EFFECTS OF A VIDEO SELF-MONITORING PROCEDURE TO INCREASE TREATMENT INTEGRITY OF PARAPROFESSIONALS' IMPLEMENTATION OF DISCRETE TRIAL TRAINING

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ABSTRACT

Behavior skills training is a didactic training format used to increase skill in an effective and efficient way. Video self-monitoring refers to the process of recording oneself for the purpose of self-review in order to observe and change one's behavior. The purpose of the following study was to determine if an intervention package that included Behavioral Skills Training (BST) and Video Self-Monitoring (VSM) would increase, generalize and, maintain high levels of treatment integrity of paraprofessional staff members while teaching a discrete trial training program to a student with autism. Additionally, student behavior was observed to determine if increased staff effectiveness would affect learner responding. The study found that the intervention package was effective in changing staff behavior by improving their treatment integrity. An observed change in student behavior emerged towards the end of the study when treatment integrity was high across staff members. Staff behavior generalized when the DTT program was implemented with a novel student. Additionally, maintenance of treatment integrity remained high after the intervention was withdrawn. Overall, these findings suggest that BST, followed by VSM, is an effective intervention for changing staff behavior.

TABLE OF CONTENTS

LIST OF TABLES Page

LIST OF FIGURES

CHAPTER 1

INRTODUCTION

Paraprofessionals assist in teaching living skills and supporting daily activities for those who have intellectual and developmental disabilities (Bureau of Labor Statistics, 2018). Paraprofessionals across school and residential settings face many challenges in the workplace. Paraprofessionals identify issues such as inconsistent training, ever-changing and unclear job responsibilities, and lack of acknowledgment as some of the challenges that they face on a daily basis (Carter, O'Rourke, Sisco & Pelsue, 2009). An additional stress factor is the high rate of burnout experienced by paraprofessionals. Maslach and Jackson (1986) defined three major components of burnout. These were increased feelings of emotional exhaustion and inability to complete job demands; negative or cynical attitudes, in particular towards their clients; and displeased feelings towards themselves and their career. A combination of the challenges identified by paraprofessionals, along with burnout, can lead to decreased effectiveness on the job.

When burnout occurs, treatment integrity may deteriorate. Treatment integrity is measured by how closely the independent variable of a treatment plan is implemented as planned (Cooper, Heron & Heward, 2007). Maintaining treatment integrity is essential when implementing treatment goals and behavior plans. It has also been shown to be effective in promoting growth and learning in students throughout the school year (DiGennaro, Martens & McIntyre, 2005). Generally, treatment integrity is monitored by an outside observer. However, the correct implementation of a plan may also be taught using behavioral skills training (BST) or using an evidence-based practice, such as video self-monitoring (VSM). Additionally, behavior skills training followed by the use of self-monitoring may be a more practical application for job sites where supervisors may not always be available for immediate feedback (Burgio, Whitman, & Reid, 1983; Richman Riordan, Reiss, Pyles, and Bailey, 1988).

Self-Monitoring

In his book *Science and Human Behavior*, B.F. Skinner (1953) explains self-control: “When a man controls himself, chooses a course of action, thinks out the solution to a problem, or strives toward an increase in self-knowledge, he is *behaving.* He controls himself precisely as he would control the behavior of anyone else” (p. 228). Self-monitoring is defined as a procedure in which behaviors are systematically self-viewed and self-recorded in order to identify occurrences and nonoccurrence of a target behavior (Cooper et al., 2007). Self-monitoring procedures such as those outlined by Skinner - choosing a course of action or finding a solution to a problem - have been highly effective in changing staff behavior and, consequently, are well recognized in the field of applied behavior analysis (Burgio, et al., 1983; Petsher & Bailey, 2006; Richman et al., 1988). Self-monitoring of staff behavior is vital in order to maintain and promote appropriate, safe, and effective decision making, as well as high procedural integrity (Belifore & Browder 1992; DiGennaro et al.,2007).

Previous studies identifying self-monitoring as an effective tool to change employee behaviors have been primarily conducted in residential settings. Burgio et al. (1983) conducted a study that took into account the cost-effectiveness of a self-management program for the employees in an institutional setting. They sought to find out whether a self-management program, in which staff could rely less on supervisor participation, would result in an increase in effective interactions between staff and the residents who were institutionalized. The participative management program included a goal, set by the staff themselves, a self-monitoring apparatus, instructions on graphing the self-monitoring data, and self-praise for when the staff met or exceeded their daily goal. The experimenters utilized a multiple-baseline across groups of staff to measure the appropriate interactions of 10 direct care staff and the appropriate interactions and play of 15 residents in the institution. The experimenters found that staff who utilized the participative self-management program were more likely to engage in appropriate staff behaviors. Additionally, they found that the residents who were under the care of these staff members were more likely to engage in appropriate requesting and play. The findings of this study were that self-monitoring of staff members could increase appropriate interactions between staff and institutionalized residents. This study also showed that self-praise having met a self-designed goal may be reinforcing for staff members.

Richman et al. (1988) investigated the effects of self-monitoring plus supervisor feedback on staff performance in a residential setting. They investigated whether the appropriate behaviors of direct care staff in institutionalized settings are vital to the wellbeing of those who are institutionalized. This study sought to determine if a self-monitoring procedure would increase compliance of appropriate staff behavior. Similarly to Burgio et al. (1983), the experimenters sought to have the staff rely less on management from their supervisors. Additionally, they wanted to determine whether generalization of appropriate on-schedule and on-task behavior would occur throughout the day. The study followed the afternoon shifts of two houses in a residential setting; the staff members were comprised of three males and seven females ranging in age from 20 to 40 years of age and experience from 1 month to 5 years. The experimenters used a multiple-baseline across groups of staff to implement a self-monitoring condition, followed by a feedback plus self-monitoring condition. The data showed that during the self-monitoring alone condition, appropriate staff behavior, (e.g., contingent and noncontingent interactions, positive social interactions, demonstrable work activity, etc.) increased and when feedback was added the appropriate behavior continued to increase; typically, however, direct care staff encounter very little naturally occurring reinforcement during working hours.

Richman et al. (1988) theorized, “Self-monitoring provides an element of individual responsibility that is often missing in standard, top-down, supervisor-centered staff management systems. It allows employees to come under the control of discriminative stimuli present in the environment and sets the occasion for supervisors to provide positive reinforcement for worthy performance” (p. 408). Although these researchers credit positive reinforcement provided by supervisors, this was not an element of their initial phase (self-monitoring alone). One thing that remained unclear was whether or not self-monitoring, by itself, was reinforcement enough for the staff, or if there was positive feedback provided that was not reported in the study.

Plavnick, Ferreri, and Maupin (2010) evaluated the effects of self-monitoring on the implementation of a token economy system. Secondarily, they tracked the changes of the student’s academic progress, as a result of the self-monitoring of staff, with regards to the implementation of a token-economy. They hypothesized that self-monitoring would be effective in increasing procedural fidelity, which would result in the correct implementation of the token economy system. This, they believed, would lead to improved student outcomes. The participants in this study were three staff members (one teacher and two paraprofessionals) and two students. One of the students was a male aged four years, who had autism spectrum disorder (ASD), and the other student was one female, three years who was diagnosed with Williams syndrome and specific language impairment. The dependent variable for the staff was the percentage of token economy implemented correctly. The dependent variable for students consisted of the percentage of intervals during which they were engaged in two “academic-readiness behaviors,” identified as appropriate sitting and appropriate vocalizing. Plavnick et al. utilized a multiple-baseline across staff and a simultaneous multiple-baseline across students to gauge the effects of the intervention. For staff members, the intervention consisted of pre-training (i.e., baseline), training, implementation, and self-monitoring. The results of the study showed that during the implementation of the intervention (self-monitoring), procedural integrity increased among staff. Additionally, they found that "academic-readiness behavior" increased among both students during the staff self-monitoring phase.

One issue/possible limitation that arose was the carryover effect that was seen between the implementation and staff self-monitoring phase in one student’s data (Playnick et al., 2010). This means that self-monitoring may not have been necessary to increase the students "academic-readiness behavior" and that training and implementation alone might have been sufficient. Finally, two of the staff members’ behaviors remained variable throughout the self-monitoring phase. The reason for this variability was unclear to the authors, and the question that remained was whether an additional element (e.g., a more controlled environment) would increase and maintain high rates of procedural fidelity.

Treatment Integrity

Wilder, Atwell, and Wine (2006) measured the effects of different levels of treatment integrity by studying the effects of 100%, 50%, and 0% integrity of staff implementation of a two-step prompting procedure. The authors observed the effects of the independent variable on compliance in a two-step instruction prompting sequence in two students, both aged four years who had no known diagnoses. The researchers utilized an alternating treatments design to observe the effects of the varying levels of treatment integrity. They found that the compliance increased substantially with 100% integrity of staff implementation of the prompting procedure. Compliance increased moderately for both children with 50% integrity of staff implementation, and compliance remained at low to zero rates with 0% integrity of staff implementation of the prompting procedure. What the experimenters did not control for in this study were the preferred vs. nonpreferred tasks. In other words, some tasks may have been more preferred, thus resulting in different levels of compliance, regardless of the intervention. Overall, the study showed substantial differences in behavior and suggested the importance of high levels of treatment integrity in a two-step prompting sequence.

Weston, David, Radhakrishnan, O'Guinn, and Rivera (2019) compared the effects of performance feedback against the effects of VSM within a BST package on treatment fidelity of pre-service behavior analysts. The researchers analyzed the effects of both interventions on pre-service behavior analysts who were taught, using BST, how to perform a preference assessment. Following BST, the fidelity of the preference assessment implementation was assessed by either an outside observer, for performance feedback condition, or by the subject, for VSM. The researchers found that the both performance feedback and VSM were effective in maintaining high levels of treatment integrity, but that VSM was slightly more effective. This supports the findings of self-monitoring literature.

DiGennaro et al. (2007) examined teachers' treatment integrity after setting a goal based on evidence-based practices, including reinforcement. The study compared the effects of goal setting and performance feedback on student behaviors after teachers received feedback about their implementation of evidence-based practices. Four dyads of special education teachers and their students were the subjects for this study. The study was conducted with a multiple-baseline across groups (i.e., dyads) design, with phases that implemented specific contingencies of self-monitoring. The contingencies included goal setting and student performance feedback, teacher performance feedback, and directed rehearsal with meeting cancellation. Teacher performance feedback and directed rehearsal with meeting cancellation included negative reinforcement (i.e., meeting cancellation) when the teacher's performance was sufficient. Treatment integrity was measured through daily observations. The experimenters found that three out of the four teachers engaged in higher treatment integrity, and their corresponding students engaged in fewer problem behaviors over the course of the study.

Behavioral Skills Training

One problem that paraprofessionals noted when asked about workplace challenges was the lack of training on the job, which may affect their overall performance (Carter et al., 2009). One method of teaching with strong empirical support is behavioral skills training (BST), a combination of written instruction, modeling, rehearsal, feedback, and repetition to mastery (Parsons & Rollyson, 2012). BST has been effective in teaching safety skills to children (Johnson et al., 2005; Miltenberger et al., 2004), to increase generalization of parent teaching (Lafasakis & Sturmey, 2007), and to teach correct implementation of teaching plans, such as DTT.

Miles and Wilder (2009) evaluated the effects of BST on the implementation of guided compliance. The participants for the study were three caregivers, a teacher, a nanny, and a parent. The researcher reported that there had been no previous studies evaluating the effects of successful implementation of guided compliance with caregiver populations. The researchers examined the percentage of correct implementation of 10 components of a guided compliance procedure, and subsequently used a BST package that included instruction, rehearsal, feedback, and modeling. They used a multiple-baseline across participants to observe the effects of the BST package on baseline scores. They found that the implementation of guided compliance improved across all participants. A maintenance probe was completed; while maintenance remained high, intervention gains decreased for two out of the three participants.

Sarakoff and Sturmey (2004) examined the effects of a BST package on staff implementation of a discrete trial training (DTT) program. The researchers utilized a multiple baseline across three special education teacher participants to evaluate the effects of a BST package (i.e., instruction, feedback on baseline performance, modeling, and rehearsal of skills) on a 10-component checklist for correct implementation of a DTT program. The researchers found that the overall percentage of correct implementation increased following the BST package. The authors of this study did not evaluate the effects of staff training on skill acquisition of the student. No generalization or maintenance probes were completed for this study.

Video Self-Monitoring to Increase Treatment Integrity

Pelletier, McNamara, Braga-Kenyon, and Ahearn (2010) conducted a study in which video self-monitoring was used to evaluate the treatment fidelity of one student's behavior intervention plan. The experimenters stated that video self-monitoring could be an effective tool for teaching behavior change and similar to the advantages expressed by Burgio et al. (1983) and Richman et al. (1988), it requires less response effort, on behalf of supervisors, in comparison to other staff interventions (e.g. contingent feedback, behavioral lotteries, etc.). The experimenters in this study sought to evaluate the effects that a video self-monitoring treatment package would have on the correct implementation of a student's behavior plan using multiple-baseline across participants.

Baseline data on three target behaviors were recorded, along with a video recording of the teachers implementing the plan. Once they attained steady rates of baseline behavior, the teachers observed themselves implementing the plan. After self-observation was implemented, the teachers scored themselves using a procedural integrity tool. The researchers found that the correct implementation of the behavior intervention plan increased across all three staff members. Two of the three teachers' procedural integrity remained steady at 100% during the video-self-monitoring implementation. During the follow up of these two teachers, one teacher's procedural integrity remained at 100%, while the other's integrity of implementation fell to 86%. A follow up for the third teacher was not available. This study suggests that video modeling alone is an effective method for changing staff behavior in regards to correctly implementing one student's behavior intervention plan.

Belifore, Fritts, and Herman (2008) argued that DTT is an effective method for teaching students who have autism, but that procedural integrity in DTT programs is often lacking. Belifore and colleagues evaluated whether the effects of video self-monitoring would increase the correct implementation of a DTT program. They utilized four staff members in a private facility and observed their implementation of DTT. When baseline data showed that procedural integrity was low, they implemented a video self-monitoring component. During the intervention phase, the staff conducted the DTT program with a student, and immediately following the implementation they observed a tape of the session. They then utilized a checklist to determine if they had implemented the program correctly. Procedural integrity increased during the video self-monitoring intervention. The investigators conducted a follow up with a maintenance phase. During follow up, procedural integrity decreased for two of the three teachers who were observed. However, correct implementation of DTT did not fall back to baseline levels when maintenance was conducted.

Purpose

Approaches that have been effective in increasing treatment integrity of staff members include video modeling, self-monitoring, feedback, and reinforcement (e.g., Belifore et al. 2008; Pelletier et al., 2010). The purpose of this study was to replicate and expand on the findings of Belifore et al. (2008) to determine the effects of video self-monitoring on the treatment integrity of a student's DTT program implementation. The following research questions were addressed:

What are the effects of video self-monitoring on increasing the treatment integrity of paraprofessionals' behaviors while implementing a discrete trial training program with students who have autism? Secondarily, this study sought to find whether higher procedural integrity would increase students' correct responding during DTT; specifically, does higher procedural fidelity, as a result of behavioral skills training and video self-monitoring, correspond with an improvement in a student's performance in a DTT program? Finally, this study investigated whether generalization paraprofessionals' behaviors will be achieved in the same DTT program across students.

CHAPTER 2

METHOD

Settings and Participants

Three staff members (two senior program associates and one program manager) who worked in a group home setting were selected to participate in this study. All staff members who took part in this study were familiar with the students and their goals. Each staff member had training on the DTT program, provided by Senior Behavior Analyst, provided at the time of their employment. For the first staff member, Alex, this training occurred one year prior. Alex was a 34-year old male. This was his first job in the field of ABA, but he had an extensive career background in dealing with an autism population. The second staff member, Elena, 28-years-old, was the most senior staff member of the house, having worked there for three years. Both Alex and Elena were direct care staff. Alex had a bachelor's degree, and Elena was working towards hers. The third participant, Molly, 30-years-old, was the group home manager. She had held previous ABA job positions and was working towards her master’s degree. The previous DTT training consisted of verbal direction and modeling. The training occurred three years prior for one of the senior program associates (Elena), one year prior for the second senior program associate (Alex), and six months prior for the program manager (Molly).

Two student participants, both aged 20, were selected for this study. Both student participants have a diagnosis of Autism Spectrum Disorder (ASD), each had additional diagnoses and had lived in the community residential setting for multiple years. These students had similar number identification DTT goals, which written by an ABA Specialist in combination with a BCBA. The first participant, Daniel, had been working on the goal for a year and a half. The second participant, Cameron, had been working on the goal for over two years. Student responding for these goals had not shown significant improvement or mastery over time. The goals had been run on an inconsistent basis due to unreliable staffing and varying management in the group home.

Each session occurred in the group home at the dining room table. The student participant and instructor remained seated across from one another. The experimenter was also seated at the table for the initial sessions, maintenance, and generalization sessions to record. Sessions were recorded with the experimenter's iPhone, and student's data were tracked using a previously created datasheet.

Criteria for staff participant inclusion in this study included the following; staff who have been trained in the past but who show lack of treatment integrity in implementing ABA programs. This was measured by utilizing a treatment integrity checklist (Appendix A). The criterion for inclusion was defined as staff who score 80% or lower on an initial treatment integrity checklist. Staff will not be required to have previous training in ABA; exclusion criterion was defined as scoring higher than 80% on the treatment integrity checklist (Appendix A). Inclusion criterion for the student participant included having one goal that had not yet been mastered and is achievable through DTT.

Materials

The materials needed were a portable device with video recording ability, and data collection tools, including the treatment integrity checklist, DTT number cards, and datasheets.

Dependent Variable

The dependent variable for this study was treatment integrity. Treatment integrity was defined as the correct implementation of specific steps of a DTT intervention. These steps were similar to those used by Belifore et al. (2008), and were defined as follows: the discriminative stimulus (SD) was delivered in a clear manner, the staff member waited 3-5 seconds for the student's response, then indicated whether the student responded correctly (+) or incorrectly (-). If the student responded correctly, social praise or reinforcement was provided, if the student responded incorrectly, error correction was delivered within two seconds of the incorrect answer. Error correction was provided with correct prompting procedures and, the subsequent SD was delivered within 3-5 seconds of the correct student response or error correction prompt.

Treatment integrity was measured using a checklist, as shown in Appendix A, as percentage of possible steps correct. In addition to the measurement of treatment integrity, the student's program data was also measured. These data served to investigate whether an increase in treatment integrity led to progression towards mastery. Student responses were scored as either "correct" or “incorrect.” These data were counted as trials correct in a session and were calculated as percentage correct.

CHAPTER 3

PROCEDURES

Experimental Design

A multiple-probe design across participants was used for this study to evaluate the dependent variable across baseline and two intervention conditions. Baseline probes were taken, followed by a true baseline during each participant's stage. Following true baseline, BST was implemented. For the first participant, Alex, true baseline consisted of 4 sessions; following this, BST was provided. This training lasted 45 minutes. For Elena, one baseline probe was taken, followed by five true baseline sessions. Elena completed BST in 50 minutes. Two baseline probes were recorded for Molly, followed by three true baseline probes. BST was provided to Molly for 1 hour and 15 minutes. Subsequent to the BST, the first phase the first intervention condition (VSM) was implemented. VSM included the experimenter and the subject completing the fidelity checklist together; the second intervention condition (VSM-alone) consisted of the subject implementing video self-monitoring without the experimenter present. This phase was followed by a generalization probe, and finally, a maintenance probe.

A multiple-probe design across participants was used for this study because treatment integrity, once implemented, should not be removed for the sake of the student, and self-monitoring, once taught, cannot be unlearned. This design exhibited a change in the participants' behavior when the intervention was implemented.

Baseline

During baseline, no intervention was in place. Staff members were instructed to conduct the DTT program, which was part of the students' daily goals as usual. Data were collected by the experimenter during the baseline condition on a DTT number identification program. Both the student's behavior and the staff members' behaviors were measured. Staff members were directed to complete between 5 and 10 trials each session. Each session lasted approximately five minutes.

Intervention

The intervention was comprised of the following components; first, BST was provided so that staff could implement all steps correctly. Then, video self-monitoring (VSM) and VSM-alone were implemented to evaluate the effectiveness of the self-monitoring portion of this procedure. During the VSM phase, the experimenter and participant scored the video together until inter-rater reliability was achieved in accordance with the treatment fidelity checklist (Appendix A). The VSM phase was followed by VSM-alone. During this phase, the participant recorded a video of themselves and scored it alone. Generalization and maintenance phases were also completed without self-monitoring.

Training

BST was provided to staff members in order to achieve high integrity implementation of the DTT program. BST was implemented until stable performance was achieved (i.e., staff achieved the same percentage of steps correct, above 50%, across three sessions). BST consisted of the following steps: first, staff members were trained to implement the number identification DTT program in a didactic format. This was comprised of five phases: instruction (written and verbal), modeling, rehearsal, feedback, and repetition. This is a model similar to a that used by Rosales, Stone, and Rehfeldt

(2009), which was shown to be effective in training on a picture exchange communication system.

The written instructions provided for training are outlined in Appendix B. The repetition component included repeating the modeling, rehearsing, and feedback components. Staff members were cleared to begin implementation of DTT with the student in the intervention phase when they achieved the same percentage of steps correct, above 50%, across three sessions. The training checklist (Appendix D) was utilized to implement consistent staff training and collect data on staff implementation of DTT during BST. The DTT program utilized during training was the same as the student's number ID program conducted during the intervention.

Video Self-Monitoring

Following BST, the self-monitoring portion of the intervention was implemented. During the post-training condition (VSM), teachers continued to run the same DTT number identification program with one student. This DTT was the same as the program run during baseline and BST. Each session was recorded via iPhone. During the three initial sessions, the experimenter and staff member sat together while the staff member ran the program with the student and recorded it on the experimenter's iPhone. Both the experimenter and the staff member kept data, and inter-rater reliability was established between experimenter and staff member until data was consistent. Consistent inter-rater reliability was defined as both participants responding within 10% of one another across three sessions. Following these inter-rater reliability sessions, staff then implemented the video self-monitoring by themselves (VSM-alone).

Video Self-Monitoring Alone

VSM-alone was similar to VSM, but the experimenter was no longer present. During the VSM-alone phase, the staff member recorded themselves completing between 5 and 10 discrete trials in each session, followed by the self-monitoring portion of the intervention. Staff members started and ended the recording at the beginning and end of each session. Both the staff member and the student were visible in the recordings, as well as the table and materials they were using. Once finished, they stepped out of the room to score the video using the treatment integrity checklist. Each staff member was encouraged to pause and/or reviewed more than once during this phase of the training in order to document and report an accurate recording of behavior. Following each session, the staff then returned the self-monitoring checklist to the experimenter.

The experimenter completed an additional follow up treatment integrity checklist to ensure that reporting was accurate. This was completed either in person or by scoring a video. Mastery of VSM-alone was achieved when the staff member reached above 90% correct of DTT implementation across three sessions.

Generalization

Generalization of the skill was assessed with each of the staff members running the program with a novel student who had the same DTT program, and who lived in the same group home. The treatment integrity checklist (Appendix A) was used by the experimenter, while the staff member implemented DTT with the second student. This generalization probe occurred following mastery of the intervention phase. These sessions were not recorded, and self-monitoring of these trials was not completed.

Maintenance

Maintenance of treatment integrity was assessed, time permitting, following two weeks without intervention. The staff member participants of this study did not have to complete self-monitoring checklists during these two weeks, but the option was available to them.

Interobserver Agreement and Procedural Integrity

Interobserver agreement (IOA) was collected using recorded videos of the participants to score correct and incorrect steps of the program as implemented by the three subjects of this study. IOA training occurred until the primary and secondary observer agreed at least 80% of the time. This was achieved using a video taken during Alex's (i.e., participant 1) VSM, and was achieved following one session. IOA was measured with the same treatment integrity checklist as provided to the staff members (Appendix A).

IOA was evaluated across 33% of intervention sessions (VSM, VSM alone, generalization, and maintenance). IOA was calculated using the point by point formula. This was achieved by the number of agreements divided by the total number of agreements and disagreements, then converted into a percentage. IOA values for each step were calculated as follows; Step 1: The S^D was delivered in a clear manner, mean score 100% (range (100%-100%) ; Step 2: The paraprofessional waited 3-5 seconds for the student’s response, mean score 100% (range (100%-100%); Step 3: If the student responded correctly, social praise or reinforcement was provided, mean score 96% (range 67%-100%); Step 4 = If the student responded incorrectly, error correction was delivered within 2 seconds of incorrect answer, mean score 100% (range 100%-100%); Step 5 =

Error correction was provided with correct prompting procedures, mean score 94% (range 67% - 100%); Step 6 = The paraprofessional indicated whether the student responded correctly (+) or incorrectly (-), mean score 90% (range 50%-100%); Step 7 = The next S^D was delivered within 3-5 seconds correct student response or error correction prompt, mean score 94% (range 83%-100%).

The scores observed in the student's progress will indicate whether or not treatment integrity affected correct responding of a DTT goal. Treatment integrity for the intervention was measured by utilizing the procedural fidelity checklist, Appendix C, across 3 VSM intervention sessions (one for each participant), and 4 VSM-alone sessions (one for Alex, one for Elena, and two for Molly). Treatment integrity was calculated by dividing all steps completed correctly by all steps completed correctly, plus all steps completed incorrectly. Treatment integrity across phases and participants was 100%.

Additional treatment integrity was score using videos to ensure that self-reporting was occurring accurately. This treatment integrity was scored by dividing all steps agreed upon divided by all scored agreed and disagreed upon. This was scored twice for each participant during the VSM-alone phase. For Alex, treatment integrity mean was 97% (range 93%-100%). For both Elena and Molly, the mean treatment integrity score was 100% (range 100%-100%).

Social Validity

A social validity questionnaire (Appendix E) was be completed by the BCBA, who oversees the group home staff and the student's programs. A five-point Likert Scale was completed to evaluate overall social validity; this was completed at the end of the study. The overseeing BCBA scored a 5 for most questions on the social validity questionnaire, indicating this intervention was socially valid for this setting and these participants.

CHAPTER 4

RESULTS

Staff Behaviors

The percentage of steps correct during implementation of a DTT program are presented in Figure 1. During pretraining baseline, staff members taught the DTT goal as they generally would, with no additional training. Percentage of steps correct while implementing DTT varied largely across participants. Alex and Elena had more experience running the DTT goal; as a result, their baseline scores were higher during baseline. Their scores did not meet exclusion criteria. Molly's initial correct implementation was very low but did increase during true baseline; this will be discussed further in the limitations section. During baseline, Alex had a mean score of 44% correct, ranging from 31-55%. Elena showed a mean score of 57%, which ranged from 42-69%. Finally, Molly had a mean score of 48% correct with a range of 36-60%.

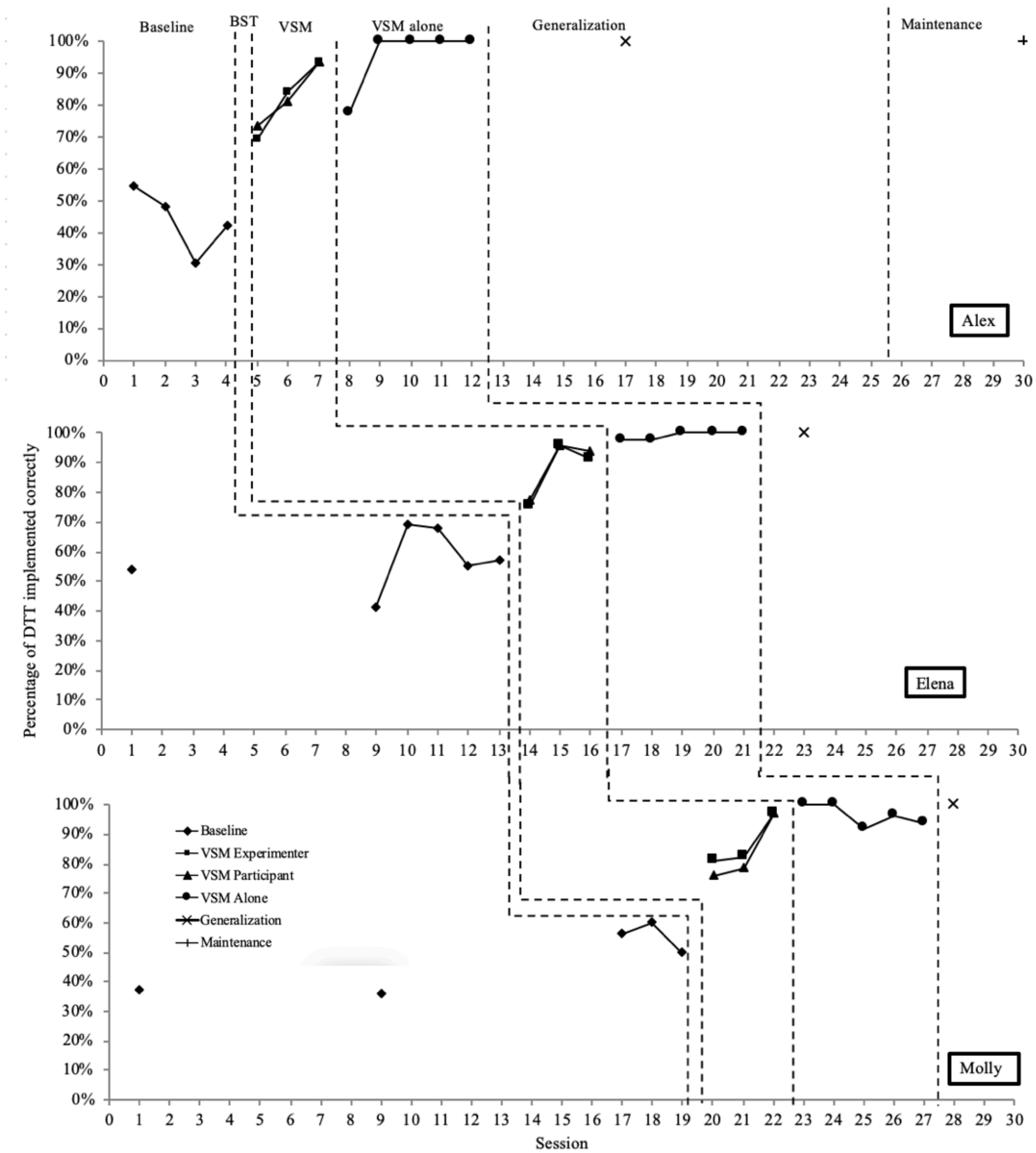

Figure 1. The percentage of correct implementation, generalization, and maintenance of DTT goal during baseline and post-training for staff members.

The use of BST plus VSM proved effective in increasing the treatment integrity of DTT goal running for all staff members in this study. Table 1 compares the combined percentage averages across phases and steps of correct of DTT implementation. The majority of errors observed during baseline occurred in step 4 (0% of all steps correct), step 5 (0% of all steps correct), step 6 (15% of all steps correct), and step 7 (59% of all steps correct). Responding in each step increased significantly; step 4 increased to 95% of all steps completed correct, step 5 increase to 97% correct, step 6 increased 75% correct, and step 7 increased to 87% correct during VSM and VSM-alone. These combined results continued to increase during generalizing (100% across steps) when staff members ran the same goal across learners.

Table 1
Combined Percentage of DTT Steps Correct During Baseline, VSM & VSM-alone, Generalization and Maintenance

	Percentage of DTT Implemented Correctly						
Phase	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Baseline	100	99	92	0	0	15	59
VSM & VSM-alone	100	100	100	97	87	75	87
Generalization	100	100	100	100	100	100	100
Maintenance	100	100	100	100	100	100	100

Note. DTT = Discrete Trial Training. Step 1 = The S^D was delivered in a clear manner; Step 2 = The paraprofessional waited 3-5 seconds for the student's response; Step 3 = If the student responded correctly, social praise or reinforcement was provided; Step 4 = If the student responded incorrectly, error correction was delivered within 2 seconds of incorrect answer; Step 5 = Error correction was provided with correct prompting procedures; Step 6 = The paraprofessional indicated whether the student responded correctly (+) or incorrectly (-); Step 7 = The next S^D was delivered within 3-5 seconds correct student response or error correction prompt.

Each participant met mastery criteria of the BST component after one training session. An immediacy of effect was observed across participants during post-training (VSM and VSM-alone), which indicated that BST was effective in increasing treatment integrity. Additionally, there were zero percent of overlapping data points between baseline and post-training. During the VSM condition, the experimenter and subject agreed on the percentage of DTT correct within ten percentage points, 100% of the time.

During this VSM phase, each participant's score continued to increased, which indicates that VSM was also effective in increasing treatment integrity.

During the VSM-alone, both Alex and Elena continued to engage in high rates of treatment integrity. Molly continued to have high treatment integrity rates, but her behavior did not remain at 100% throughout the course of VSM-alone. Although her rates were not at 100%, her scores did not drop below mastery level in VSM-alone. Treatment integrity also remained high during generalization for all staff participants. Finally, maintenance was evaluated with Alex; his treatment integrity remained at 100%.

Student Behaviors

Figures 2 and 3 show average student responding to DTT throughout the course of the investigation. Figure 4 shows student responding in alignment with staff providing treatment and across phases. Daniel’s responses were recorded during each phase (i.e., baseline, VSM, and VSM-alone, and during maintenance). Cameron’s responses were recorded at the beginning of the study and the end for comparison (i.e., baseline and generalization).

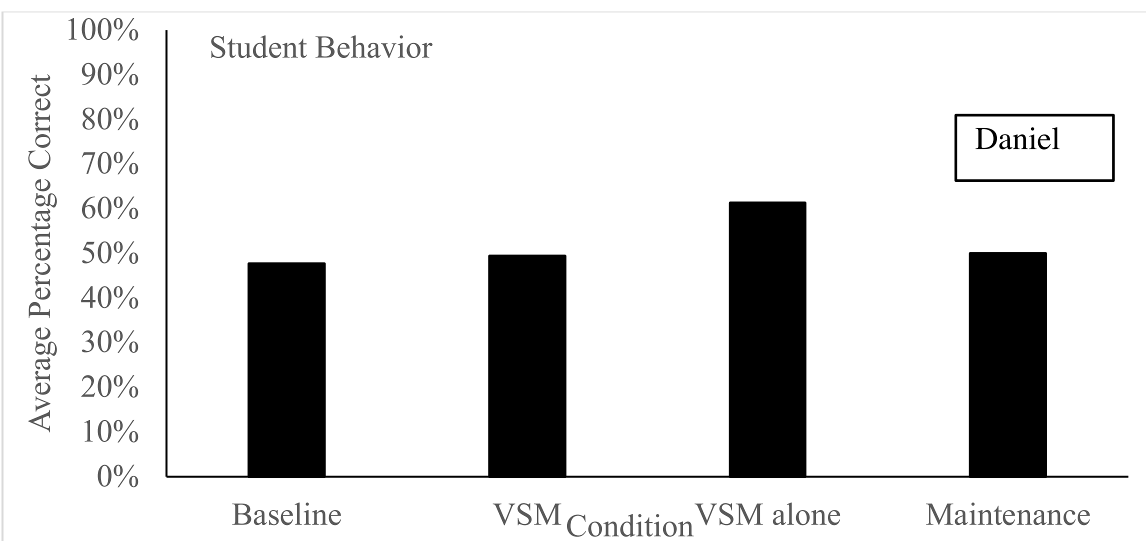

Figure 2. Student responding for Participant 1. Average of all responding percentage correct across baseline, VSM, VSM-alone, and maintenance.

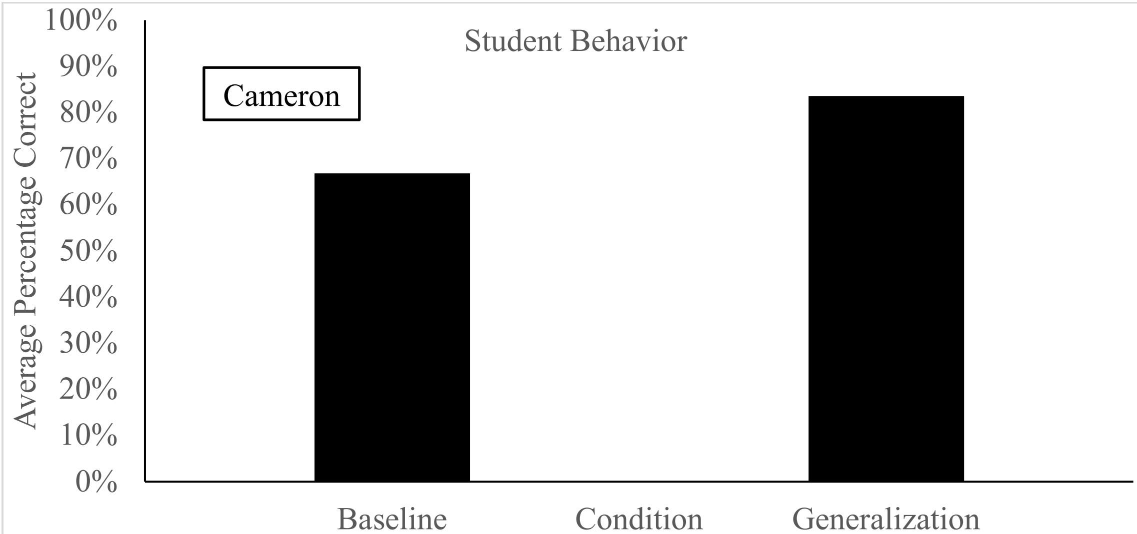

Figure 3. Student responding for Participant 2. Average of all responding percentage correct across baseline, and generalization probes.

Daniel’s responses remained variable throughout the study. Percentage correct responses averaged 48% during baseline, 49% during VSM, and 61% during VSM-alone, indicating a change occurred in student responding as a result of an increase in treatment integrity. Daniel's responding remained variable across all phases and participants until VSM-alone with Molly (i.e., final phase with final staff participant). This would suggest that high treatment across staff members did affect student behavior. During this phase, student behavior was on a clear increasing trend. This trend did not continue during maintenance.

Cameron's responding began high during staff baseline and remained high during the generalization probes. Although these data indicate that Cameron was responding correctly, his responding remained variable outside of the investigation's data collection, and he did not master the numbers in question. Some reasons for the lack of mastery will be discussed in the following section.

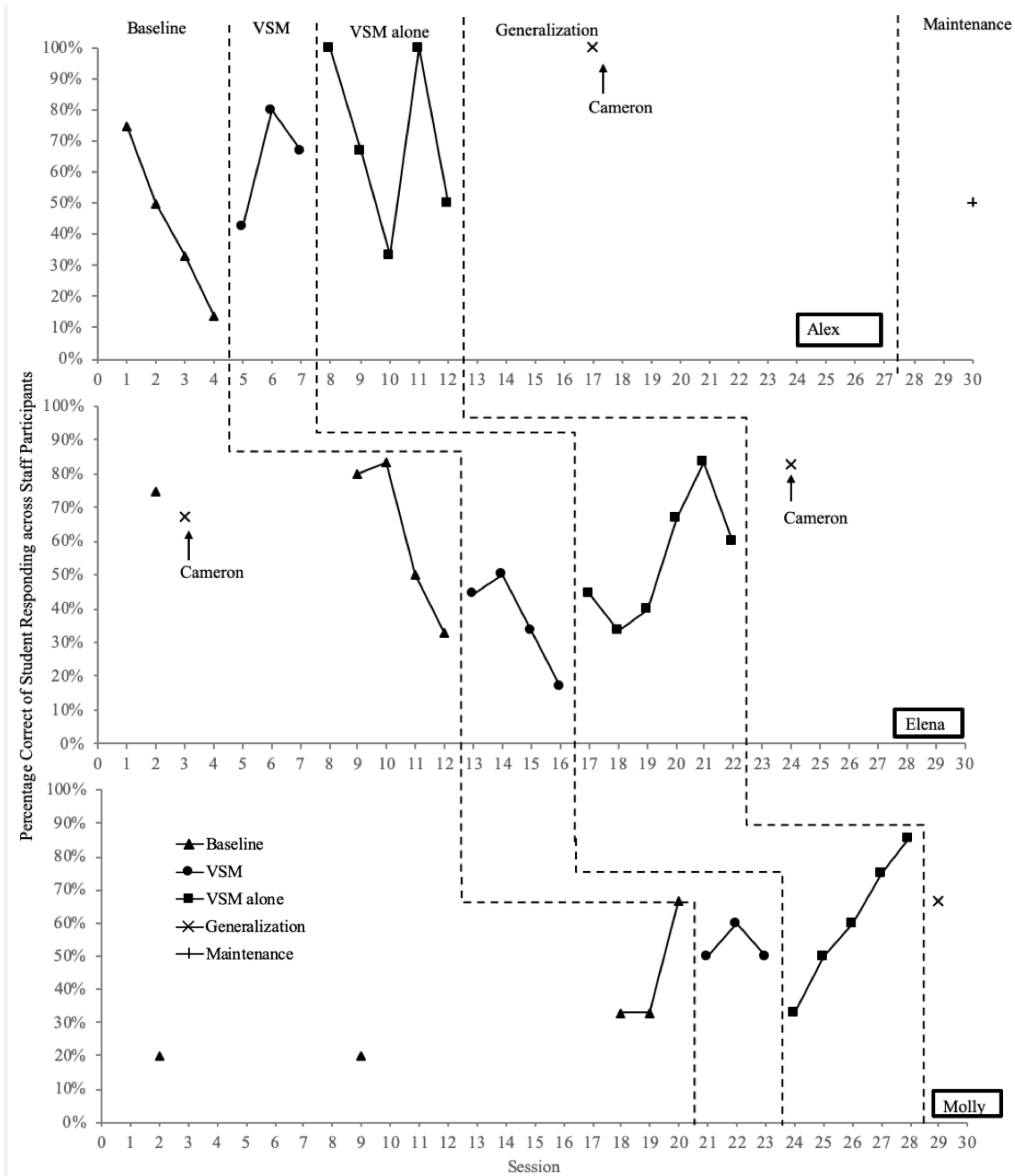

Figure 4. Percentage correct of student responding across participants and in all phases.

CHAPTER 5

DISCUSSION

The findings of this study validate those previous experiments (Belifore et al. 2008, Pelletier et al., 2010) who evaluated the effects of Video Self-Monitoring on staff behavior and saw an increase in treatment integrity as a result. Belifore et al. (2008) evaluated staff members using a DTI program, while Pelletier (2010) evaluated staff responses in a behavior plan. Belifore et al. (2008) found that VSM was effective in increasing treatment integrity of a DTT goal, which was found to be the case in this experiment. During the previous study, treatment integrity began at a higher rate during baseline. The findings of this study expanded on those of Belifore et al. (2008) to include a systematic training for lower initial treatment integrity (BST) and to include generalization of high treatment fidelity by staff members as they taught the same DTT goal across students. The current study also expanded on previous research (Belifore et al. 2008, Pelletier et al. 2010) by comparing high treatment integrity to corresponding student behavior.

The results of this study support previous findings in relation to self-monitoring and BST. Similarly to Burgio et al. (1983) and Richman et al. (1988), this study found self-monitoring for staff members to be an effective behavior change strategy. This also supported the advantages stated, which included less supervisor oversight while achieving very effective results. This study also expands on the BST literature. In relation to Sarakoff and Sturmey (2004), this study corroborated the effectiveness of BST to teach DTT and expanded by evaluating the effects of staff training on skill acquisition of the student.

A unique aspect of these interventions is that they offer an option for staff members to engage in self-monitoring, but they also produced a permanent product (i.e., video), which could be viewed by management if confirmation of correct responding was desired. This intervention can be used across many programs and would be an effective tool for management team members of direct support staff, who are faced with complex behavior plans and goals, with minimal training. It may also an effective tool for training recently hired staff in a field that experiences such high rates of turnover.

This study also showed that higher procedural fidelity, as a result of BST and VSM, corresponded with some improvement in a student's performance in a DTT program, although this was not observed until the final phase, and only with the final participant. This supports the findings of Wilder et al. (2006), who discovered that inconsistency in treatment integrity can result in varying degrees of consumer's correct responding. The target student behaviors measured in the current study were simultaneously being taught by staff members who were not part of the study and did not receive the intervention. Observation of these teaching sessions that occurred outside of the study suggested that treatment fidelity remained low among staff outside of the study. Because of varying degrees of treatment integrity within and outside of the study, student responding may not have consistently improved (Wilder et al. 2006).

Many limitations should be taken into consideration when evaluating the current study. For example, only three participants were chosen to participate. Additional staff members should be assessed in future research in order to verify these results. Additionally, this research was completed over a short course of time. Future studies should expand on this research for a longer period of time in order to evaluate the effects on both staff and student behavior. This would also aid in assessing the validity of the maintenance probe. Also, to avoid the effects of outside teaching procedures in confounding the dependent variables, future researchers should select a skill that will only be taught by the intervention applied in the study.

An additional limitation includes the experimental design, some of the issues surrounding multiple baseline across participants include the following; during this multiple baseline design reversal of the conditions was not evaluated making the results less substantiated (i.e., the response to intervention is only seen once with each participant) as opposed to a reversal design where the response can be measured repeatedly with and without the intervention. An additional limitation to multiple baseline designs is that because of the staggered nature of the design, both the staff and learner's behaviors were impeded for long periods of time. The second and third staff members had a lengthy delay to BST, and continued to run the goals with low treatment integrity. As a result, student learning was hindered.

The students who were assessed were both older male students who had a lengthy history of reinforcement with these staff, responding to staff, and with these programs. Additionally, they both had multiple diagnoses, resulting in significant intellectual disability. This study should be replicated in the future to evaluate the efficiency of higher treatment integrity on younger students or those without significant intellectual disabilities.

An additional limitation during this study was that the goal in question was run as part of the student's original treatment package, in order to keep social validity high. The goal, as previously written, was for the target stimulus to be selected in a field of two.

The lack of increase in correct student responding for so long may also have been due to the lengthy history of reinforcement for the learner. For an extensive amount of time, all responding generally resulted in 50% correct, and therefore 50% chance of reinforcement for each response. Future studies should take this into account by increasing the number of items in the field to reduce the likelihood of 50% correct responding by chance through guessing. These effects may be deterred by adding an additional distractor item to the field, and by providing specific reinforcement for correct responding.

The setting of this study posed a significant limitation for this study, which resulted in a threat to internal validity. In a group home setting, little privacy can be achieved; staff discussion and observations are uncontrollable. Both Elena and Molly had an increase in correct responding during baseline. This may have been a result of carryover as a result of staff members discussing correct steps, or possibly having overhearing exaggerated praise, reinforcement, verification, etc. Future research should take the setting issue into consideration. This study should be done in a more controlled environment, with more privacy to increase the validity of the findings. Due to the nature of a group home, a more controlled setting may be necessary to avoid confounded results.

An additional limitation to this research is that although VSM was intended to be observed as the main intervention, the BST phase may have played a large role in the increase in skill level of the staff members. The immediacy of effect between baseline and VSM (i.e., where BST occurred) supports that this may be a limitation. Alternatively, it is apparent that learning is still occurring during VSM, which indicates that it is likely the intervention package (BST & VSM) is what resulted in higher treatment integrity among staff. Future research should consider this and evaluate/compare the effects of a packaged intervention, including BST and VSM, versus BST and/or VSM alone.

An additional limitation to the current study was a lack of functional analysis, reinforcement, and long-term maintenance. Future literature should investigate whether staff behavior is performance-based, or competency-based, and reinforce accordingly. No reinforcement was provided to staff members during the course of this study. During this study, reinforcement can likely be attributed to observing their own behavior and observing themselves score higher as the intervention progressed.

Despite the limitations previously mentioned, this investigation expands previous research by confirming the effectiveness of BST in combination with VSM. The use of BST and VSM may be an effective approach to increase treatment integrity of staff members for implementing alternative programs, plans, and goals in a group home setting.

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APPENDIX A

SELF-MONITORING CHECKLIST

Staff Observed: _____________________ Observer: __________________________									Date: ____________ Time: ____________
Critical Skills	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Trial #6	Trial #7	Trial #8	Trial #9
1. The S^D was delivered in a clear manner.	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-
2. The paraprofessional waited 3-5 seconds for the student's response	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-
3. If the student responded correctly, social praise or reinforcement was provided	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a
4. If the student responded incorrectly, error correction was delivered within 2 seconds of incorrect answer	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a
5. Error correction was provided with correct prompting procedures	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a
6. The paraprofessional indicated whether the student responded correctly (+) or incorrectly (-)	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-

7. The next S^D was delivered within 3-5 seconds correct student response or error correction prompt	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a	+/-/ n/a
% Correct									
Key: + = correct response - = incorrect response n/a = not applicable									

APPENDIX B

DISCRETE TRIAL TEACHING INSTRUCTIONS

1. Introduce the Sd (number)
2. Response
    a. Correct – praise/reinforcement & verify
    b. Incorrect – error correction
        i. Error correction – “no, this is the right answer,” (or variation) & distraction trial
        ii. Represent the Sd (number)
            1. Correct – moderate praise

Incorrect – remove materials and restart with new Sd.

APPENDIX C

VIDEO SELF-MONITORING PROCEDURAL FIDELITY CHECKLIST

Staff Observed: ______________________ Date: _____________

Observer: ___________________________ Time: _____________

Critical Skills	Trial #1
1. Paraprofessional will collect all materials prior to starting the session	+/-
2. Paraprofessional will start the video prior to delivering initial S^D	+/-
3. Within 1 minute of finishing the session, the paraprofessional reviewed the video alongside the ABA Specialist (during VSM)	+/-/ n/a
4. Self-monitoring checklist was completed while watching the video	+/-
5. If video self-modeling checklist was scored incorrectly, feedback was provided in 3-5 seconds by the ABA Specialist (during VSM)	+/-/ n/a
6. If video self-modeling checklist was scored correctly, social praise was provided (during VSM)	+/-/ n/a
% Correct	

Key:
+ = correct response
- = incorrect response
n/a = not applicable

APPENDIX D

TRAINING CHECKLIST

Training Checklist		
Step	Description	Occurred
Instruction	1. Experimenter explained the importance of treatment integrity and provided a copy to staff for referral.	Y / N
	2. Experimenter outlined steps of DTT (refer to DTT checklist during this step).	Y / N
	a. The S^D was delivered in a clear manner.	Y / N
	b. The paraprofessional waited 3-5 seconds for the student's response.	Y / N
	c. If the student responded correctly, social praise or reinforcement was provided.	Y / N
	d. If the student responded incorrectly, error correction was delivered within 2 seconds of incorrect answer.	Y / N
	e. Error correction was provided with correct prompting procedures.	Y / N
	f. The paraprofessional indicated whether the student responded correctly (+) or incorrectly (-).	Y / N
	g. The next S^D was delivered within 3-5 seconds correct student response or error correction prompt.	Y / N
	3. Experimenter gave examples and non-examples of correct implementation.	Y / N
Modeling	1. Experimenter and fellow ABA Specialist (or BCBA) demonstrated DTT with high fidelity.	Y / N
	2. Experimenter modeled at least 5 trials and allowed for questions.	Y / N
Rehearsal	1. Experimenter acted in the role of the student while staff implemented DTT of a number ID program.	Y / N
	2. Experimenter set up at least 7 opportunities for learning (i.e. intentionally answered incorrectly).	Y / N

	3. Staff completed at least 10 trials with high fidelity.	Y / N
Feedback	1. Experimenter provided specific feedback via treatment integrity (as completed by additional ABA Specialist or BCBA).	Y / N
	2. Experimenter outlined any need for improvement and strong points observed.	Y / N
Repetition	1. Experimenter determined, via treatment integrity checklist, whether additional trials were necessary.	Y / N
	2. Staff and experimenter continued with modeling, rehearsal and feedback steps until 100% treatment integrity was mastered.	Y / N
	3. Experimenter tracked trials of modeling, rehearsal and feedback until mastery.	Y / N

APPENDIX E

SOCIAL VALIDITY QUESTIONNAIRE

Supervisor Name: _______________

Date: ______

Score the following statements from 1 to 5, 1 meaning "I strongly Agree with this statement," and 5 meaning "I strongly Disagree with this statement."

1. It is important for paraprofessionals to implement a goal with high treatment integrity.

1	2	3	4	5

2. Students benefit from high treatment integrity (in regards to paraprofessionals running plans).

1	2	3	4	5

3. High treatment integrity is important to improve paraprofessionals' overall work performance.

1	2	3	4	5

4. I liked the training and strategies used.

1	2	3	4	5

5. Behavioral skills training was easy to understand and improved paraprofessional's skills.

1	2	3	4	5

6. Video self-monitoring was easy to implement and improved paraprofessional's skills.

1	2	3	4	5

7. BST and VSM were cost effective procedures.

1	2	3	4	5

8. BST and VSM were effective tools for changing paraprofessional's behavior (increasing treatment integrity).

1	2	3	4	5
9. BST and VSM were effective tools for changing student's behavior and increasing skills (mastered goals).				
1	2	3	4	5
10. BST and VSM produced the desired effects during this study.				
1	2	3	4	5