The Effects of Video Modeling on New Staff Training
of Discrete Trial Instruction

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Tamarra Forbes

The Department of Counseling and Applied Educational Psychology

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Author: Tamarra Forbes

Department: Counseling and Applied Educational Psychology

Approved for thesis requirements of Master of Science Degree

Hanna C. Rue, Ph.D., BCBA-D

Karen E. Gould, Ph.D., BCBA

Lincoln Kamau, MS. Ed, BCBA
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by

Tamarra Forbes

B.A., University of Rhode Island

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Abstract

This study evaluated the effects of video modeling on new staff implementation of discrete trial instruction. Three new direct care staff were evaluated on target skills needed to correctly implement discrete trial instruction. A modified pretest/posttest design was used, and percent accuracy was calculated using a 10 skill checklist. During baseline participants performance averaged 60%, 40%, and 50% respectively. After video modeling, there was an immediate increase in percent accuracy for two of the participants. Performance feedback was provided to the third participant until stable responding was achieved. Results from the two week maintenance probe confirm the skills were maintained in the absence of video modeling. This data coincides with Catania et al., 2009 study in which video modeling can be an effective tool in training new staff on discrete trial instruction.
The Effects of Video Modeling on New Staff Training of Discrete Trial Instruction

Typically developing children continuously learn from their environment throughout their waking hours via exploration, creative play, modeling, conversation, and other such stimulation (Bredekamp and Copple, 1997). Unfortunately, children with autism tend to have little skill or inclination to learn in such ways. In addition, they often fail to understand communicative efforts made by adults attempting to help them learn (Spradlin & Brady, 1999). As a result, these children are likely to experience frustration and they may react to teaching situations with tantrums and other efforts to escape or avoid future failures (Smith, 2001).

Several studies have been conducted to determine the most effective teaching strategies for individuals with autism. According to Smith (2001), the most extensively studied approach is an Applied Behavior Analytic (ABA) procedure called “discrete trial training” (DTT). A discrete trial is a small unit of instruction (usually lasting only 5-20 seconds) implemented by a teacher who works one on one with a child. DTT is a method for individualizing and simplifying instruction to enhance children’s learning. Smith (2001), goes on to say that for children with autism, DTT is especially useful for teaching new forms of behavior (i.e., speech sounds, motor movements), and new discriminations (responding directly to different request). It can also be used to teach more advanced skills and manage disruptive behavior.

Although DTT has been proven to be an effective teaching method, there are some limitations. Firstly, the method must be combined with other interventions to enable children to initiate the use of their skills and display their skills across settings. Secondly, early in treatment, children with autism may require many hours of DTT per week. Lastly, to implement DTT effectively, teachers and staff must have specialized training (Smith, 2001).
Development of effective and efficient training methods to teach human service and educational staff to conduct DTT is of critical importance in an era of high levels of accountability in our educational systems. Well trained teachers and staff increase the likelihood that instructional curricula are implemented with a high degree of procedural integrity, which should result in greater educational success for the children served (Cantania, Almeida, Constant, & Reed, 2009). Unfortunately, there has been limited research on staff training of DTT.

Sarakoff and Sturmey (2004) used a behavioral skills training package to train 3 special education teachers to correctly implement DTT. During the first baseline session, the experimenter gave the teacher a written list of definitions of the components of DTT. The experimenter then instructed the participants to conduct DTT to the best of their ability. During instruction, the experimenter provided the participants with a written copy of procedures and reviewed each component. Next, the experimenter gave them a graph of their performance from baseline and the previous session’s data sheet. The experimenter gave feedback on the average baseline score and described their performance during the last session. In addition, the graphical representation of the participant’s previous performance was discussed. The experimenter provided each participant with descriptive spoken feedback immediately following their performance. Verbal feedback included positive comments on target components performed correctly and informative feedback on components that the teacher needed to practice. During modeling, the experimenter sat with the student and modeled three additional discrete trials. The experimenter modeled the specific components that had been previously incorrectly implemented. After training, all 3 teachers were able to correctly implement DTT to almost 100%. Results of this study confirm instruction, feedback, rehearsal, and modeling are an effective treatment package in training teachers on DTT.
Video modeling has been shown to be an effective method to teach staff to implement functional analysis sessions accurately (Moore & Fisher, 2007), to train respite care workers (Neef, Trachtenberg, Loeb, & Sterner, 1991), and for teaching a number of skills to individuals with autism.

Reed, Codding, Cantania, and Maguire (2010) examined the effects of individualized video modeling on the accurate implementation of behavioral interventions using a multiple baseline design across 3 teachers. The experimenter provided and verbally reviewed with each participant a written protocol detailing the steps of the intervention. Responses were reviewed immediately with teachers, and errors were corrected. Feedback was not provided during baseline sessions, and participants were told, “Do your best”. During the “individualized video modeling” (IVM) condition, each participant viewed an individualized instructional video that depicted a model demonstrating accurate implementation of all of the intervention steps with a student. During the “individualized video modeling plus performance feedback” (PF) condition, the experimenter provided verbal feedback about prior session performance before playing the video. Results of this study show treatment integrity improved above baseline levels; however, teacher performance remained variable. Once performance feedback was added procedural integrity increased to 100% for all participants, and correct implementation was maintained at a 1 week follow up. These findings support previous research illustrating the benefits of video modeling for procedural implementation (Catania et al., 2009).

Moore and Fisher (2007) conducted a study where lectures and two types of video modeling were compared to determine their relative effectiveness in training 3 staff members to conduct functional analysis sessions. All participants were asked to conduct the attention, demand, and play sessions of the functional analysis described by Iwata, Wallace, Kahng,
Lindberg, Roscoe, and Conners, (2000). Participant’s implemented conditions under both simulated (with an experimenter role playing the client) and natural conditions (with a real client). Training materials consisted of several components. Written materials included a description of a functional analysis in a format similar to that of the method section of a published article, combined with short protocols of each analysis condition. Lecture training included a PowerPoint presentation delivered by an experimenter that included the following topics: history and rationale of functional analysis, specific procedures, and example outcomes. Video modeling training consisted of videotapes depicting two experimenters, one playing the therapist in a functional analysis session and the other playing the client. During the natural baseline phase, participants implemented functional analysis conditions with an actual client. No feedback or participants questions were answered at this time. The simulated baseline phase was identical to the natural baseline, except that participants implemented conditions with simulated clients (experimenters). During Phase 1 training, all participants were exposed to lecture training (control) for one of the functional analysis conditions. Another condition was then randomly assigned to receive complete video modeling. The third condition was randomly assigned to receive partial video modeling. During Phase 2 training, the condition that received complete video modeling during Phase 1 was omitted if the participant reached mastery criterion. The condition that received lecture only training in Phase 1 was then exposed to complete video modeling, whereas the condition that received partial video modeling in Phase 1 remained in that training mode if the mastery criterion was not met. During phase 3 training, the condition that received complete video modeling during Phase 2 was omitted if mastery criterion was reached. The condition that received partial video modeling during Phase 2 was then exposed to complete
video modeling if mastery criterion was not met. Results of the natural baseline and follow-up probes suggest that skill acquisition generalized to settings that involved actual clients. The combined use of written materials and a lecture describing functional analysis methods produced moderate improvements in staff implementation of functional analysis sessions but did not produce mastery performance. Allowing participants to view a 5-min video with multiple exemplars of correct therapist responses resulted in consistent and marked improvements in performance each time this intervention was implemented. Therefore, the results of this study demonstrated that video modeling provided an effective training strategy, but only when a wide range of exemplars of potential therapist behaviors were depicted in the videotape.

Lastly, Cantania et al. (2009) conducted a study to assess the effectiveness of video modeling on accuracy of discrete trial instruction (DTI) with 3 new direct care staff. In a group format, the participants were provided with a brief explanation of the sections of a lesson plan; however, they were not given details about how to conduct DTI. The trainer gave the participants materials to conduct a teaching session and instructed the participants to do their best at teaching the primary author using the lesson plan as their guide. During each phase of the study, participants also conducted one supervised session with a student in which they conducted five trials of the same lesson plan. Participants were then asked to watch a video 7 minutes and 15 seconds in length which depicted two of the experimenters simulating a teacher and student in a discrete trial session. Generalization across tasks (receptive and expressive) without the use of the video model was assessed using single-session probes. Results indicate the participants were able to demonstrate high levels of implementation accuracy when different lesson plan tasks were implemented. During the 1 week follow-up probe, performances of the DTI skills were maintained in the absence of video modeling.
The purpose of the current study was to assess the effectiveness of video modeling on new staff training of DTT and replicate Catania et al. (2009).

Method

Participants and Setting

Participants included three newly employed staff who worked with children with Autism Spectrum Disorder (ASD) and other Developmental Disabilities (DD) within a private school. Sarah, who had an Associate’s degree in Psychology, was a 38-year old female with four years of experience with both individuals with ASD and with Applied Behavior Analysis (ABA). Jessica, who had a Bachelor’s degree in Psychology, was a 25-year old female with five years of experience with individuals with ASD and with ABA. Lastly, Pam was a 26-year old female with three years of experience with individuals with ASD and with ABA.

All sessions were conducted on Thursday evenings in a conference room in which there were a table, chairs, smart board and small kitchen area. All participants had conducted discrete trial sessions for at least 2 months prior to the study.

Materials

All participants were provided with letter identification cards, lesson plan, discrete trial data sheet and a pen. The lesson plan included the student’s name, IEP objective, IEP date, date the skill was introduced and mastered, teaching methodology, materials presentation, instructions/ S₀, stimulus prompting procedure, response prompting procedure, correction procedure, response definition, criterion for mastery, and plans for generalization.

Design and Measurement

A modified pretest-posttest design - was chosen for the study. Identical to Catania et al., 2009, each participant was scored on ten DTI skills (Figure 1.) The percentage of correct
teaching behaviors was calculated by dividing the total number of behaviors performed correctly by the total number of skills on the performance checklist, which was then converted to a percentage.

**Interobserver Agreement**

Interobserver Agreement (IOA) was collected by having a second observer collect data using the same measurement. Agreements and disagreements were determined using “interval by interval IOA”. The total number of agreements between the two observers was divided by the number of agreements and disagreements, and then multiplied by 100. IOA data were collected for 100% of the sessions with an average agreement of 98% for baseline, 90% for video modeling and 95% for maintenance.

**Procedure**

**Baseline.** During baseline, all participants were in a group. Each participant acted as both as both the student and teacher for three sessions. Participants were given a short review of the lesson plan, excluding any conversation on how to conduct discrete trial. Once materials were provided, each participant (acting as student) was instructed to teach (participant acting as student) with access to the lesson plan as their guide. Each participant was asked to randomly select wrong targets while acting as a student, and feedback was not provided at this time.

**Video Modeling.** In group format, each participant watched a 9 minute and 37 second videotape which depicted the experimenter and second observer simulating a teacher and student during a discrete trial session. During the video, the experimenter conducted three discrete trial sessions using a letter identification lesson which was identical to that used in baseline. During these sessions, the second observer selected the wrong target-behaviors at random. Within ten minutes after viewing the video, participants were asked to use DTT identically to baseline.
Maintenance

A two week maintenance probe was conducted to assess whether teaching behaviors were maintained over time in the absence of the video modeling.

Results

Figure 2 represents the percent accuracy on DTI for all participants during baseline, video modeling, and maintenance. During baseline, Sarah’s performance averaged 60 %, Jessica averaged 40%, and Pam averaged 50 % (respectively) on percent accuracy. Sarah and Pam exhibited high levels of accuracy once video modeling had been implemented, reaching 100 % accuracy after two sessions. Performance feedback (i.e., a correction procedure -for incorrect implementation of DTT) was provided to Jessica in an effort to reach 100 % accuracy. Once performance feedback was added for Jessica, all participants remained at 100% accuracy during maintenance probes.

Discussion

The results of this study were consistent with those of Catania et al.,2009- in which video modeling was shown to be a successful method to train new staff to correctly implement DTT.

Although the data did show positive outcomes, there were limitations to the study. Unlike Catania et al.(2009), there were no student probes conducted, due to student availability. In addition, staff availability and pre-set student schedules prohibited the experimenter from conducting expressive and receptive generalization probes. Furthermore, all data was collected on Thursday evening after 4 pm, which was an extended work day. With that said staff performance, could have been affected by a variety of outside factors. Lastly, staff were not provided with the random number generator, like those in Catania et al. (2009). Therefore no criterion was set as to how many errors the participant playing the student should have made.
Future research should look into comparing video modeling with other teaching methods, such as written instruction, or role playing. Future studies should also examine the amount of information being presented in the video. In addition, future research can examine how videos of different lengths can affect training of new staff implementation of DTT. Finally, future research can look until a video depicting and actual student and teacher, as opposed to two experimenters.
References


Discrete Trial Instruction Skills Checklist

1. Establish ready behavior.
2. Wait for ready behavior.
3. Present choices or stimuli as specified in the lesson plan.
4. State $S^D$ as specified in the lesson plan.
5. Provide prompt level consistent with the lesson plan.
6. Deliver reinforcement as specified in the lesson plan.
7. Do not reinforce incorrect responses.
8. Conduct a correction trial.
9. Accurately record data.
10. Remove stimuli prior to the start of the next trial.
Appendix B

Data Sheet - Baseline

Discrete-Trial Instruction Skills Taught Through Video Modeling

Jennifer - Teacher

Kourtney - Student

Letter ID – J

1. Establish ready behavior.
2. Wait for ready behavior.
3. Present choices or stimuli as specified in the lesson plan.
4. State Sd as specified in the lesson plan.
5. Provide prompt level consistent with the lesson plan.
6. Deliver reinforce as specified in the lesson plan.
7. Do not reinforce incorrect responses.
8. Conduct a correction trial.
9. Accurately record data.
10. Remove stimuli prior to the start of next trial.

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Session 1
Figure Caption

*Figure 1:* Percentage of discrete trial teaching skills implemented accurately by Sarah, Jessica and Pam.