the current training protocol appeared to be effective and efficient in training clinically relevant teaching skills.

A confederate adult learner was used in this study to ensure that each participant received a similar training experience. Although all participants reached mastery-level performance with the confederate, it is unclear how the participants would have responded to
individuals with autism or confederates who more closely resemble learners with autism. For example, the confederate in this study did not speak or make noises during session and did not engage in any noncompliant, distracting, or otherwise challenging behaviors that instructors are likely to encounter during instructional sessions with learners with autism. In clinical settings, many new instructors have also never encountered an individual diagnosed with an ASD or other developmental disability; therefore, it is common clinical practice to gradually expose new instructors to individuals on the spectrum before requiring them to provide instruction. The number of these sessions may vary depending on the resources available and number of staff vacancies. Therefore, during training one might incorporate a series of confederate scripts that present increasingly difficult challenges to novice instructors before they are implement instructional strategies with learners with autism. This might slightly increase training time, but it might also reduce the number of resources allocated towards supervision and on-going training the long run if procedural fidelity is high. Future research might incorporate the use of more
realistic confederates in order to their effects on generalization to DTT with different learners.

Given the ubiquity of EIBI training needs and limitations, a number of additional studies are warranted in the area. Two of the most needed research areas are (a) the use of these staff training procedures to develop other job-related skills, and (b) modifying these procedures to increase effectiveness and efficiency. An example of using these strategies to teach a different skill would be to incorporate the use of similar procedures to teach EL prompt fading techniques for vocal responses, which cannot be prompted through physical guidance (e.g., tacting common objects). This is an area of great need in the practice of instructing vocal learners diagnosed with autism spectrum disorders, as learners often engage in behaviors such as stereotyped behaviors that can impede learning (Koegel & Covert, 1972). These strategies could also be used to teach more complex skills such as the implementation of reductive protocols. Because reductive protocols often include multiple treatment components and are individualized to meet the needs of the individual, staff training for these interventions can be quite challenging.
Future research should also include an evaluation of social validity. For example, participants could rate the likeability of various training components. In the current study, some of the participants made comments before, during, and after the post-self instruction DTT sessions. For example, one participant said, "I wish you could tell me if I’m doing this right." Anecdotally, fewer comments were observed in the other phases, including baseline. Participants who mastered the steps following self-instruction seemed relieved and somewhat surprised when they were finally provided feedback at the end of the study, indicating that they had reached masterly-level performance. This may be an indication that participants preferred some of the phases over the self-instruction phase; however, overall, all of the participants appeared to respond positively during all of the phases.

Future research could also attempt to improve upon the strategies used in this study the following ways. For example, after being hired, instructors could be given access to a training website, where they could download the self-instruction manual. After reading the manual, they could then take an online quiz, which could be automatically submitted to supervisors upon completion.
After the quiz was scored, the instructor would receive additional information on how to proceed. They may, for example, be instructed to access the instructional video, which could also be made available on the website. An online-instructional video could be enhanced by reducing the length of the video, include more examples of modeling, possibly with a child with autism, and could even an interactive component, requiring instructors to engage more with the training materials. After completing online training, instructors could be required to come in to clinic for further training and/or performance evaluation prior to being placed with an individual with autism. Future research could analyze the effectiveness of an online training course sequence to determine whether this would be an efficient and effective means of staff training.
Appendix A

Approval Letter from the Human Subjects Institutional Review Board
Date: June 30, 2009

To: Wayne Fuqua, Principal Investigator
    Jamie Severtson, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number

This letter will serve as confirmation that your project titled "An Analysis of Behavioral Skills Training to Teach Novice Instructors to Implement Discrete Trial Training with Confederates" has been approved under the expedited category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

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

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

Approval Termination: June 30, 2010
Appendix B

Consent Form Approved by the Human Subjects Institutional Review Board
Principal Investigator: Wayne Faqua, Ph.D.
Student Investigator: Jamie Severtson, M.A.
Title of Study: An Analysis of Behavioral Skills Training to Teach Novice Instructors to Implement Discrete Trial Training with Confederates

As an employee or volunteer of Trinity Services, Inc. Autism and Family Resource Center, you have been invited to participate in a research project entitled "An Analysis of Behavioral Skills Training to Teach Novice Instructors to Implement Discrete Trial Training with Confederates." This project will serve as Jamie Severtson's dissertation project for the requirements of the Ph.D in Psychology. This consent document will explain the purpose of this research project and will go over all of the time commitments, the procedures used in the study, and the risks and benefits of participating in this research project. Please read this consent form carefully and completely and please ask any questions if you need more clarification.

What are we trying to find out in this study?
Data produced by your participation will be used for research purposes. The purpose of this project is to (1) train instructors to implement discrete trial training, and (2) evaluate the success of the training by tracking instructor performance with confederates.

Who can participate in this study?
Employees and volunteers of Trinity Services, Inc who have little experience in providing discrete trial instruction may participate in this study. Individuals hired for the position of Home-Based Autism Instructor will participate in the training portion of this study as part of initial training for their position, however, the use of their data for research purposes is optional.

Where will this study take place?
This study will take place at the Autism and Family Resource Center located at 13318 W. Lincoln Highway, New Lenox, IL 60451.
What is the time commitment for participating in this study?
As a participant, you will be asked to attend 1 session lasting approximately 2.5 hours, and then approximately 10-15 sessions lasting approximately 60 minutes each, spread over the course of 1-2 months (with approximately 2 to 3 sessions scheduled per week) based on your availability.

What will you be asked to do if you choose to participate in this study?
The training will include a brief reading assignment, a quiz, video instruction/modeling, direct instruction, and performance feedback. During training sessions you will be taught to provide discrete trial training instruction and given opportunities to rehearse the skills that you have been taught. During some rehearsal sessions, you may be provided with feedback regarding your performance.

Your performance during sessions will be video-taped and you may be asked to view your video tapes during training.

What information is being measured during the study?
The accuracy of implementing the steps of discrete trial instruction will be measured during rehearsal opportunities throughout the study. Additionally, a quiz will be provided to measure the retention of information provided in the initial brief reading assignment.

What are the risks of participating in this study and how will these risks be minimized?
A potential risk of participating in this study is the use of my performance data against you, but the Executive Director of Behavioral Health and the Chair of the Human Rights Committee of Trinity Services, Inc. have signed a letter stating that these data will not be used against any participants.

To minimize this risk, you will be assigned a participant number that will be used on all datasets used to record your performance in an effort to reduce the chances of my performance data being identified. Only one document will link your name with your participant number, and it will only be accessible to the investigators. This document will be destroyed upon your completion of this study. At no time will your employment be jeopardized as a result of your performance during this training project. The only other potential risks to employees are those present in any educational setting. As in all research, there may be unforeseen risks to participants. If an accidental injury occurs, appropriate emergency measures will be taken, however, no compensation or treatment will be made available to me except as otherwise specified in this consent form.
What are the benefits of participating in this study?
A potential benefit of participating in this study is acquiring some of the skills needed to implement discrete trial training instruction.

Are there any costs associated with participating in this study?
There are no costs to participants involved with this study.

Is there any compensation for participating in this study?
Employees of Trinity Services will receive their normal wages while participating in this study, though no additional compensation will be provided.

Who will have access to the information collected during this study?
All of the information collected in this study will remain confidential. That means that no one other than the investigators will have access to any performance data (e.g., quizzes, graphs) or video tapes. Additionally, no names will be used if the results are published or reported at a professional meeting. The document linking the participant’s name with his/her participant number will be destroyed upon completion of the study. All documents and video tapes will be stored in a locked cabinet in a private office in the Autism Family Resource Center until the participant has completed the study, at which time all documents and video tapes moved to locked file cabinets in the Clinical Behavior Research Laboratory (Wood Hall - 1526) or Dr. Fuqua’s office (Wood Hall - 3700) at WMU where it will be stored for at least 3 years in and then destroyed.

What if you want to stop participating in this study?
If you are a Home Based Autism Instrctor, you may refuse to allow your data to be used for research purposes at any time during the study without prejudice or penalty by contacting Jamie Severson (269-873-1583) or Dr. Wayne Fuqua (269-375-5293). You will experience NO consequences professionally, academically, or personally if you choose to refuse your data to be used for research purposes. The investigator can also decide to stop your participation in the study without your consent. In this event, you will receive alternate training as determined by the Director of Home Based Services.

If you are a volunteer or hold a different position with Trinity Services, Inc., you may withdraw your participation at any time during the study without prejudice or penalty by contacting Jamie Severson or Wayne Fuqua. You can choose to stop participating in the study at anytime for any reason. You will not suffer any prejudice or penalty by your decision to stop your participation. You will experience NO consequences professionally, academically, or personally if you choose.
to withdraw from this study. The investigator can also decide to stop your participation in the study without your consent.

Should you have any questions prior to or during the study, you can contact the primary investigator, Dr. Wayne Fuqua at (269)-387-4474 or wayne.fuqua@umontana.edu, or you may contact the student investigator, Jamie Severson at (269)-873-1583 or severson2@umontana.edu. You may also contact the Chair, Human Subjects Institutional Review Board at 269-387-8295 or the Vice President for Research at 269-387-8298 if questions arise during the course of the study.

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

Your signature below indicates that you have read and/or someone has explained to you the purpose and requirements of the study and that you agree to allow your data from this project to be used for research purposes.

Signature ___________________________ Date _______________________

Permission Obtained By ___________________________ Date _______________________

WESTERN MONTANA UNIVERSITY
H. S. I. R. B.
Accepted for use as of this date: JUN 30 2009

HSIRB Chair
Appendix C

Site Approval Letter
Western Michigan University
Department of Psychology
Principal Investigator: Wayne Fuqua, Ph.D.
Student Investigators: Jamie M. Severtson, M.A., BCBA

Site Approval Letter and Consent for Research
Trinity Services, Inc.

This letter states that Jamie M. Severtson has been given permission to conduct her dissertation study entitled, “An Analysis of Behavioral Skills Training to Teach Novice Instructors to Implement Discrete Trial Training with Confederates” at the Trinity Services, Inc. Autism and Family Resource Center located at 13318 W Lincoln Highway, New Lenox, IL.

The nature of the study, resources required for the study and a schedule for study sessions has been discussed with me. Additionally, it has been explained that the staff training interventions that will be provided by the experimenter are similar to current staff training practices for novice instructors who are currently employed with Trinity Services, Inc. Staff participation in this study will not affect their employment status with Trinity Services, Inc., and direct supervisors of participating staff members will not have access to performance data collected over the course of the study. Contact information for Jamie M. Severtson, M.A., BCBA and Wayne Fuqua, Ph.D. have been provided to me.

I give my permission for this study to be conducted at the Trinity Services, Inc. Autism and Family Resource Center with novice instructors who are currently employed by Trinity Services, Inc.

Thane Dykstra
Executive Director
Behavioral Health Program
Trinity Services, Inc.

Steve Baker
Chair
Human Rights Committee
Trinity Services, Inc.
Appendix D

Discrete-Trial Teaching Data Sheet Completed by Participants
Discrete Trial Training Datasheet

Participant #  Session #  Phase:  Date:  

<table>
<thead>
<tr>
<th>Key:</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>GP = Gestural Prompt</td>
<td>PP = Partial Physical Prompt</td>
<td>FP = Full Physical Prompt</td>
</tr>
<tr>
<td>Ind = Independent Response (no prompt required)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Probes:** Check the prompt level required to bring about the correct response

<table>
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<th>□ GP</th>
<th>□ PP</th>
<th>□ FP</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>Target:</td>
<td>□ Ind</td>
<td>□ GP</td>
<td>□ PP</td>
<td>□ FP</td>
</tr>
</tbody>
</table>

**Trials:** Indicate whether the student made a correct or error response and check the highest prompt level used

<table>
<thead>
<tr>
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<th>□ PP</th>
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Appendix E

Discrimination Training Protocol: Animals
Discrimination Training Protocol: Animals

Objective: Student will select the correct animal picture from an array of three animal pictures and place it in the hand of the instructor following the an instruction like, “Give me __.” “Hand me the ___,” “Find the ___,” or “Where’s the ___.”

SD: Say, “Give me ______” (or something similar)

Response: Student selects a picture and extends hand (holding the picture) towards the instructor

Materials: Pen/pencil, datasheet, animal flashcards, clipboard (optional), reinforcers

Procedure:
1. Fill out the datasheet, indicating which order you will ask the targets (each target should be probed 1 time each and presented 3 times each during teaching trials)
2. Complete pre-session probes for each target item
   a. Randomly arrange the pictures in front of the student
   b. Secure the student’s attention
   c. Provide the instruction, “give me ___”
   d. Use prompts in a least-to-most fashion (as needed)
   e. Record the prompt level required to bring about the correct response on the datasheet
3. Complete teaching trials
   a. Randomly arrange the pictures in front of the student
   b. Secure the student’s attention
   c. Provide the instruction, “give me ___” + prompt (as needed)
      i. For the first trial of each target item, begin with the prompt level determined in baseline
      ii. Fade prompts in a most-to-least fashion
   d. Provide reinforcement for correct responses
   e. Record the student’s first response for that trial (correct or error)
   f. Record the prompt level required to bring about the correct response in that trial
4. If the student makes an error
   a. Remove the flashcards (very briefly)
   b. Arrange the flashcards in front of the participant in the same order
   c. Provide the instruction, “give me ___” + prompt (higher level than previous prompt)
   d. Provide reinforcement for correct responses
   e. Record the prompt level required to bring about the correct response
5. Present the next trial

Data Collection: See datasheet. Ignore gray areas on datasheet.

Target List: Cow
Dog
Bird
Appendix F

Imitation Training Protocol: Actions with Objects
Imitation Training Protocol: Actions with Objects

Objective: Student will imitate motor movements of the instructor following the instruction, “Do this.”

SD: Places 1 item (set of items) in front of yourself and an identical item (set of items) in front of student, and say, “Do this,” then immediately perform the action with object

Response: Student imitates the instructor’s movement (should be exact imitation or very close approximation

Materials: Two identical items (sets of items) of each of the targets listed below

Procedure:
1. Fill out the datasheet, indicating which order you will ask the targets (each target should be probed 1 time each and presented 3 times each during teaching trials)

2. Complete pre-session probes for each target item
   a. If the target requires an item (e.g., stack block, roll car), place one item in front of the child, and one identical item in front of the instructor.
   b. Secure the student’s attention
   c. Provide the instruction, “Do this” and then immediately engage in the target motor behavior
   d. Use prompts in a least-to-most fashion (as needed)
   e. Record the prompt level required to bring about the correct response on the datasheet

3. Complete teaching trials
   a. If the target requires an item (e.g., stack block, roll car), place one item in front of the child, and one identical item in front of the instructor.
   b. Secure the student’s attention
   c. Provide the instruction, “Do this” and then immediately engage in the target motor behavior, then immediately provide prompt (as needed)
      i. For the first trial of each target item, begin with the prompt level determined in baseline
      ii. Fade prompts in a most-to-least fashion
   d. Provide reinforcemnt for correct responses
   e. Record the student's first response for that trial (correct or error)
   f. Record the prompt level required to bring about the correct response in that trial

4. If the student makes an error
   a. Remove the items (if present)
   b. Represent the items for the same target (if necessary for that target)
   c. Provide the instruction, “Do this” and engage in the target behavior, then provide a prompt (higher level than previous prompt)
   d. Provide reinforcement for correct responses
   e. Record the prompt level required to bring about the correct response

5. Present the next trial

Data Collection: See datasheet. Ignore gray areas on datasheet.

Target List: * stack one block on top of another
* roll a car (forward ~ 3 inches)
* place one bowl inside of another
Appendix G

Confederate Scripts
Confederate Scripts

Instructions: Engage in the response indicated for each trial. On trials that require an error response, following the first error, continue to engage in that error until the participant either provides the prompt level indicated or provides the SD 3 more times.

Example:

Teaching trial 1: Scroll, Full Physical
Participant: “Give me cow” + points to the cow (Gestural Prompt)
Confederate: touches dog, then gives cow
Participant: “Give me cow” + picks up the confederates hand and moves it to the cow picture then let’s go
Confederate: picks up bird, puts down bird, then gives cow
Participant: “Give me cow” + picks up the confederates hand and moves it to the cow picture and physically prompts the confederate to pick up the cow picture and place it in her hand

Key: C = Select the correct card, S = Scroll - touch the wrong card and then give the correct card, S2 = Select 2 cards, SCH = Select the correct card and hold it, SCT = Select the correct card and toss it towards the participant, W=Select the wrong card, GP = Gestural Prompt, PP = Partial Physical Prompt, FP = Full Physical Prompt

<table>
<thead>
<tr>
<th>Script 1:</th>
<th>Script 2</th>
<th>Script 3</th>
<th>Script 4</th>
<th>Script 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Probes</strong></td>
<td><strong>Probes</strong></td>
<td><strong>Probes</strong></td>
<td><strong>Probes</strong></td>
<td><strong>Probes</strong></td>
</tr>
<tr>
<td><strong>Teaching Trials</strong></td>
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</tbody>
</table>
Appendix H

Self-Instruction Manual
Self-Instruction Manual: Introduction to Teaching Discrimination Skills to Children Diagnosed with Autism Using Discrete Trial Teaching & Errorless Learning

(Modified from Fazziio & Martin, 2006)
OVERVIEW OF MANUAL

This manual contains descriptions and examples of some of the concepts and basic skills that you will need in order to successfully conduct teaching trials with individuals diagnosed with an autism spectrum disorder using Applied Behavior Analysis (ABA). The approach that you will be learning is referred to as discrete-trial teaching (DTT) or discrete-trials training. While DTT can be conducted in a variety of ways, you will be using an errorless learning (EL) technique to reduce the errors made by the students (actors) that you will be working with.

You will be learning how to teach children to discriminate among pictures. Discrimination skills are very important to teach because they are the foundation for many other skills. Once you master the ability to use discrete-trials training and errorless learning to teach discrimination of animal pictures, you will be well on your way to being able to teach a variety of other skills to children with autism; however, you will need additional training in order to become a seasoned instructor.

To help you to master the DTT skills, study questions have been provided the end of each sub-section.

When studying this manual, you should proceed as follows:

- Read a sub-section
- Complete examples as indicated
- Answer each study question at the end of the subsection
- Memorize the answers to the study questions
- Practice by yourself (pretend) as indicated
- Proceed to the next sub-section

In two hours, you will be given a closed-book test to assess your mastery of the study questions. Then, you will be asked to attempt to demonstrate what you have learned with actor. As you are reading, when you see a ? next to the text, this means that the answer to a study guide question is in that block of text. When you see Pretend next to text, this means that you should practice your skills by pretending by yourself as indicated.
1.

GETTING STARTED

Before you start the session, *quickly* organize your materials. You should have three animal flashcards, a program sheet, and a datasheet in your folder. Begin by filling in the target blanks on the datasheet. Take out one of the practice datasheets, and follow along to practice.

Start with the blanks for the probes. You will probe each item **only one time**, so a different animal should be written into each blank, like this:

<table>
<thead>
<tr>
<th>Target: cow</th>
<th>Ind</th>
<th>GP</th>
<th>PP</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target: bird</td>
<td>Ind</td>
<td>GP</td>
<td>PP</td>
<td>FP</td>
</tr>
<tr>
<td>Target: dog</td>
<td>Ind</td>
<td>GP</td>
<td>PP</td>
<td>FP</td>
</tr>
</tbody>
</table>

Now fill in the blanks for the teaching targets. You will run **three teaching trials of each item**. When filling out the datasheet, follow these rules:

- Do not write the same item in more than two consecutive blanks (e.g., cow, cow, cow).
- Avoid writing the targets in the same order (e.g., cow, bird, dog, cow, bird, dog).
Follow the example below, and complete the rest of the datasheet. Make your datasheet look like this one:

<table>
<thead>
<tr>
<th>Discrete Trial Training Datasheet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pass no.</strong></td>
</tr>
<tr>
<td>Key: GP = Gestural Prompt</td>
</tr>
<tr>
<td><strong>Probes:</strong> Check the prompt level required to bring about the correct response</td>
</tr>
<tr>
<td><strong>Target:</strong> cow</td>
</tr>
<tr>
<td><strong>Target:</strong> bird</td>
</tr>
<tr>
<td><strong>Target:</strong> dog</td>
</tr>
</tbody>
</table>

**Trials:** Indicate whether the student made a correct or error response and check the highest prompt level used.

<table>
<thead>
<tr>
<th>Target: cow</th>
<th>□ Correct □ Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. dog</td>
<td>□ Correct □ Error</td>
</tr>
<tr>
<td>2. bird</td>
<td>□ Correct □ Error</td>
</tr>
<tr>
<td>3. cow</td>
<td>□ Correct □ Error</td>
</tr>
<tr>
<td>4. cow</td>
<td>□ Correct □ Error</td>
</tr>
<tr>
<td>5. dog</td>
<td>□ Correct □ Error</td>
</tr>
<tr>
<td>6. bird</td>
<td>□ Correct □ Error</td>
</tr>
<tr>
<td>7. dog</td>
<td>□ Correct □ Error</td>
</tr>
<tr>
<td>8. cow</td>
<td>□ Correct □ Error</td>
</tr>
<tr>
<td>9. bird</td>
<td>□ Correct □ Error</td>
</tr>
</tbody>
</table>
Study Questions
1. How many times should you probe each target item?
2. How many teaching trials should you conduct for each target?
3. Is it ok to list the same target three times in a row?

2.
PRESENTING FLASHCARDS & SECURING ATTENTION

Whether you are conducting probe or teaching trials, you must begin by securing the child's attention and presenting the flashcards approximately 1-2 seconds before you provide the instruction.

? Follow these guidelines when presenting the flashcards for a probe or a teaching trial:
- Always present all three flashcards for each trial
- Be sure that the flashcards are evenly spaced and in line with one another
  Good example:
  ![Cow] ![Dog] ![Bird]

  ![Bad example:
  ![Cow] ![Dog] ![Bird]

- Arrange the stimuli IN A DIFFERENT ORDER for each trial
- Be sure that the target of this probe is in DIFFERENT POSITION than the target in the previous probe.
  - For example, in this trial, cow is the target, and it is presented in the left position.
In next trial, bird is the target, so it SHOULD NOT be presented in the left position. Here are two appropriate options for presenting the flashcards in this trial:

**Good Examples:**

- Good Examples:
  - Cow
  - Bird
  - Dog

  or

  - Dog
  - Cow
  - Bird

These following arrays would be INCORRECT presentations for this trial:

**Bad Example:**

- Bad Example:
  - Cow
  - Dog
  - Bird
  - Same order as previous trial

**Bad Example:**

- Bad Example:
  - Bird
  - Dog
  - Cow
  - Target is in the same position on 2 consecutive trials

**Bad Example:**

- Bad Example:
  - Dog
  - Bird
  - Only 2 flashcards presented

Follow these guidelines when securing the child’s attention:

- Saying the child’s name (e.g., “Sally”)
- Saying “look” or “look at all the pictures”
Laying out the flashcards near you and then sliding them in all at once towards the child such that it grabs his/her attention.

Presenting the cards in front of the child and moving your finger along the front of the cards in one fluid motion back and forth, drawing attention to the cards without pausing at any one card. **DO NOT DRAW ATTENTION TO ANY ONE CARD** as this might accidently prompt the child to select that card. You might also say, "look" while doing this.

Presenting the cards in front of the child and using a full physical prompt, move the child’s finger along the front of the cards in one fluid motion back and forth, drawing attention to the cards without pausing at any one card. **DO NOT DRAW ATTENTION TO ANY ONE CARD** as this might accidently prompt the child to select that card. You might also say, "look" while you do this.
NOTE: You should only use ONE of these techniques per trial, and you should mix and vary the methods you use to secure the child's attention.

DO NOT DO THE FOLLOWING TO SECURE ATTENTION

- Touch each individual card
- Name each individual card
- Snap your fingers at the child
- Say his/her name repeatedly
- Repeatedly say any of the appropriate statements (e.g., "Sally. Sally.")

Study Questions
1. Be able to identify “good” and “bad” examples of presenting the flashcards.
2. Be able to provide and identify “good” and “bad” examples of securing the child's attention.

3. PRESENTING THE INSTRUCTION
   (DISCRIMINATIVE STIMULUS - SD)

The things (sights, sounds, smells, etc.) in our environment capable of affecting our behavior are called stimuli (plural of stimulus). When a specific set of stimuli are associated with a specific response, the stimuli are called Discriminative Stimuli (plural of stimulus) (SD). When implementing discrete-trials teaching, you should ONLY USE the SD listed on the program sheet. For example, when you are teaching children to discriminate pictures of animals, the SD is a combination of the pictures that you present as well as the instruction, “Give me
Other similar instructions are acceptable as well, just follow these guidelines.

- Be sure to keep the instruction brief
- Do not use additional descriptors (e.g., "Give me dog. He has a blue collar.")
- Do not use instructions like, "Touch the ___" or "Point to ___" because those instructions indicate that the child should do something other than place the card in the hand of the instructor.

The top of your program sheet might look like this:

**Discrimination Training Protocol: Animals**

**Objective:** Student will select the correct animal picture from an array of three animal pictures and place it in the hand of the instructor following an instruction like, "Give me ___", "Hand me the ___", or "Where's the ___".

**SD:** Say, "Give me _____" (or a similar statement)

**Response:** Student selects a picture and extends hand (holding the picture) towards the instructor

**Target List:** Cow  Dog  Bird

**DO SAY**
- "Give me cow"
- "Hand me dog"
- "Where's the bird"
- "Find the dog"

**DON'T SAY**
- "Touch the cow"
- "Point to the dog"
- "Tell me where the bird is"
- "Show me the little doggie. It's brown and has a tail and a blue collar."
Do not forget, this program requires that an array of three pictures always be presented. The instruction + the specific card that you are asking for = the SD for the response that you want to see.

**EXAMPLE**

Look at the examples below. Check the boxes of the trial in which the instructor presented the correct SD.

- **Box A**
  - Cow
  - Dog
  - Bird
  - "Give me dog"

- **Box B**
  - Bird
  - Dog
  - "Where's the dog"

- **Box C**
  - Bird
  - Cow
  - Dog
  - "Give me yellow birdie"

- **Box D**
  - Dog
  - Bird
  - Cow
  - "Hand me the cow"
Answers

In the above example, you should have selected boxes A and D.

Box A is CORRECT because all 3 flashcards were presented and the instruction was correct. In Box A the SD was: “Give me dog,” + the dog flashcard

Box B is INCORRECT because only 2 flashcards were presented

Box C is INCORRECT because the instruction included an adjective (yellow) and the target word was incorrect (birdie). A correct instruction would have been “Hand me the bird”

Box D is CORRECT because all 3 flashcards were presented and the instruction was correct. In Box A the SD was: “Hand me the cow,” + the bird flashcard

Study Questions
6. Define Discriminative Stimulus (SD).
7. Be able to provide and identify “good” and “bad” examples of instructions.
8. Be able to explain why the SD provided correct or incorrect.
CORRECT RESPONSES AND ERRORS

In general terms, behavior is anything that a person says or does. Another word for behavior is response. When you are teaching individuals with autism, the behavior that you are teaching is called the correct response because it is the only response that you want to see after you give an instruction. Any other type of response, or in some cases a non-response, is called an error.

When teaching animal discrimination, the correct response is counted when the learner (actor) selects the card that corresponds with the instruction provided by the instructor and then extends his/her arm towards the instructor while holding the card. The correct response MUST occur within 3 seconds of the instruction.

The correct response to “Give me cow” looks like this:
**Errors**

As stated above, an error response is anything that the learner (actor) does that is NOT the correct response. Later you will learn the error correction procedure to use when learner (actor) errors occur. Many different errors can occur. Here are some examples of common errors:

- **Scrolling:** The child touches the wrong picture, but then quickly selects the correct picture and extends it towards the instructor. This is an error because the goal is for the child to IMMEDIATELY select the correct item.

- **No Response:** The child fails to respond within 3 seconds of the instruction.

- **Select the wrong item:** The child selects a picture other than the one indicated in the instruction provided.

- **Select Correct and Hold:** This child selects the correct picture, but fails to extend it towards the instructor. The child might hold the card, play with the card, or sets the card back down.

- **Select Correct and Throw:** The child selects the correct picture, but then tosses it towards the instructor or across the table rather than handing it to the instructor.
Practice Examples:

Read the following scenarios and answer the questions.

1. The instructor places three animal cards evenly spaced in front of Sally (the learner), and says, "Give me cow." Sally selects the cow and holds it in her hands.
   
a. Did Sally make a correct response or an error? If she made an error, what kind?

   b. Did the instructor make any errors? If so, what were they?

2. The instructor places two animal cards evenly spaced in front of Sally, and say, "We're going to work on animals. First, give me the dog." Sally selects the dog and hands it to the instructor.
   
a. Did Sally make a correct response or an error? If she made an error, what kind?

   b. Did the instructor make any errors? If so, what were they?

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Answers:

1. The instructor places three animal cards evenly spaced in front of Sally (the learner), and says, "Sally, give me cow." Sally selects the cow and holds it in her hands.
   a. Did Sally make a correct response or an error? If she made an error, what kind?

   Sally did make an error. She did not extend the correct card towards the instructor. This error is "Select Correct and Hold."

   b. Did the instructor make any errors? If so, what were they?

   The instructor did not make any errors. The instructor correctly displayed the flashcards, secured Sally's attention (e.g., "Sally"), and then presented the instruction ("give me cow").

2. The instructor places two animal cards evenly spaced in front of Sally, and say, "We're going to work on animals. First, give me the dog." Sally selects the dog and hands it to the instructor.
   a. Did Sally make a correct response or an error? If she made an error, what kind?

   Sally engaged in the correct response!

   b. Did the instructor make any errors? If so, what were they?

   The instructor made three errors. First, he/she did not present all three flashcards. Second, he/she did not secure Sally's attention, and finally, his/her instruction was too lengthy. The only instruction that should have been provided was, "Give me dog," or something similar.
PROVIDING REINFORCERS FOR CORRECT RESPONSES

Our behaviors are affected by their immediate consequences. In everyday language, we say that rewards strengthen the behaviors that they follow. A positive reinforcer is a stimulus that, when presented immediately following a behavior, causes the behavior to be strengthened (more likely to re-occur). In other words, when a positive reinforcer immediately follows a behavior, that behavior is more likely to happen again and again. In general terms, positive reinforcers are things that individuals like or prefer. Candy, for example, is a reinforcer for many children. Affectionate pats and hugs, praise, nods and smiles (referred to as social reinforcers) are reinforcers for many individuals. However, just because an item or activity is preferred does not necessarily mean that it is a reinforcer. In order for something to be considered a reinforcer it must be presented following a behavior and that behavior must be strengthened or increase.

In future trainings, you may learn about other types of reinforcers (e.g., negative reinforcers) and how to identify reinforcers with children that you are working with; however, this is beyond the scope of this
Now, you are going to learn about proper reinforcement delivery. At some point, you may be asked to practice your skills with a trainer, and "mock reinforcers" will be provided for you to use.

**Delivering Reinforcement**

Sometimes and individual (actor) that you are teaching will engage in a correct response without any help (independently). Sometimes you might have to provide assistance (prompts) to help them make the correct response. When using an errorless learning approach, prompts are provided BEFORE a child has a chance to make an error. When a child engages in the correct response (i.e., no error has been made), the instructor should IMMEDIATELY provide the child with a tangible reinforcer (e.g., toy, snack) + enthusiastic praise (e.g., "Way to go!") "You did it! That is awesome!"). This is the case even when the child's correct response has been prompted. (Note: You will learn about prompts later in this manual.)

It is important to deliver the reinforcers IMMEDIATELY after the correct response and BEFORE YOU mark anything on the data sheet. If you wait to deliver the reinforcer, you might actually reinforce some other behavior that is happening (e.g., nose picking) that you do not want to see increase or strengthen. Also, remember to REMOVE reinforcers (e.g., toys) before you begin the next trial. If the child does not hand it to you when you ask or reach for it, just gently remove it.
Withholding Reinforcement

There are two circumstances under which you do not provide reinforcers.

- If a child makes an error (e.g., scrolling response), then you DO NOT PROVIDE REINFORCERS! No praise, no tangibles. Instead you will engage in the error correction procedure which you will learn about later.

- When you are conducting probe trial, you should NOT PROVIDE REINFORCERS. This means no praise and no tangibles.

Examples:

Read the examples of teaching trials below. THESE ARE NOT PROBE TRIALS. (Note: you will learn more about probe trials later)

For each example, answer the following questions:

- What did the instructor do right? If the instructor did something wrong, what should the instructor have done instead?

- Did the student make engage in a correct response or an error response?

1. The instructor places three animal cards evenly spaced in front of Sally (the learner), and says, “Sally, give me cow.” Sally selects the cow and holds it in her hands. The instructor says, “Woohoo! Super!!!” and hands Sally her favorite stuffed bear.
2. The instructor places three animal cards evenly spaced in front of Sally, and says, "Hand me the dog." Sally touches the cow, then selects the dog, and hands the dog picture to the instructor. The instructor gives Sally a piece of candy and says, "Wow, you’re really starting to get this! Give me a high five."

3. The instructor places three animal cards evenly spaced in front of Sally, and says, "Find the bird." Sally selects the bird and hands the bird picture to the instructor. The instructor indicates on the datasheet that Sally engaged in a correct and independent response, and then tells Sally, "Super job! Fantastic" and gives her one of her favorite musical toys to play with.

4. The instructor places three animal cards evenly spaced in front of Sally, and says, "Give me cow." Sally selects the cow and hands the cow picture to the instructor. The instructor says, "Way to go, superstar!"
5. The instructor places three animal cards evenly spaced in front of Sally, and says, "Where's the bird." Sally selects the bird and hands the bird picture to the instructor. The instructor says, "TERRIFIC!" and hands Sally her favorite toy bear.

> Answers:

1. The instructor places three animal cards evenly spaced in front of Sally (the learner), and says, "Sally, give me cow." Sally selects the cow and holds it in her hands. The instructor says, "Woohoo! Super!!!" and hands Sally her favorite stuffed bear.

- The instructor should not have provided praise or the bear. He/she should have begun the error correction procedure.
- The student engaged in an error – Select Correct and Hold.

2. The instructor places three animal cards evenly spaced in front of Sally, and says, "Look. Hand me the dog." Sally touches the cow, then selects the dog, and hands the dog picture to the instructor. The instructor gives Sally a piece of candy and says, "Wow, you're really starting to get this! Give me a high five."

- The instructor should not have provided praise or the bear. He/she should have begun the error correction procedure.
- The student engaged in an error – Scrolling.

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3. The instructor places three animal cards evenly spaced in front of Sally, and says, "Find the bird." Sally selects the bird and hands the bird picture to the instructor. The instructor indicates on the datasheet that Sally engaged in a correct and independent response, and then tells Sally, "Super job! Fantastic" and gives her one of her favorite musical toys to play with.

- The instructor forgot to secure Sally's attention, and the instructor should have IMMEDIATELY provided praise and the musical toy BEFORE collecting data.
- The student engaged in the correct response! ☺

4. The instructor places three animal cards evenly spaced in front of Sally, and says, "Give me cow." Sally selects the cow and hands the cow picture to the instructor. The instructor says, "Way to go, superstar!"

- The instructor provided praise but no tangible. The instructor should have provided both.
- The student engaged in the correct response.

5. The instructor places three animal cards evenly spaced in front of Sally, and says, "Where's the bird." Sally selects the bird and hands the bird picture to the instructor. The instructor says, "TERRIFIC!" and hands Sally her favorite toy bear.

- The instructor did everything right.
- The student engaged in the correct response.

☞ Take a moment to practice what you have learned so far with the materials that you have. Just pretend.
Study Questions
12. Define a positive reinforcer.
13. Identify and explain situations in which you would and would not provide praise + a tangible reinforcer.
14. How soon after a correct response should you deliver the reinforcer?
15. Should you remove the reinforcer (e.g., toy) before the next trial?

6.
PROMPTS AND PROMPT FADEING

If a child is unable to respond correctly to an SD, the teacher might provide some assistance to help the child do so. The assistance provided to increase the likelihood that a correct response will occur is referred to as a prompt. When teaching using an Errorless Learning (EL) technique during teaching trials (not probe trials), prompts occur just after or at the same time as the SD and before the child has a chance to respond incorrectly. Assistance that comes after a response has already occurred, is not a prompt, but rather a consequence. Prompts ensure that the correct behavior occurs following the SD and is reinforced appropriately, which will result in strengthening the correct response.

Types of Prompts

- Full Physical Guidance or Full Physical Prompt (FP)

Full Physical Guidance (also called a full physical prompt) consists of the instructor touching the child to guide him through the entire response. The entire response is prompted. The child does not independently engage in any part of the correct response. This type of
prompt can be fairly intrusive and often involves the teacher using one or both hands to guide the child to make the correct response. Sometimes, this is called "hand over hand" when the prompt involves the teacher using his or her hand(s) to carefully guide the child's hand to complete a correct response.

This is what a Full Physical Prompt looks like following the instruction. "Give me dog".

Partial Physical Guidance or Partial Physical Prompt (PP)

Partial Physical Guidance (also called a partial physical prompt) is less intrusive than the full physical prompt, and consists of the instructor starting out lightly touching the child to guide him or her appropriately through the first part of the response, but stops prompting at some point, such that the child completes the last part of the correct response independently.

This is what a partial physical prompt looks like following the instruction. "Hand me the cow."
Here's another example. This is a different style of a partial physical prompt looks like following the instruction, "Where's the dog."

BOTH TYPES OF PARTIAL PHYSICAL PROMPTS ARE CORRECT!

Gestural Prompts (GP)

Gestural prompts are even less intrusive than the partial physical prompt as they do not require physical guidance. Gestural prompts are certain motions that the instructor makes, such as pointing to the correct stimulus or making a motion directed toward the child without touching him or her.

This is what a gestural prompt looks like following the instruction, "Find cow."
Here is another example of a different gestural prompt following the instruction, "Show me the dog."

**BOTH TYPES OF GESTURAL PROMPTS ARE CORRECT!**

**Study Questions**

17. When does a prompt occur when you are using errorless learning?
18. Define full physical prompt, partial physical prompt, and gestural prompt.
19. Be able to identify all three types of prompts listed above and explain why the prompts are correct or incorrectly implemented.
Take a moment to practice what you have learned so far with the materials that you have. Just pretend.

7. PRE-SESSION PROBES

In a discrete-trials / errorless learning procedure, the teacher must first conduct one probe trial of each of the teaching targets to determine which prompt level to start with when he or she begins teaching trials.

1. Prepare the teaching materials and the datasheet as you learned how to do earlier in this manual.
2. Present the flashcards and secure the individual’s attention.
3. Present the instruction, “Give me ___” then allow the child 3 seconds to respond. Do not wait more or less time UNLESS THE CHILD BEGINS TO MAKE AN ERROR.
4. If the child...
   - Responds correctly after before 3 seconds expires
     - Pick up all of the flashcards
     - Record the response on the datasheet (Step 6)
     - Begin the next trial
   - Begins to make an error or completes an error OR
   - Does not respond within 3 seconds
     - Pick up all of the flashcards
     - Begin Step 5
5. Begin presenting prompts from least-to-most intrusiveness.

a. Re-present the flashcards in the exact same order and secure the child’s attention. Present the exact instruction again – an IMMEDIATE gestural prompt. If the child does not respond correctly to a gestural prompt or resists a gestural prompt, then move to next step (increasing the prompt level).

b. Re-present the flashcards in the exact same order and secure the child’s attention. Present the exact instruction again – a partial physical prompt. If the child does not respond correctly to the partial physical prompt or is resists the partial physical prompt, then move to next step (increasing the prompt level).

c. Re-present the flashcards in the exact same order and secure the child’s attention. Present the exact instruction again – a full physical prompt to bring about the correct response. Do not continue until you get the child to make a correct response.

d. Once the child engages in the correct response, move on to Step 6.

**DO NOT PROVIDE PRAISE OR TANGIBLE REINFORCERS DURING THE PROBE TRIALS!**

6. On the data sheet, record the prompt level that was required to bring about the correct response. If no prompt was required (i.e.,
the child responded correctly within 3 seconds of the original instruction), then mark □ Ind. Indicating an independent, correct response occurred. Your datasheet might look like this after you complete the probe trials.

### Target: cow

- Ind: □
- GP: □
- PP: □
- FP: □

### Target: bird

- Ind: □
- GP: □
- PP: □
- FP: □

### Target: dog

- Ind: □
- GP: □
- PP: □
- FP: □

7. Return to Step 1 to probe the other target items. After you finish probing the targets, you will begin conducting teaching trials.

**NOTE:** You should try to complete all of the probe trials as quickly as possible, aiming for no longer than 1 minute per probe.

**Pre-Session Probes Example**

- Take out a new blank datasheet and practice as you read. Just pretend.

You are teaching Sally to discriminate animal pictures from an array of three animal pictures when she hears an instruction like “Give me __.”

You are given this description of the program.
• Fill out the probe portion of the datasheet so that it looks like the one below.

<table>
<thead>
<tr>
<th>Target: bird</th>
<th>□ Ind</th>
<th>□ GP</th>
<th>□ PP</th>
<th>□ FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target: dog</td>
<td>□ Ind</td>
<td>□ GP</td>
<td>□ PP</td>
<td>□ FP</td>
</tr>
<tr>
<td>Target: cow</td>
<td>□ Ind</td>
<td>□ GP</td>
<td>□ PP</td>
<td>□ FP</td>
</tr>
</tbody>
</table>

Probe Trial 1: bird
• You arrange the stimuli and secure the child’s attention.

“Sally”

• Present the instruction for the first probe. “Give me bird.”
  o Wait 3 seconds for the child to respond.
    • The child did not respond, so you...
  o Pick up all of the flashcards
  o Present the flashcards in the same order and secure the child’s attention

“Look”

• Then, present same instruction, “Give me bird,” and IMMEDIATELY provide a gestural prompt.
  • The child responds correctly to your gestural prompt so you...

? o SAY NOTHING and pick up all of the flashcards.
  o Record GGP on the datasheet.
  o You have completed the first probe.
Probe Trial 2: Dog
  o Arrange the flashcards and secure the child’s

    “Look”

    ![Cow] ![Dog] ![Bird]

  • Present the instruction for the second probe. “Find the dog.”
    o Wait 3 seconds for the child to respond.
      • The child engaged in the correct response immediately following the instructions, so you...
    o SAY NOTHING and pick up all of the flashcards.
    o Record ✓Ind. on the datasheet.
    o You have completed the second probe.

Probe Trial 3: Cow
  o Arrange the flashcards and secure the child’s

    “Look at the pictures”

    ![Dog] ![Cow] ![Bird]

  • Present the instruction for the third probe. “Where is the cow?”
    o Wait 3 seconds for the child to respond.
      • The touched the dog picture (error), so you...
    o SAY NOTHING and pick up all of the flashcards.
    o Re-present the flashcards in the exact same order and secure attention

    “Sally”

    ![Dog] ![Cow] ![Bird]

  • Re-present the same instruction, “Where is the cow?” and IMMEDIATELY provide a gestural prompt
    o The child does not respond to the gestural prompt within 3 seconds so you...
• Re-present the same instruction, “Where is the cow?” and IMMEDIATELY provide a partial physical prompt
  - The child resists the partial physical prompt by pulling her arm away, so you...
• Re-present the same instruction, “Where is the cow?” and IMMEDIATELY provide a full physical prompt
  - The child completes the correct response with your assistance, so you.
• SAY NOTHING and pick up all of the flashcards.
• Record □ FP on the datasheet.
  - You have completed the last probe.
  - Your datasheet should look like this:

<table>
<thead>
<tr>
<th>Target: bird</th>
<th>□ Ind</th>
<th>□ GP</th>
<th>□ PP</th>
<th>□ FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target: dog</td>
<td>□ Ind</td>
<td>□ GP</td>
<td>□ PP</td>
<td>□ FP</td>
</tr>
<tr>
<td>Target: cow</td>
<td>□ Ind</td>
<td>□ GP</td>
<td>□ PP</td>
<td>□ FP</td>
</tr>
</tbody>
</table>

If your datasheet looks different, then practice the example again on a new datasheet and try to figure out how to correct your mistake.

Study Questions:
1. Why is it necessary to conduct pre-session probes?
2. Be able to list the steps of conducting pre-session probes.
3. Be able to complete the probe section of a datasheet.
4. Describe what to do when a child makes an error during a probe trial.
5. What is the order in which prompts are presented during probe trials (hint: least to most)
6. Should you provide praise during probe trials? What about tangible reinforcers?
7. Be able to demonstrate how you would present the flashcards in a different order with the target card being in a different location for each probe trial.
8. About how long should it take you to conduct the three probe trials?
CONDUCTING TEACHING TRIALS

Once probes have been conducted, you are ready to begin conducting teaching trials. Conducting teaching trials is very much like conducting probe trials, except that you will begin by providing the prompt level that was determined during the probe and then gradually decrease prompts over subsequent trials.

1. Prepare the teaching materials.
2. Place reinforcers out of reach, but within view of the child.
3. Present the stimuli & secure the child's attention.
4. Present the instruction & immediately provide the appropriate prompt. If this is the...
   - First teaching trial for this particular target, then...
     o IMMEDIATELY provide the prompt that was required in the probe trial for that particular target UNLESS no prompt was required.
     o If no prompt was required for this target in the probe trial, then allow the child up 1-2 seconds to respond to the instruction.
   - Second or third teaching trial for this particular target, then...
     o IMMEDIATELY provide the prompt that is ONE LEVEL LESS INTRUSIVE than the prompt that was
provided in the previous teaching trial. This is called PROMPT FADING.

- For example, if a full physical prompt (HFP) was required in the first TEACHING TRIAL for cow, then the next trial that cow is presented, you should immediately use a Partial Physical Prompt following the instruction because it is one level less intrusive than the full physical prompt.

- If no prompt was required for this target in the previous teaching trial, then allow the child up 1-2 seconds to respond to the instruction.

If the learner engages in ...

- An ERROR response, move to Step 5
- A CORRECT response, skip Step 5 and move right to Step 6

5. Complete the Error Correction procedure if the child engaged in an error response (if not, move to Step 6).

- Remove the flashcards for 1 second
- Represent the stimuli in the same order and secure the child’s attention
• IMMEDIATELY provide a prompt, increasing the intrusiveness by one level
  - No prompt → Increase to → GP
  - GP → Increase to → PP
  - PP → Increase to → FP
  - FP → provide a more secure FP

• If the child resists your prompt or makes ANOTHER error, complete the error correction procedure, increasing the prompt level each time, until the child engages in the correct response.

  Once the child engages in a correct response, move to Step 6.

6. Provide PRAISE + A TANGIBLE REINFORCERS immediately (within 1 second) following the correct response, even if that response was prompted. Even if that prompted response was part of the error correction procedure.

   BE SURE TO PROVIDE REINFORCEMENT FOR CORRECT RESPONSES BEFORE YOU RECORD DATA

7. On the data sheet, record

   - Whether the child’s first response was correct or whether an error was made (e.g., ☑ correct ☐ error).
   - Also, record the prompt level that was required to bring about the correct response ( ☐ GP ☑ PP ☐ FP ☐ Ind). If an error
occurred, you will be recording the prompt level required during the error correction procedure.

- If no prompt was required (i.e., the child responded correctly within 3 seconds of the original instruction), the mark [X] Ind. Indicating an independent, correct response occurred.
- Your datasheet might look like this after you complete the probe trials and the first three teaching trials.

Notes about the Error Correction Procedure
Despite the name “Errorless Learning,” student will still engage in error responses from time to time. For example, some students are resistant to physical prompts initially. When an error occurs, it is important NOT to provide the child with a great deal of attention. DO NOT provide praise tangible reinforcers immediately following an error. In fact, do not say anything at all. Instead you should simply follow the instructions above to bring about the correct response following an error response.

Notes about Prompt Fading:
The goal of teaching is to teach a child to respond appropriately to a variety of instructions without accompanying prompts. However, abruptly removing prompts often results in student errors. Student errors during training may result in the student errors later on, even after the skill has been technically “mastered” by the student. On the other hand, if prompts are not faded (removed) quickly enough, students may become dependent on the prompts to engage in a correct response.
Therefore it is important that the prompts be faded gradually, yet quickly as described in the procedures above.

**Accidental Prompts**

Sometimes during teaching sessions, an instructor might unknowingly provide an accidental prompt to a child. To avoid accidentally prompting a child you should follow these guidelines.

- Always look at the child when you deliver instructions, never look at the flashcards. You might accidentally look directly at the target that you plan on asking for.
- Maintain a neutral facial expression while delivering instructions. Only change your expression when you are providing praise. You can be very animated when providing praise.
- Keep the top of the table organized and display items so that they are arranged at equal distances from each other and from the child.
- Do not hold your hand out when you give the instruction.
- Do not use any of the unapproved methods of securing attention.
- Do not place one card out in front of the others when presenting the flashcards.
- ALWAYS pick up ALL of the flashcards between trials. Do not just leave them sitting out in between trials.
• ALWAYS remove the reinforcer from the child between trials to ensure that the child is paying attention when you give the instruction.

Review

• First, pre-session probes are conducted to determine the initial prompt level to be used during the first teaching trial.
• For the first teaching trial of a given target, use the same prompt level indicated in the probe trial of that target.
• In subsequent teaching trials, you will try to fade the prompt by trying to use a less intrusive prompt than the previous teaching trial.
• Avoid the accidental prompts.

NOTE: You should try to complete all of the teaching trials as quickly as possible, aiming for no longer than a total of 5 minutes to complete 9 trials.

<table>
<thead>
<tr>
<th>Study Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. True or False: Errorless learning means that children will not make an error during instruction.</td>
</tr>
<tr>
<td>10. When you present the first teaching trial of each target, how do you decide which prompt to use? Do you provide that prompt immediately or wait 3 seconds?</td>
</tr>
<tr>
<td>11. Be able to list the steps of conducting teaching trials.</td>
</tr>
<tr>
<td>12. During a teaching trial, if you provide the instruction “Give me dog,” and you immediately use a Gestural prompt which results in the child making a correct response, do you provide praise only or praise + a tangible reinforcer?</td>
</tr>
<tr>
<td>13. What would you do if a child engages in an error during a teaching trial?</td>
</tr>
<tr>
<td>14. Be able to describe the error correction procedure and recognize when it should be used.</td>
</tr>
<tr>
<td>15. During the error correction procedure, can you use praise? What about tangible reinforcers?</td>
</tr>
<tr>
<td>16. Be able to identify situations in which no reinforcement is provided, and situations when praise + a tangible reinforcer should be provided.</td>
</tr>
<tr>
<td>17. Be able to complete a data sheet.</td>
</tr>
</tbody>
</table>
Let's look at an example of some teaching trials:

Take out the datasheet on which you practiced taking data on probe trials.

- On this datasheet, a full physical prompt was required for the correct response on the probe trial, so the datasheet looks like this:

  Target: cow  □ Ind □ GP □ PP □ FP

- For the first teaching trial for cow, a Full Physical prompt should be provided immediately following the instruction. If the prompt is effective, and the child makes a correct response, then the datasheet will look like this for that trial:

  Target: cow  □ GP □ PP □ FP □ Ind

- For the next teaching trial for cow, a Partial Physical prompt should be provided immediately following the instruction. If the prompt is effective, and the child makes a correct response, then the datasheet will look like this for that trial:

  Target: cow  □ GP □ PP □ FP □ Ind
For the third and final teaching trial for cow, a Gestural prompt should be provided immediately following the instruction. However, if the prompt is not effective, and the child makes an error, then the error correction procedure must be used. If a Partial Physical prompt is effective during the error correction procedure, then, the datasheet will look like this for that trial:

<table>
<thead>
<tr>
<th>Target:</th>
<th>Correct</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. cow</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9.

MORE PRACTICE

Take out the first practice datasheet that you used to practice simply writing in targets. Practice all of the steps as they are written.

Probe Trial 1: Cow

- Arrange the flashcards and secure the child's attention.

  “Sally”

  ![Bird](bird.png)  ![Cow](cow.png)  ![Dog](dog.png)

- Present the instruction for the first probe. “Give me cow.”
  - Wait 3 seconds for the child to respond.
    - The child did not respond, so you...
  - Say nothing and pick up all of the flashcards
- Present the flashcards in the same order and secure the child’s attention

  “Look”

  ![Bird](bird.png)  ![Cow](cow.png)  ![Dog](dog.png)
• Then, present the same instruction, "Give me cow," and IMMEDIATELY provide a gestural prompt.
  o The child touches dog, but then gives you the cow pictures. This is an error, so you...
    - Say nothing and pick up all of the flashcards
• Present the flashcards in the same order and secure the child’s attention

“Look at the pictures”

```

dog

cow

```

• Then, present same instruction, "Give me cow," and IMMEDIATELY provide a partial physical prompt.
  o The child gives you the cow, so you...
    - Say nothing
    - Pick up the flashcards
    - Record the data. Your datasheet should like this:

```
Target: cow  □ Ind □ GP □ PP □ FP
```

Probe Trial 2: Bird

• Arrange the flashcards and secure the child’s attention.

“Look”

```

dog

cow

```

• Present the instruction for the first probe. “Where is the bird?”
  o You begin waiting, and the child responds correctly by handing you the bird
  o Say nothing
  o Pick up the flashcards
  o Record the data. Your datasheet should look like this.

```
Target: bird  □ Ind □ GP □ PP □ FP
```

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Probe Trial 3: Dog

- Arrange the flashcards and secure the child’s attention.

“Look here”

- Present the instruction for the first probe. “Hand me the dog.”
  - You wait 3 seconds, the child does not respond, so you...
  - Say nothing
  - Pick up the flashcards
- Re-present the flashcards, secure the child’s attention by moving your finger back and forth along the pictures, and say, “Hand me the dog” while providing a gestural prompt.

- The child hands you the flash card.
- You say nothing and pick up all of the flashcards
- Then, record the data. Your datasheet should look like this

| Target:  dog | ☐ Ind | ☑ GP | ☐ PP | ☐ FP |

Teaching Trial 1: Dog (continue practicing ☐)

- Before you begin this trial, you review the datasheet to determine which prompt level to begin with. Because this the first teaching trial of “dog,” you should begin with the same prompt level that you ended with on the probe trial for this target.
• Arrange your materials
• Secure the child’s attention
• Present a correct instruction for the target: dog ALONG WITH a Gestural Prompt (because this was the prompt recorded for the probe trial)
• The child responds correctly so you, provide praise + a favorite toy
• Record the data. The datasheet should look like this:

<table>
<thead>
<tr>
<th>Target: dog</th>
<th>Correct</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. dog</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GP</td>
<td>PP</td>
</tr>
</tbody>
</table>

• Gently remove the toy

Teaching Trial 2: Bird

• Before you begin this trial, you review the datasheet to determine which prompt level to begin with. Because this is the first teaching trial of “bird,” you should begin with the same prompt level that you ended with on the probe trial for this target. In this case, no prompt was required for the probe trial, so you should not begin with a prompt.
• Arrange your materials
• Secure the child’s attention
• Present a correct instruction for the target: dog, and then wait up to 3 seconds
- The child responds correctly after only 1 second so you, provide praise + a favorite toy

- Record the data. The datasheet should look like this:

  Target:  
  2. bird  
  □ Correct □ Error
  □ GP □ PP □ FP □ Ind

- Gently remove the toy.

**Teaching Trial 3: Cow**

- Before you begin this trial, you review the datasheet to determine which prompt level to begin with. Because this is the first teaching trial of "cow," you should begin with the same prompt level that you ended with on the probe trial for this target.

- Arrange your materials

- Secure the child’s attention

- Present a correct instruction for the target: cow ALONG WITH a Partial Physical Prompt (because this was the prompt recorded for the probe trial)

- The child pulls his hand away and grabs the wrong picture. This is an error response, so you
  - Say nothing
  - Pick up the flashcards
  - Represent the flashcards IN THE SAME ORDER
  - Secure the child’s attention
c. Represent the SAME INSTRUCTION that you used previously AND immediately provide FULL PHYSICAL PROMPT because this is the next higher level of prompt than you used previously.

- The child selects the cow picture and hands it to you as you are prompting him, so you
  
  c. Provide praise + a favorite toy
  
  c. Record the data. The datasheet should look like this:

  | Target: 3. cow | □ Correct | ☒ Error |
  |      | □ GP | □ PP | ☒ FP | □ Ind |

- Gently remove the toy

**Teaching Trial 4: Cow**

- Before you begin this trial, you review the datasheet to determine which prompt level to begin with. Because this is the second teaching trial of "cow," you should begin with one prompt level lower than the one you ended with on the first teaching trial for this target.

- Arrange your materials

- Secure the child’s attention

- Present an appropriate instruction for the target: cow ALONG WITH a Partial Physical Prompt (because this is one level lower than the prompt recorded for the first teaching trial)

- The child responds correctly, so you
- Provide praise + a favorite toy
- Record the data.

<table>
<thead>
<tr>
<th>Target: cow</th>
<th>Correct</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GP</td>
<td>PP</td>
</tr>
</tbody>
</table>

- Gently remove the toy

**Teaching Trial 5: Dog**

- Before you begin this trial, you review the datasheet to determine which prompt level to begin with. Because this is the second teaching trial of “dog,” you should begin with one prompt level lower than the one you ended with on the first teaching trial for this target. A gestural prompt was recorded for the previous teaching trial for dog, so in this case, you will not provide a prompt immediately.
- Arrange your materials
- Secure the child’s attention
- Present an appropriate instruction for the target: dog and begin waiting (up to 3 seconds)
- The child select the dog and the cow pictures. This is an error response, so you
  - Say nothing
  - Pick up the flashcards
  - Represent the flashcards in the same order
- Secure the child’s attention
- Present the SAME instruction as you just used previously ALONG WITH a Gestural Prompt (because this is one prompt level higher than you first attempted).

- The child selects the dog picture, but then begins to play with it. This is an error, so you
  - Say nothing
  - Remove the flashcards
  - Represent the flashcards in the same order
  - Secure the child’s attention
  - Represent the same instruction ALONG WITH a Partial Physical Prompt (because this is one level higher than the previous prompt)

- The child responds correctly, so you
  - Provide praise + a favorite toy
  - Record the data.

```
Target: 5. dog
☐ Correct ☑ Error
☐ GP ☑ PP ☐ FP ☐ Ind
```

- Gently remove the toy

Teaching Trial 6: Bird
Before you begin this trial, you review the datasheet to determine which prompt level to begin with. Because this is the second teaching trial of “bird,” you should begin with one prompt level lower than the one you ended with on the first teaching trial for this target. No prompt was necessary in the first trial, so in this case, you will not provide a prompt immediately.

- Arrange your materials
- Secure the child’s attention
- Present an appropriate instruction for the target (bird) and begin waiting (up to 3 seconds)
- The child selected the bird card and handed it to you after only 1 second, which is a correct response, so you
  - Provide praise + a favorite toy
  - Record the data.

<table>
<thead>
<tr>
<th>Target</th>
<th>Correct</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>bird</td>
<td>☒</td>
<td>☐</td>
</tr>
</tbody>
</table>

- Gently remove the toy.

**Teaching Trial 7: Dog**

- Review the datasheet to determine the beginning prompt level
- Arrange the flashcards
- Secure the child’s attention
• Present an appropriate instruction while providing a Gestural prompt because this is one level lower than the prompt that you recorded for the previous teaching trial for dog.

• The child selects the dog picture and hands it to you, so you
  o Provide praise + favorite toy
  o Record data

<table>
<thead>
<tr>
<th>Target: dog</th>
<th>☒ Correct ☐ Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>☒ GP ☐ PP ☐ FP ☐ Ind</td>
</tr>
</tbody>
</table>

• Gently remove toy

Teaching Trial 8: Cow

• Review the datasheet to determine the beginning prompt level

• Arrange the flashcards

• Secure the child's attention

• Present an appropriate instruction while providing a Gestural prompt because this is one level lower than the prompt that you recorded for the previous teaching trial for cow.

• The child touches the dog picture and then hands you the cow picture, so you
  o Pick up the flashcards
  o Represent the flashcards in the same order
  o Secure the child's attention
  o Represent the same instruction along with a Partial Physical Prompt.
• The child jerks his hand away and does not select a card, so you
  o Pick up the flashcards
  o Represent the flashcards in the same order
  o Secure the child’s attention
  o Represent the same instruction along with a Full Physical Prompt.
• The child hands you the picture of the cow while you are assisting him, so you
  o Provide praise + favorite toy
  o Record data

<table>
<thead>
<tr>
<th>Target: cow</th>
<th>Correct</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☑</td>
<td></td>
</tr>
</tbody>
</table>

• Gently remove toy

Teaching Trial 9: Bird
• Review the datasheet to determine the beginning prompt level, if a prompt is necessary.
• Arrange the flashcards
• Secure the child’s attention
• Present an appropriate instruction and begin waiting (up to 3 seconds) because no prompt was required in the previous trial.
• The child quickly selects bird and hands it to you, so you
  o Provide praise + favorite toy
- Record data

Target:

9. **bird**

- Gently remove the toy.
YOU DID IT! YOUR DATASHEET SHOULD LOOK LIKE THIS:

### Discrete Trial Training Datasheet

**Key:**
- GP = Gestural Prompt
- FP = Full Physical Prompt
- Ind = Independent Response (no prompt required)

**Probes:** Check the prompt level required to bring about the correct response

<table>
<thead>
<tr>
<th>Target</th>
<th>Ind</th>
<th>GP</th>
<th>PP</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>cow</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bird</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dog</td>
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<td></td>
</tr>
</tbody>
</table>

**Trials:** Indicate whether the student made a correct or error response and check the highest prompt level used

<table>
<thead>
<tr>
<th>Target</th>
<th>Correct</th>
<th>Error</th>
<th>Ind</th>
</tr>
</thead>
<tbody>
<tr>
<td>cow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ind</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ind</td>
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</tr>
</tbody>
</table>

You made it to the end! If you have any remaining time, please look over the manual and practice what you have learned. 😊
Appendix I

Quiz Over Self-Instruction Manual Material
1. What kind of prompt is this?  

2. What kind of prompt is this?  

3. Read the description of this probe trial:

   - The instructor arranges the stimuli like this
     
     ![](image1.jpg)

   - Then he says, "Hand me the bird."

What did the instructor do wrong?  

________________________________________________________________________  

________________________________________________________________________
4. Read the description of this teaching trial.

Trial 7

- The data from the previous teaching trial looks like this.

```
Target: 4. dog □ Correct □ Error
□ GP □ PP □ FP □ Ind
```

- The instructor presents the cards like this and says, "Look":

```
Cow  Bird  Dog
```

- Then, the instructor said, "Hand me the picture of the gray dog," and waited 3 seconds for the child to respond.

- The child responded correctly by picking up the picture of the dog and handing it to the instructor using one hand.

- The instructor marked the response on the datasheet.

- Then the instructor said, "FANTASTIC!" and gave the child a preferred toy to play with.

- The datasheet for this trial looks like this:

```
Target: 7. dog □ Correct □ Error
□ GP □ PP □ FP □ Ind
```

Describe everything that the instructor did wrong.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
5. Read the description of this teaching trial and answer the question(s) at the end.

Trial 8

- The data from the previous teaching trial for this target looks like this:

<table>
<thead>
<tr>
<th>Target</th>
<th>Bird</th>
<th>Correct</th>
<th>Error</th>
<th>GP</th>
<th>PP</th>
<th>FP</th>
<th>nd</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.</td>
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<td></td>
</tr>
</tbody>
</table>

- The instructor presents the cards like this, and says, "Janet."

- Next, the instructor says, "Give me bird," and before he could prompt a response, Janet selects the cow.

- The instructor says, "No Janet, the cow isn't right," and removes the cow picture. The remaining pictures look like this.

- Next the instructor said, "Give me bird," and waits 3 seconds for Janet to respond.

- Janet selects the bird and hands it to the instructor.

- The instructor says, "Way to go, Janet!" and give Janet a toy to play with.

On the next page, describe how the instructor SHOULD have conducted the trial from the point by the arrow all the way to the end of the trial. Be sure to complete the datasheet line for that trial.
Trial 8

- The data from the previous teaching trial for this target looks like this:

<table>
<thead>
<tr>
<th>Target</th>
<th>Correct</th>
<th>Error</th>
<th>GP</th>
<th>PP</th>
<th>FP</th>
<th>Ind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bird</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>148</td>
</tr>
</tbody>
</table>

- The instructor presents the cards like this, and says, “Janet.”

- Next, the instructor says, “Give me bird,” and before he could prompt a response, Janet selects the cow.

Begin describing how the instructor should continue.
6. Describe 3 types of errors that a child might make during instruction.
   a. 
   b. 
   c. 

7. Under what circumstances do you provide praise + toy?

8. Under what circumstance do you NOT provide praise OR a tangible reinforcer for a correct response?

9. List the three types of prompts discussed in order from MOST INTRUSIVE to LEAST INTRUSIVE:
   a. 
   b. 
   c. 

10. Why are pre-session probes conducted?
Appendix J

Discrete-Trial Teaching Data Sheet Used to Record Participant Behavior
### Discrete Trial Training Procedural Fidelity Checklist

**Phase:**  
- BL  
- SIM  
- VM  
- FB  
- GEN (prot)  
- GEN (aut)  
- FU

**Participant #:**  
**Date:**  
**Session #:**  
**Data Collector:**  
- Primary  
- Secondary

#### Pre-Session Instructor Checklist

1. Filled in the target correctly on the datasheet prior to probes.  
   - TOTALS: C  
   - IOA: D

#### Probes

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C=Cow, D=Dog, B=Bird</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>(Part)</strong></td>
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<tr>
<td><strong>(Part)</strong></td>
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<tr>
<td><strong>(Part)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Materials presented correctly</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>(Child)</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>Delivered an appropriate instruction</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>(Child)</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>Completed appropriate prompt sequence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. waiting 3 seconds to prompt unless error occurs</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>(Child) cards</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>b. responding to first error/no response: removed cards</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>(Child) cards</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>provided ONLY gestural prompt</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>b. responding to second error/no response: removed cards</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>(Child) cards</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>provided ONLY a partial physical prompt</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>b. responding to third error/no response: removed cards</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>(Child) cards</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>provided ONLY a full physical prompt</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>7. What prompt level was required to bring about the correct response? (DNP=did not provide effective prompt, though one was necessary)</td>
<td></td>
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<tr>
<td>8. Correctly recorded the prompt level</td>
<td></td>
<td></td>
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<tr>
<td>9. Did not provide tangible reinforcers OR praise</td>
<td></td>
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<tr>
<td><strong>TOTALS</strong></td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
</tbody>
</table>

#### Post-Probe Review

10. Participant conducted probes of all three targets.  
   - TOTALS: C  
   - IOA: D
### Teaching Trials

<table>
<thead>
<tr>
<th>Teaching Trials</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Fill in the order of the stimuli and circle the targeted item for this trial. e.g. C &gt; D &gt; B</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>2. Materials presented correctly</strong></td>
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<tr>
<td><strong>3. Secured child's attention appropriately 1 time</strong></td>
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<tr>
<td><strong>4. Delivered an appropriate instruction</strong></td>
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<tr>
<td><strong>5. Provided immediate and correct prompt level</strong></td>
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<tr>
<td><strong>c. Which of these prompts was used initially?</strong></td>
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<tr>
<td><strong>6. Correct use of reinforcers</strong></td>
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<tr>
<td><strong>7. Responding to Errors</strong></td>
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<tr>
<td>a. responding to first error/no response:</td>
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<tr>
<td>removed cards</td>
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<td>represent cards</td>
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<td>secure attention</td>
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<td>represent instruction</td>
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<tr>
<td>provided ONLY 1 level increased prompt</td>
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<tr>
<td>Which of these prompts was provided?</td>
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<tr>
<td>Correct use of reinforcers</td>
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<tr>
<td>a. responding to second error/no response:</td>
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<tr>
<td>removed cards</td>
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<td>represent cards</td>
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<td>secure attention</td>
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<td>represent instruction</td>
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<tr>
<td>provided ONLY 1 level increased prompt</td>
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<td>Which of these prompts was provided?</td>
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<td>Correct use of reinforcers</td>
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<td>a. responding to third error/no response:</td>
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<td>removed cards</td>
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<td>represent instruction</td>
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<tr>
<td>provided ONLY 1 level increased prompt</td>
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<td>Which of these prompts was provided?</td>
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<tr>
<td>Correct use of reinforcers</td>
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<tr>
<td><strong>8. What was the final prompt used to bring about the correct response? (DFP=did not provide prompt, though one was necessary)</strong></td>
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<tr>
<td><strong>9. Correctly recorded data</strong></td>
<td></td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>TOTALS</th>
<th>C</th>
<th>A</th>
<th>C</th>
<th>A</th>
<th>C</th>
<th>A</th>
<th>D</th>
<th>D</th>
<th>D</th>
<th>A</th>
<th>A</th>
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<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>D</td>
<td>D</td>
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<td>Teaching Trials</td>
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<tr>
<td>1. Correctly</td>
<td>Fill in the order of the stimuli and circle the targeted</td>
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<tr>
<td>item for this trial, e.g., C / O, B.</td>
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<td>(child)</td>
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<tr>
<td>2. Materials presented correctly</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<tr>
<td>3. Secured child's attention appropriately 1 time</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<tr>
<td>4. Delivered an appropriate instruction</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<tr>
<td>5. Provided immediate and correct prompt level</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<tr>
<td>6. Which of these prompts was used initially?</td>
<td>☐ GP ☐ CPP</td>
<td>☐ GP ☐ CPP</td>
<td>☐ GP ☐ CPP</td>
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<tr>
<td>7. Correct use of reinforcers</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<td></td>
</tr>
<tr>
<td>8. Responding to Errors</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<tr>
<td>a. responding to first error/no response:</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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</tr>
<tr>
<td>removed cards</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<tr>
<td>represent cards</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<tr>
<td>secure attention</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<tr>
<td>represent instruction</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>provided ONLY 1 level increased prompt</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Which of these prompts was provided?</td>
<td>☐ GP ☐ CPP</td>
<td>☐ GP ☐ CPP</td>
<td>☐ GP ☐ CPP</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Correct use of reinforcers</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
<td>☐ C ☐ O ☐ A ☐ D</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>a. responding to second error/no response:</td>
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<td>☐ C ☐ O ☐ A ☐ D</td>
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### Table of Teaching Trials

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*Note: The table contains data on correct use of prompts, provided prompts, corrected errors, represented responses, and prompted responses for different parts and trials of the teaching trials.*


Miller, U. C., & Test, D. W. (1989). A comparison of constant time delay and most-to-least prompting in teaching laundry skills to students with moderate


Handleman (Eds.), Preschool education programs for children with autism (2nd ed.) (pp. 23-39). Austin, TX: Pro-ed.


