

THE EFFECTS OF VIDEO FEEDBACK AND SELF-MONITORING ON THE
TREATMENT INTEGRITY OF SOCIAL-SKILLS
GROUP THERAPISTS

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ABSTRACT

The study evaluated the effectiveness of a video feedback and self-monitoring intervention on the treatment integrity of undergraduate student therapists leading a social skills group in a small clinic for children with autism. The student therapists' behavior targeted for intervention included the delivery of reinforcement, the delivery of an error-correction procedure, and the delivery of a demand while programming for social interactions within the social skills group. Using a multiple-baseline across behaviors design, the procedure consisted of pre-baseline training, baseline, video feedback with self-evaluation, followed by self-monitoring once a preset criterion had been met. Results indicated that the video feedback increased treatment integrity to mastery criteria, and that the self-monitoring component somewhat maintained the mastery level of performance across participants. However, the time constraints and the rate at which the behavior changed lead to practical limitations of the intervention.

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CHAPTER 1

INTRODUCTION

The Center for Disease Control and Prevention (CDC, 2016) estimates that 1 in 68 children are diagnosed with Autism Spectrum Disorder (ASD) in the United States, across all races, ethnicities, and social-economic groups. According to the American Psychiatric Association (APA, 2013), individuals with ASD display deficits in social communication and social interaction, along with communication deficits and restrictive behavior. These social deficits can include back and forth social-communicative interactions, abnormality in non-verbal social gestures, and difficulty in developing and maintaining social relationships. Kaat and Lecavalier (Kaat & Lecavalier, 2014), explain that most treatments attempt to treat the comorbidity of deficits seen in individuals with ASD, rather than explicitly focusing on the individual components of ASD (e.g., the social component). However, as of the 1990's, individual social skills treatment has become more prevalent in the literature, followed by group social skills treatment in the 2000's.

Kaat and Lecavalier (Kaat & Lecavalier, 2014), reported that group social skills treatments currently make up the fourth most common treatment for ASD. Social skills training aims to improve the social competence of individuals, which can be defined as the ability of one to participate in social interactions with others. Matson, Matson, and Rivet (Matson et al., 2007) suggest that social impairments are the most defining deficits of the disorder. These behaviors, including poor eye contact, failure to initiate conversation, and the display of odd mannerisms, can follow a child through life and worsen through adulthood. White, Keonig, and Scahill (White et al., 2007) associate

those deficits in social skills with loneliness, peer rejection, social isolation, academic struggles, and anxiety. The extent to which these deficits affect a child's life in multiple environments means that the problem is socially important, making the search for an effective treatment a top priority for behavior analysts and other professionals.

Matson, Matson, and Rivet (Matson et al., 2006) define social skills as, “the interpersonal responses with specific operational definitions that allow the child to adapt to the environment through verbal and nonverbal communication” (pg. 15). Social skills have been taught using a wide variety of techniques including social stories, peer-mediated treatment, music therapy, and modeling with reinforcement (Camargo, Rispoli, Ganz, Hong, Davis, & Mason, 2016; Matson, Matson, & Rivet, 2007). Kaat and Lecavalier (Kaat & Lecavalier, 2014), note that social skills have also been taught across a wide range of modalities including individual treatment sessions, parent programs, and group settings.

Group-Based Social Skills Instruction

One intervention that has proved both popular and effective for children with ASD is group-based social skills treatment. White, Koenig, and Scahill (White et al., 2007) assert that despite struggles with generalization, group-based social skills training has been shown to increase social competency in skills that are directly and explicitly taught. In facilitating social interactions, social skills groups are able to capitalize on the natural opportunities to practice interactions with peers (Deckers, Muris, Roelofs, & Arntz, 2016; White, Koenig, Scahill, 2010).

Kaat and Lecavalier (Kaat & Lecavalier, 2014), completed a methodological review of group-based social skills treatments, and found that the methodological rigor of

the treatments has improved over the years, along with enhanced participant characterization and more randomized control trials. In Deckers, Muris, Roelofs, and Arntz' (Deckers et al., 2016), study, a group-based social skills treatment produced substantial social skills improvements in high functioning children with ASD. Most notably, the results generalized, and maintained for three months post intervention. White, Koenig, Scahill (White et al., 2010) evaluated a 16-week structured social skills group at an outpatient clinic to examine both the feasibility of treatment, as well as efficacy. The intervention proved feasible in implementation by parents and acceptable to students, while also effective for 9 out of 15 participants who displayed an increase in social motivation. However, it is important to note that all of the assessment and measurement conducted was largely indirect, using scales and interviews by teachers and parents, which may have added bias into the results and makes interpretation of the outcome data less objective.

Procedural Fidelity of Intervention Implementation

As with any intervention, group social skills treatments should require a high treatment integrity or procedural fidelity. Increased procedural fidelity yields better intervention effectiveness (Cooper, Heron, & Heward, 2007). Cooper et al. define procedural fidelity as, "the extent to which the independent variable is implemented or carried out as planned" (pg. 235). However, research on treatment integrity is not as widespread as it should be. McIntyre, Gresham, DiGennaro, and Reed (McIntyre et al., 2007) completed a literature review of school-based interventions in the *Journal of Applied Behavior Analysis (JABA)* from 1991-2005 indicated that only one third of the articles analyzed provided treatment integrity data in the form of implementation

percentage accuracy. More specifically, not many studies have been conducted on the treatment fidelity of those teaching group-based social skills training. This may be due to the fact that social skills training is a fairly new intervention or perhaps because the methods used by the therapists are less discrete in teaching such a vague and subjective skill. Bryson and Ostmeier (Bryson & Ostmeier, 2014), attempted to increase the effectiveness of group-based social skills implemented by teachers at a community mental health center. The intervention was anecdotally successful in increasing procedural fidelity of staff skills by up to 80%, through Applied Behavior Analysis (ABA) targeted training and follow-up coaching. However, the experiment was exploratory and mainly descriptive, failing to provide any quantitative or analytic evidence of effectiveness in changing behavior. Research demonstrates (Van Vonderen, Duker, & Didden, 2010), that high treatment integrity of the staff/therapists implementing the social skills intervention is necessary for the behavior change of the students.

In order to increase any target behavior of the therapists, there needs to be certainty that the individual is actually capable of performing the skills. According to Mager and Pipe (Mager & Pipe, 1997), if the individuals are not capable of performing the skills, the individual has a skill deficit and may need additional training or to be removed from the intervention entirely. However, if the individual is capable of performing the skill but is not doing it for some other reason, this can be described as a performance deficit. The reason for the low treatment integrity of staff, whether it is a skill or a performance deficit, should be assessed in order to find the most effective intervention. For example, a performance deficit can often times be improved with something as simple as introducing feedback to the individual's behavior. The authors

recommend anecdotal observations, flowcharts, and interviews, as a way to find the gaps in the performance and the reasons why the gaps are affecting performance.

Feedback to Improve Performance

One empirically-based intervention often used to improve staff performance is feedback (Alvero, Bucklin, & Austin, 2001; Balcazar, Hopkins, & Suarez, 1985). Parsons and Reid (Parsons & Reid, 2006), define performance feedback as, “descriptive information provided directly to a staff member about the quality or quantity of the staff person’s past work performance” (p. 71). Feedback can be one of the most effective tools for changing behavior and is right at the fingertips of the observer/supervisor without much cost (Daniels & Bailey, 2014). In Norman Peterson’s (Peterson, 1982) article, the author evaluates feedback and the debate regarding whether or not it can be treated as a principle of behavior, like reinforcement, or if it can be considered a class of stimuli on its own (such as a discriminative stimulus or as a conditioned reinforcer/punisher). In reality, feedback can act under multiple functions, and probably does so in most cases. Typically, the temporal distance between the feedback given and the individual’s behavior, as well as the infrequent measure in which feedback is delivered eliminates the notion that feedback functions as contingency-shaped behavior. Most feedback can be best described as a tool to target behavior and shape it into rule-governed behavior, or behavior maintained by a verbal statement of an A-B-C contingency controlled by temporally remote, yet significant consequences (Copper, Heron, & Heward, 2007). The author suggests that feedback is in need of a functional analysis in order to know why it works, as well as to help design a maximally effective type of feedback. Regardless of the stimulus function of feedback, it is a proven

intervention that has received much research in order to find the most effective and efficient methods.

There have been several extensive literature reviews on performance feedback delivered to staff. Hopkins and Suarez (Hopkins & Suarez, 1985), reviewed experimental applications of feedback in organizations with particular emphases on both distinguishing the effects of feedback from goal setting and behavioral consequences, and on any differential effectiveness of feedback as a function of the various feedback characteristics. The results of the review indicated that there is no type of feedback that is universally effective. The authors state that the difference in effectiveness comes down to its function as either a discriminative stimulus or as a behavioral consequence; they claim that a positive consequence will increase the chances of effectiveness of the feedback intervention. In addition, negative consequences (i.e., criticism or penalties) did not produce effectiveness, again indicating that positive consequences (i.e., praise or tangible reinforcers) will best improve behavior. Based on literature, the authors assert that the most effective system of functional differential consequences includes graphic feedback presented once a week with tangible rewards. In Alvero, Bucklin, and Austin's review (Alvero et al., 2001), the authors attempted to update the review by Balcazar et al. on the feedback literature in behavior analysis. The results indicate that feedback *alone* was the most common method of feedback; however, the most consistent effects were correlated with feedback plus antecedents (without goals). However, the authors were still unable to locate any research explicitly analyzing the function of feedback, prompting suggestions for future research in the realm of feedback.

As described in the literature reviews, there has been research conducted in an attempt to find the most effective types of feedback. Komaki, Barwick, and Scott (Komaki et al., 1978) noted a lack of research conducted in real-life settings, using single-subject design, while addressing the actual behaviors that result in occupational accidents. Komaki et al., applied a behavioral approach to occupational safety, pinpointing the behaviors of risk and providing an establishing operations that functioned as an effective means of motivating the workers to behave in a safe way using direct observational techniques. Using a multiple baseline across settings design, the results indicate that when the behaviors were pinpointed and positively reinforced (publicly) with consistent and frequent feedback, safety was substantially improved. Having the workers know exactly what behaviors they should be performing, rather than using generalized safety slogans, reflected the workers' own environment and could have contributed to its effectiveness. The positive reinforcement procedure was cost-effective; safe behaviors were maintained in the long-term and the social validity rating was high in regards to the staff acceptability of the intervention.

Video Feedback

There are several techniques for providing feedback in an attempt to change behavior, including video feedback, verbal feedback, graphic feedback, and self-management (Alvero, Bucklin, Austin, 2001). Video feedback is one form of performance feedback procedure that has been shown to be effective in changing the behavior in a wide range of settings and with a wide variety of subjects (Boyer, Miltenberger, Batsche, & Fogel, 2009; Downs, Miltenberger, Biedronski, & Witherspoon, 2015). One interesting behavior to which video feedback was applied and

proved to be effective was with martial artists. Benitez Santiago and Miltenberger (2016) evaluated the effects of video feedback on three acrobatic martial-arts skills. Using a video feedback procedure immediately after the regular class session, the intervention produced data that suggest that although the levels of behavior did not meet mastery criterion, exposure to the video feedback improved the acrobatic moves more quickly than regular class sessions. However, the increasing trend in the baseline for all participants suggests that a learning effect took place during the regular class sessions.

Kelley and Miltenberger (Kelley & Miltenberger, 2016) assessed the effects of video feedback alone on the behavior of horseback riders. Adding video feedback, embedded with positive reinforcement into a typical riding lesson, participants improved their riding positions substantially. Two major components of the intervention that may have contributed to the effectiveness are the immediacy and brevity of the feedback sessions, as well as the professionally developed task-analyses. However, due to the positive reinforcement of correct rider position, it is not possible to tell which component (reinforcement or video feedback) was most effective. In an attempt to avoid the limitations of the above study, there have been component studies conducted that showed that video feedback alone can be responsible for behavior change. Guadagnoli, Holcomb, Davis (Guadagnoli et al., 2002) examined the effects of video feedback on learning a golf swing. The video feedback was compared to verbal instruction with a coach and compared to self-guided practice using a group pre-test/post-test design. Despite the negative immediate effects seen in all conditions, follow-up tests showed long-lasting behavior change, indicating that the video feedback group was effective than the other two groups.

In addition to the various sports activities described above, video feedback has also been widely used in the organizational behavior management literature with the aim of improving and increasing workers' performance (Dawson, Dawson, & Forness, 1975; Loughrey, Marshall, Bellizzi, & Wilder, 2013). Pinter, East, and Thrush (Pinter et al., 2015) examined the effects of a video feedback intervention on the use of praise in the classroom. Results indicated that mean praise rates increased with implementation of the intervention, and teacher reports suggested a higher awareness of the students' behavior. Schools are not the only setting in which video feedback has been studied. In Noordman, Weijden, and Dulmen's (Noordman et al., 2014) study, the authors examined the effects of individual video feedback on the generic communication skills, clinical competence, and interviewing skills of experienced nurses. Results showed that nurses improved generic communication and motivational interviewing, but not competence, partly because of the high competence level of the nurses at baseline.

Most video feedback procedures, as in the studies above, have fairly similar protocols, which include performance being videotaped and then reviewed later by the individual and a supervisor. However, in Sigurdsson and Austin's (Sigurdsson & Austin, 2008) study, the authors examined the effects of a video feedback and self-monitoring component treatment package on postural behavior at a computer workstation using only the individual and a live-feed video. The authors note that most behavioral safety applications usually rely heavily on observation and peer-influence techniques; however, it is possible to have the same person as both the observer and the observed, through self-monitoring and self-evaluation. The procedure consisted of an information phase, to make sure that any changes post intervention were due to the independent variable and

not advanced knowledge of the target behaviors, followed by the visual video feedback and self-monitoring phase. Aside from productivity dropping 11%, the intervention was effective in improving safety performance for almost all targeted behaviors. This was the first OBM lone-worker study that focused on real-time video feedback as a source of self-monitoring data and repeated self-monitoring.

Video Feedback and Treatment Integrity

Video feedback has also been studied extensively in regard to its effect on the treatment integrity of those teachers/therapists providing direct services to children (Pelletier, McNamara, Braga-Kenyon, & Ahearn, 2010; Van Vonderen, Duker, & Didden, 2010). In Dowrick and John's (Dowrick & John, 1976) study, the authors evaluated the effects of video feedback on the behavior of therapists. Results indicated that the therapists reached 100% accuracy of performance and even noted that they didn't need to point out the mistakes since the mistakes were right in front of them. The authors focused solely on positive reinforcement for the correct behaviors. As mentioned above, the reason that good staff treatment integrity is important in the first place is so that the clients receive the most effective treatment. Van Vonderen, de Swart, and Didden (Van Vonderen et al., 2010) attempted to examine just that, evaluating the effectiveness of a training package consisting of instruction and video feedback on staff behavior. Most importantly, the study also examined the effects of the staff's intervention package on the behavior of the children. A procedure consisting of a baseline with verbal and written instructions, followed by the video feedback produced results that indicated that the intervention was effective in improving both the behavior of staff and the children. A lack of a component analysis called for future research.

In expanding upon the limitations and suggestions of Van Vonderen's 2010 study, Van Vonderen, Didden, and Beeking (Van Vonderen et al., 2012) examined the effectiveness of instruction and video feedback on the response prompting behavior of direct-care staff during one-to-one training. The authors noted that there has been little research that shows any data on the differential effectiveness of instruction versus video feedback, since most is included in a multi-treatment package. Following baseline, a meeting with staff included written and verbal instruction. Five sessions took place after this meeting in which no feedback was given. The next phase was video feedback, in which the supervisor and trainee watched the videotape of that day's session, and the supervisor administered feedback throughout. Follow-up consisted of the session being video taped without any feedback. Results indicated that video feedback alone was highly effective in increasing staff's correct behavior. This is important, since other studies have failed to provide a component analysis to show that video feedback alone is responsible for the improved behavior (Kelly & Miltenberger, 2016; Sigurdsson & Austin, 2008).

While video feedback has been proven successful in a wide range of empirical studies with many different behaviors, groups, and settings, it surprisingly is rarely used. Reid and Parsons (Reid & Parsons, 2006) note that video feedback allows staff to view their behavior moment-by-moment, through the same perspective that their supervisor views their behavior. For this reason, video feedback has the ability to provide the most detailed and objective information about an individual's performance in comparison to all other mechanisms of feedback. However, the authors note that its cost (in actually purchasing video equipment), time consumption (e.g., making, storing, and reviewing the videos), and reliance on the supervisors being present during the time in which the videos

are being reviewed, cause many settings to shy away from its use. As technology continually improves and video equipment becomes more easily acceptable, perhaps it will allow for more video feedback in real world settings.

Self-Monitoring

Self-monitoring is another type of feedback that has proved effective in changing behavior. Like video feedback, self-monitoring is not only used in educational settings and with children, but also with adults and staff members in a variety of professions. Rose and Ludwig (Rose & Ludwig, 2009) attempted to assess the effects of task clarification, self-monitoring, and performance feedback on the end of shift pool cleaning of nine lifeguards in three performance areas. The results indicated that the self-monitoring was effective in influencing the lifeguards' closing behaviors, in a low-cost, efficient method. However, there were several limitations, including a lack of experimental control.

Self-monitoring has produced mixed results in terms of improving the treatment integrity of staff members when implementing behavioral programs. For studies in which high treatment integrity wasn't reached during the self-monitoring phase, additional feedback components were considered. For example, Burgio, Whitman, and Reid (Burgio et al., 1983) developed and evaluated a staff management program that required more participation of the individual and less response effort of the supervisor, using self-monitoring, goal setting, self-evaluation, and self-reinforcement to increase interactions between staff and residents. The data suggested that improved behavior change was achieved in both staff and residents through the use of a participative feedback system without intensive supervisory participation. However, follow-up results did not result in

participants meeting the preset criterion for high levels of treatment integrity, indicating that modifications needed to be made to the follow-up procedure regarding the feedback components. Similarly, Richman, Riordan, Riess, Pyles, and Bailey's (Richman et al., 1988) study evaluated the effects of a self-monitoring procedure to increase staff on-task behavior and adherence to scheduled activities using minimal supervision. The intervention included an instructional in-service didactic training, a self-monitoring phase, and a self-monitoring/feedback phase. Results indicated that self-monitoring was effective in improving the behavior of the staff members. However, the behavior never reached the criterion for mastery during the self-monitoring phase, and when the behavior of some staff members began to drift, the experimenters added in a feedback component. Both of the above studies suggest that feedback will need to be a necessary piece of any effective intervention that addresses procedural fidelity and the durability of behavior change.

In contrast to the above self-monitoring interventions, those studies in which participants reached a high level of treatment integrity before implementing self-monitoring components observed behavior change that maintained high levels of fidelity over long periods of time. In Belfiore and Browder's (Belfiore & Browder, 1992), study, the authors demonstrated the impact of self-monitoring on instructors' data-based decisions evaluated through both teacher behavior and student progress. The participants had received classroom-based analog training and demonstrated an ability to produce high levels of procedural fidelity, but their behaviors were inconsistent until self-monitoring was implemented. The authors state that self-monitoring may have functioned to both prompt and reinforce appropriate staff behavior. Introduction of self-monitoring

produced an immediate increase in target behavior across all instructors, reaching and maintaining 100% accuracy. Similar to the above study's (Belfiore & Browder, 1992), use of self-monitoring after the individuals acquired a high level of procedural fidelity, Oliver, Wehby, and Nelson (Oliver et al., 2015) examined the effects of a self-monitoring checklist on teacher's use and maintenance of The Good Behavior Game (GBG). Self-monitoring was applied only after initial high levels of implementation accuracy were achieved, taught through didactic training and performance feedback. The data suggest that the use of a self-monitoring checklist produced long-term maintenance of teachers using the GBG in the classroom. The authors do note that the GBG is not a complex skill and suggest that further research on self-monitoring target a more complex behavior. Kern, Wacker, Mace, Falk, Dunlap, and Kromey (Kern et al., 1995) examined the effects of self-monitoring on a more complex behavior by targeting adolescent social skills, similarly to the skills being taught in this present study. The authors demonstrated the effects of self-evaluation on the peer interactions of students with emotional and behavioral disorders. The authors cite previous literature using video feedback and self-evaluation, but note a lack of a component analysis. A component analysis in their study of rewards, discussion, and self-evaluation of video feedback (and combinations of those) showed that the students' behavior improved most with a package of both self-monitoring and rewards.

Self-monitoring is, by definition, a feedback tool done without a supervisory role. However, it often needs to be paired with additional components in order to reach a high level of treatment integrity (Burgio, Whitman, and Reid, 1983; Richman, Riordan, et al., 1988; Kern et al., 1995). Reid and Parsons (Reid & Parsons, 2006) argue that the best

way to bring about changes in staff behavior is to combine feedback media and balance the positive and negative aspects of each individual component.

Examples of feedback combinations, particularly the combination of self-monitoring and video feedback, have been shown to produce behavior change in the past (Pelletier, McNamara, Braga-Kenyon, & Ahearn, 2010; Sigurdsson & Austin, 2008). Kissel, Whitman, and Reid's (Kissel et al., 1983) study commented on the lack of research examining both the training and the management components of staff training programs. Research on staff training regarding generalization, as well as the durability and maintenance of the skills learned, is limited. In addition, they note that self-monitoring has been studied as an effective way to improve generalization and maintenance, but has been the subject of little research. The purpose of their study was to evaluate a multi-faceted treatment package for teaching and maintaining behavioral training skills (e.g., brushing teeth) by institutional direct-care staff. Special attention was given to generalization, self-management, and session-by-session effects of the program. The first part of the intervention consisted of a training treatment, in which the authors taught the staff the appropriate behaviors through instruction, modeling, rehearsal, feedback, video modeling of a relevant and non-relevant task (to promote generalization), role-playing, and video feedback. Following the training, maintenance was evaluated through self-management and feedback provided throughout the sessions. Results indicated that the intervention was successful in teaching staff behavioral training skills and applying them in generalized situations, as well as in maintaining those skills while improving the behavior of residents. The authors note generalization as particularly important, as well as the self-management component, which demonstrates the ability to

fade out external supervision and create an ideal maintenance program. The authors also note that the gradual increase of the residents' behavior should be encouraging.

The combination of training and feedback packages is seemingly endless. Similar to the above study, Arco and Toit (Arco & Toit, 2006) assessed the effects of a combination of on-the-job feedback and self-monitoring after conventional analog training. Measuring both client and staff behavior, results indicate that although analog training was immediately successful in producing positive results, 75% of staff members needed the on the job feedback to reach competency and to avoid decreasing trends in target behaviors. This competency was maintained for periods ranging from 5-16 weeks, using self-generated feedback. In addition, the behaviors of the residents increased correspondingly.

Using a different combination of feedback, Guerico and Dixon (Guerico & Dixon, 2010) evaluated the effects of video modeling and feedback on staff interactions with clients. With a multiple baseline across participants design, baseline consisted of business as usual in which the experimenters rated their behavior, followed by the first phase of the video modeling, which consisted of the participant meeting with the behavior analyst (BA) to rate a video of their own behavior during baseline and rate a video of a clinical team member. The BA then provided verbal feedback regarding discrepancies between the two videos, as well as discrepancies between the BA's rating and the participant's rating. After the behavior stabilized following the initial meeting, the final phase consisted of the participant meeting with the BA to observe and rate a video after the initial meeting. Following this meeting, all observation sessions consisted of immediate, written feedback in the form of a rating. The data suggested that video feedback,

modeling, and the self-recording of behavior can improve the quality of interactions with residents.

The Present Study

The clinic in which the present study took place is a teaching clinic. Each semester, new college student therapists join the team in providing direct care to children diagnosed with ASD during social skills groups. A small clinic, with only 5 full-time staff members, means that each minute of the supervisor's day is valuable. While it is of high priority to ensure high treatment integrity from the therapists, the clinical director has expressed concern over the time commitment that feedback often takes. It has come to the director's attention that it is necessary to find a feedback tool that both increases the treatment integrity of the novice student therapists, while also supporting long-lasting behavior changes in both student therapists and children served in the clinic. Video feedback has been shown to be very effective for the acquisition of skills and raising the treatment integrity of staff members towards mastery (Dowrick & Johns, 1979; Pelletier, McNamara, Braga-Kenyon, & Ahearn, 2010; Van Vonderen, Didden, & Beeking, 2012; Van Vonderen, Duker, & Didden, 2010); however, it is a time consuming intervention and requires the involvement of supervisors in order to be implemented (Ried & Parsons, 2006). Self-monitoring has been shown as an effective intervention to maintain behavior, but often requires additional components for the skills necessary for mastery to be acquired (Burgio, Whitman, and Reid, 1983; Richman, Riordan, et al., 1988; Kern et al., 1995). The purpose of the current study is to evaluate the effectiveness of a video feedback and self-monitoring treatment package to both raise the treatment integrity of staff in a social skills group, and also maintain the behavior with minimal supervisory

input. The study attempts to answer the following research questions. Will the use of video feedback result in an increase in the treatment integrity (to a pre-specified criterion) of student therapists implementing prompting and instructional consequences in a social skills group session? Will self-monitoring be able to maintain the high treatment integrity after it is established in the video feedback phase? Will this be achieved within the time frame of the clinic's pre-scheduled semester?

CHAPTER 2

METHOD

Setting, Participants, Materials

This study took place at a non-profit clinic that specializes in instruction and therapy for individuals with ASD and developmental disorders in southeastern Pennsylvania. The clinic is considered a “teaching clinic,” meaning that undergraduate and graduate students (i.e., student therapists) volunteer and act as the therapists for the children. There are four full time staff members employed by the clinic who take on supervisory roles; they consist of one licensed clinical psychologist, two Board Certified Behavior Analysts (BCBA), and one Licensed Professional Counselor (LPC). New student therapists join the clinic every academic semester, while a few veteran student therapists opt to continue to volunteer throughout the year. Children (i.e. clients) at the clinic are aged anywhere from 2-years-old to older than 21-years-old. The clinic provides support for these students through preschool programming based in the science of Applied Behavior Analysis (ABA), a behavior-analytic feeding clinic, one-on-one behavioral therapy, and behavioral social skills groups. This study examined the treatment integrity of the student therapists in the social skills group only. Three undergraduate student therapists were recruited and enrolled as participants for this study, each with varying education background and experience levels.

Participants 2 and 3 were novice undergraduate student therapists, with educational backgrounds in social work and psychology. They had no formal training in ABA or in the principles of behavior prior to their experience at the clinic. This was their first semester as volunteers, and they worked primarily in the social skills group

department. Participant 1 was an undergraduate student as well, but was also employed as an assistant therapist at the clinic. During the study, she was obtaining her undergraduate degree in special education and had plans to attend a master's program for ABA in the next academic semester. She had the most experience of the three participants and had the responsibility of leading the student therapists and the social skills group. While Participant 1 had the most clinical experience with ABA, she had no formal behavioral education.

The social skills groups were held once every week for one hour. The clients (aged anywhere from 4-years-old to 15-years-old) were split up into three separate groups based on age and skill level. The social skills groups were located in two therapy rooms in the clinic. The rooms were square, lined with cabinets and shelves on two of the walls for storing and organizing the various materials, games, and toys used in working with the clients. One wall was equipped with a two-way mirror, with an observation room on the other side. The observation room consisted of chairs, a monitor, and a computer from which the cameras were controlled.

Each session was recorded using a previously installed video-recording system. Once manually started, the videos were saved onto the hard-drive of the computer for access at a later time. Due to many technical difficulties throughout the data collection period, three backup cameras were used during the sessions. These cameras included an iPad, an iPhone, and a Cannon Vixia HFM40, which were all mounted in the therapy room on tripods.

Dependent Measures

Target behaviors were based on student therapist behavior in delivering elements of the three-term-instructional contingency to clients during the social skills group in an effort to encourage social interactions between the clients. Cooper, Heron, and Heward (Cooper, Heron, & Heward, 2007), explain that this three-term contingency begins with a student therapist-delivered discriminative stimulus (SD) or an environmental antecedent that provides an occasion for a client's response. Following the client's response to the student therapist's discriminative stimulus, the three-term contingency ends with a student therapist-delivered consequence. A consequence either reinforces or punishes the client's preceding behavior and alters the frequency in which the behavior will occur again in the future. Specifically, the targeted behaviors of the student-therapists include the delivery of a demand (i.e., the antecedent discriminative stimulus) and either the delivery of reinforcement or an error correction procedure that follows the clients' response (the consequence). All behaviors were taught to the student therapists by the staff using an analog behavioral skills training package prior to the beginning of the social skills groups and prior to the intervention of this current study. Behaviors selected were the least functionally and topographically similar in order to avoid any carryover effects. In addition, the behaviors selected were the most important behaviors for student therapists to master, as expressed by the director and the assistant director of the clinic. The specific target behaviors were defined as follows:

Demand

Throughout the session, the student therapists provided demands to the clients. These demands act as the discriminative stimulus (SD) in the three term contingency in

which instruction occurs during the social skills group. The “demand” includes a demand (Come sit at the table), a greeting evoking a return greeting (Hi Adam!), or a question that demands for information (What should we do to let our friend come play with us?). This does not include facilitating play or conversation (“Let’s cheer on our friend while its his turn!; Who wants to go next?; I’m going to paint here, where are you going to paint yours?”). Facilitating play/conversation can be defined as a suggestion for the child without any follow-through of the therapist and is not included in the definition of this target behavior. The four behaviors that encompass a demand (SD) are broken down on the task analysis in which data is taken on and include:

1. The attention and/or eye contact of the client are gained. This means that any demand that is said while the client has the ability to hear or see the demand being placed is appropriate. If multiple people are talking and the client is facing the other way, the attention was not gained. If the room is quiet and the client is facing the wall when his name is called, the attention was gained.
2. The SD is stated one time.
3. The SD is stated clearly and concisely. The words are enunciated without mumbling at an understandable pace, with minimal wording. For example, a demand of “Hey Johnny, come to the table over here where we can sit down and start to work on our next really fun painting activity for a little bit” would not be considered clear and concise. A demand of “Come to table” is clear and concise.
4. SD is stated as a demand, not a question. This includes any instance of a student therapist asking a client to complete something (i.e., Would you come

to the table please?). This does not include a demand for information (i.e., What is your favorite color?).

Reinforcement

Following a correct or self-corrected response from a client, student therapists should provide reinforcement as a consequence of the client's correct response.

Reinforcement, as stated on the task analysis includes:

1. Reinforcement is delivered within three seconds of the correct response.
2. Reinforcement is behavior-specific. Behavior specific means that the behavior in which the student therapist is praising should be stated in the actual praise itself. For example, if the client was asked to touch his nose, the behavior specific praise would be, "Great job touching your nose!" The reinforcement type should be in congruence with the behavior plan of the client. This means that reinforcement will look topographically different based on the goals of the client. For example, this may be verbal praise for one client and a star on a token board for another client.
3. Reinforcement has a positive intonation. For example, verbal reinforcement is stated with a raised pitch voice, a smile, and with an upward inflection at the end of the words and sentences.

Error Correction

Following an incorrect response or non-response from a client, student therapists should provide an error correction procedure until the correct response is delivered. This error correction procedure looks like:

1. An informational “try again” is delivered immediately, within three second of the incorrect response or non-response.
2. The informational “try again” is stated clearly with a neutral intonation. For example, after the incorrect response, “try again” is stated without a smile, and a neutral resting face, using an authoritative tone. This does not include “try again” stated with a frown or furrowed brows, nor with a loud aggressive tone.
3. The new trial with the next prompt is immediate. After the “try again” is delivered, the new trial begins immediately. This means that the same SD is stated again using a least-to-most prompt hierarchy.
4. The correct prompt is used with the new trial. For example, the first demand will have been stated without any prompting, allowing the client to respond independently. If the client fails to provide a correct response within three seconds, the student therapist immediately delivers the “try again” and immediately states the SD again with an accompanying prompt in accordance with the prompt hierarchy.
5. If additional trials are needed, the student therapist moves up the correct prompt hierarchy. If the client continues to provide an incorrect response, the student therapist should repeat the procedure, moving up the prompt hierarchy if needed. Depending on the SD delivered by the student therapist, the prompt hierarchy differs slightly. For example, a demand evoking a verbal response will require the student therapist to follow the verbal hierarchy. The verbal hierarchy, from most to least, is: full verbal, partial verbal, visual, gesture, and

independent. A demand evoking a physical response will require the student therapist to follow the physical hierarchy. The physical hierarchy is: full physical, partial physical, model, verbal/visual, gesture, and independent.

Data Collection

Observations took place twice per week (Tuesdays and Thursdays) during baseline and once per week during the intervention (Thursdays only). The decision to collect data only once per week during the intervention was multi-faceted. Firstly, video feedback only occurred after the Thursday group due to the availability of the first author. Secondly, during the sixth week of data collection, it became clear that the target behaviors for the current study were no longer applicable or appropriate for the Tuesday group. The clients in the Tuesday group were older and had specific behavior plans that prevented the student therapists from delivering reinforcement and the error-correction in the way in which the target behaviors defined them. Each social skill group lasted one hour, during which the video cameras recorded all interactions. Observations covered all 15 pre-scheduled weeks of the social skills group.

The first author acted as the primary observer. She had previously volunteered at the clinic and was familiar with one of the participants. During the observations, the first author sat in the observation room behind the two-way mirror to observe the session. The student therapists were aware that all sessions in the clinic were video taped and could be observed for supervisory information and data collection purposes at any time. Student therapists were also aware that the first author was observing, but were not given any additional information regarding treatment integrity or the purpose of the study, except

for general information given during informed consent (e.g., video will be taken of the sessions and each participant will watch their performance while receiving feedback).

Data collection consisted of a checklist containing elements all from the definitions described above. A maximum of 30 minutes or 10 trials was used as the observation period, but only a minimum of one trial was needed. Continuous measurement was used for the first 30 minutes of opportunities for the target behavior. A percentage of correct responses was calculated from the data. For example, it was the number of times the staff used the correct prompt hierarchy compared to the number of times the staff should have used the correct prompt hierarchy, multiplied by 100. The same checklist was used for primary data collection during all phases of the intervention, as well as for IOA data collection (see Appendix A for complete checklist). A (+) was recorded on the checklist to show that the behavior was displayed accurately and a (-) was recorded on the checklist to show that the behavior was not displayed accurately or not displayed at all.

The first author collected baseline data after each social skills session via videotape until the data were stable. This was done without the student therapists being present. Data for the video feedback phase (i.e., VFB) and the self-monitoring phase (i.e., SM) were collected and graphed after the each session. The data were collected until the target behavior was steady at or above treatment integrity. The first author watched the videos alone in the observation room, monitoring one participant at a time.

IOA, Procedural Fidelity, and Observer Training

Inter-observer agreement data (IOA) were calculated using the trial-by-trial method, which is often used for discrete trial data. Cooper, Heron, and Heward (Cooper,

Heron, & Heward, 2007), explain that total count IOA for each item will be calculated by dividing the number of agreements over the total number of agreements plus disagreements, multiplied by 100 to give the percentage of observer agreement. An agreement is defined as both the first observer and the second observer having the same recording (either + or -) in the same trial.

Three individuals acted as the IOA observer in order to take both IOA data and procedural fidelity. Observer training for IOA consisted of the first author giving the IOA observer information on the target behavior definitions, including examples and non-examples. The IOA observer was then instructed on how to fill out the checklist using the (+) and (-) recordings. After the IOA observer felt confident in her understanding of the target behaviors, both observers watched video sessions of past social skills groups in order to fill out the checklist with the target behaviors of the present study. The observation sessions lasted no longer than 15 minutes. When both the first author and IOA observer reached at least 80% agreement on a minimum of three videos calculated using total count IOA, the IOA observer reached the mastery criterion needed in order to for IOA data collection. Observer training for procedural fidelity consisted of the first author giving the IOA observer the procedural fidelity checklist, describing how each item should look and giving examples.

The IOA procedure consisted of the IOA observer independently watching the videos of the sessions and comparing her checklist to that of the first author. The sessions in which IOA data were collected was based on the availability of the IOA observers. IOA was assessed for 40% of all phases; 33% for each participant during baseline, 60% for each participant during the VFB phase, and 25% for each participant during the SM

phase. Mean agreement for Participant 1 was 62% and 53% during baseline, 100%, 87%, and 92% during VFB, and 100 % during SM. Mean agreement for Participant 2 was 96% and 46% during baseline, 100%, 73%, and 100% during VFB, and 100% during SM. Mean agreement for Participant 3 was 72% and 95% during baseline, 55%, 78%, and 92% during VFB, and 82% during SM.

Procedural fidelity was assessed for 33% of the intervention phases (both the VFB and SM phases). This procedure consisted of the second observer watching the first author deliver feedback to the participants after each session in both the VFB and SM phase, completing a checklist for the behavior of the first author. This checklist included behaviors leading up to the feedback, a script of what the first author would say during feedback, and what would be required of the participants during feedback (see Appendices B and C for both the VFB and SM procedural fidelity checklist). Mean procedural fidelity accuracy was 96% and 98% during VF and a mean of 100% during SM.

Procedure

Pre-Intervention Analog BST

Student therapists took part in a clinic-wide training for the first few weeks as volunteers. The trainings, led by the clinic's staff members (as is standard clinic procedure), used behavioral skills training (BST) consisting of verbal instruction, written instruction, modeling, and role-playing. Topics covered during the BST included an introduction to ABA, the three-term-contingency and discrete trial, behavior management, and graphing techniques.

Assessment

Using Mager and Pipe's (Mager & Pipe, 1997) "Analyzing Performance Problems" flowchart, a behavioral assessment was conducted on the current behavior of the student therapists. These authors state that through anecdotal reports and observations, it is possible to find out where the gaps and barriers exist that prevent the student therapists from performing to mastery criteria. Using a modified interview based off of Mager and Pipe's (Mager & Pipe, 1997) performance analysis flowchart, which acts as a guide in order to find the root causes of the performance deficits, anecdotal observations were collected. Interviews of the assistant clinical director, the BCBA, and Participant 1 (as she was a veteran staff familiar with staff performance issues) were used to assess the current behavior deficits.

The flowchart asked whether or not fast fixes could be applied, such as making expectations clear or providing adequate resources. All three interviewees agreed that expectations had been made clear and resources were adequate, however Participant 1 was the only interviewee who claimed that performance quality was not visible, meaning that there was no visible indication of the accuracy of their performance. The flowchart also asked about the contingencies that control the student therapist behavior to see if appropriate behavior is actually punishing while the inappropriate behavior is unintentionally reinforcing. All three interviewees stated that the desired performance was not punishing, but Participant 1 noted a lack of immediate consequence following appropriate behavior. In assessing the possibility of a skill deficiency (instead of a performance deficit), all three interviewees agreed that the target behaviors are skills that have been used often in the past, therefore eliminating this possibility. According to the

results of the flowchart interview questions, the authors recommend that feedback be implemented as a solution to the problem behaviors, as opposed to a fast fix or a contingency rearrangement.

In addition to the anecdotal reports, data were taken through observations using a checklist (the same checklist used across all phases) to determine the level of treatment integrity performed by the student therapists following the analog BST and to assure that the target behaviors of this study had been covered during the training period.

Observations consisted of the student therapists role-playing a three-term-contingency, with the clinic staff acting as a non-compliant child, while the first author watched and filled out a checklist using either a (+) or (-) to show correct/incorrect student therapist behavior. Using both the flow chart and the observations, those student therapists who showed a skill deficit (as defined as below 80% treatment integrity during role plays) would have moved into additional training sessions using video-feedback in order to reach an 80% level of treatment integrity before working with the clients and obtaining baseline data. Those student therapists who were at 80% treatment integrity post-training were not required to partake in additional training with video feedback, and instead moved on to working with the clients while baseline data were collected. In the present study none of the participants performed below 80% via observation of the role plays, so all moved directly into baseline. However, had a participant not reached the mastery criterion of 80%, additional one-on-one training sessions using role play and video feedback would have taken place until the mastery criterion was met.

Baseline

Data were collected on the target behaviors of each staff during the social skills sessions with clients, following the analog BST training. During Baseline, the staff provided feedback to the student therapists as they have typically done in the past, which included both immediate and delayed verbal feedback, both in the session and afterwards. The stability criterion for baseline was defined as three data points that did not deviate more than 10 percentage points from the mean or three data points showing a decreasing, counter-therapeutic trend. Once a stability criterion was met for all participants, the VFB intervention began.

Video Feedback Intervention

During the VFB phase, verbal feedback from supervisors continued as during Baseline. Introduction of the video feedback component was staggered across behaviors according to a multiple baseline design. The first target behavior for participants was chosen based on their lowest scoring behavior during baseline. For example, Participant 1's first target behavior was the delivery of reinforcement as it was the lowest percentage of accuracy of all three behaviors, whereas Participants 2 and 3 had the delivery of the error-correction procedure as their first target behavior because of their low percentage of accuracy for that behavior.

Participants were filmed for the entirety of the social skills group session. Immediately after the session ended, the first author re-watched the video of the session, collecting data via the checklist on one participant at a time. Observation periods were a maximum of thirty minutes long and the data were calculated as a percentage of

opportunities. Each trial observed was time-stamped on the checklist so that the first author could go back to specific trials during the video feedback to the participants.

After the first author finished coding the videos, the participants individually went into the observation room with the first author, for no more than thirty minutes, to watch the recording of the session they just taught. Two trials from the first author's time-stamped observation were chosen to show to the participant. If possible, the first author first showed a trial in which improvement was needed, following a trial in which the student therapist displayed correct behavior. Independently and simultaneously, the first author and the student therapist filled out the task analysis while watching the two trials via video, watching the trials as many times as the participant requested and offering any assistance in filling out the checklist. As with the first author's observation, a (+) or a (-) represented whether the student therapist behavior occurred at each opportunity for behavior. The first author and participant then compared checklists and re-watched the trial with verbal commentary.

The first author commented after each trial to praise for correct behavior, praise for correctly identifying the incorrect behavior, and provide corrective feedback on behaviors that were incorrect/inaccurately identified. For those behaviors that were performed correctly and accurately recorded by the therapist, praise was provided by saying, "Great job on the _____! That was perfect!" For those behaviors that were performed correctly but not were accurately recorded by the therapist, the first author pointed out the correct behaviors and provided praise. For those behaviors that were performed incorrectly, but were accurately recorded by the therapist, the first author praised the recognition of the incorrect behavior and provided corrective feedback. For

those behaviors that were performed incorrectly and were not accurately recorded by the therapist, the first author provided corrective feedback. Corrective feedback included what the therapist did, what the therapist should have done, and how to do it in the future. This feedback may have included modeling/role-playing, but it was not required.

Self-Monitoring Intervention

Again, verbal feedback by supervisors continued through this phase. Once the mastery criterion was met during the VFB phase, SM was systematically applied across participants and behaviors. Student therapists still watched a video of their performance, but VFB no longer occurred for the behavior that was now in the SM phase. Student therapists continued to fill out the checklist after each social skills group session, depicting whether or not they believed that they had performed the behaviors according to the operational definition. For example, when Participant 1 watched a trial during the VFB session for her second target behavior, she filled out the checklist for the first and second target behavior. She received video feedback on the second behavior, but not on the first behavior, since that behavior had been moved to self-monitoring. There was no additional feedback for the behavior in the self-monitoring phase other than praise for completing the partaking in the self-monitoring process. Data were collected until the behavior was stable or depicted a stable trend.

Design

A multiple baseline across behaviors was used with three participants in an effort to evaluate the effects of VFB and SM on student therapist behavior. Following an analog BST, student therapists were evaluated for treatment integrity accuracy. Those student therapists above 80% treatment integrity accuracy of the target behaviors post-training

moved into the baseline data collection phase during the teaching of social skills groups. A visual analysis was conducted each week to determine the status of the student therapists until a stable trend emerged. The stability criterion for baseline was defined as three data points that did not deviate more than 10 percentage points from the mean or three data points showing a decreasing, counter-therapeutic trend. Once the stability criteria were met for all participants, the VFB intervention began. The VFB phase was systematically applied to each participant for the delivery of a demand, the delivery of reinforcement, and the delivery of an error-correction procedure. The target behaviors selected to begin with for each student therapist were based on the behaviors with the lowest percentage of accuracy during baseline (e.g. the first target behavior selected for each student therapists was their lowest scoring behavior in baseline, the second target behavior selected for each student therapists was their second lowest scoring behavior in baseline and the third target behavior was selected as their highest average behavior during baseline). For Participants 2 and 3, their mastery criterion was 80% accuracy over three consecutive trials. However, for Participant 1, a mastery of criterion of 90% over three consecutive trials was more appropriate considering her experience and her baseline data that had already reached 80% on multiple occasions. Once mastery criteria had been met in VFB, that target behavior moved into the SM phase and the next target behavior began receiving video feedback. The time constraints of the study did not allow for maintenance data nor follow-up probes to be taken. At the end of the pre-scheduled 15-weeks, the student therapists' academic semester had ended and their commitment to the clinic was finished. IOA data and procedural fidelity data of the first author were taken throughout all conditions, for 40% and 33% of all sessions, respectively.

Social Validity

A social validity questionnaire was distributed to each participant on the day of the final datum point/social skills group session. The questionnaire was a modified version of Kissel, Whitman, and Reid's (Kissel et al., 1983) social validity assessment, using 15 questions and a likert scale to gauge acceptability, likability, and perceived effects on the student therapists. In addition, there was an open-ended space for the student therapists to write any additional comments about the intervention. The questionnaires were emailed to each individual in order to avoid any reactivity of the first author being present. Since some of the student therapists knew the first author personally, it is possible that the student therapists could have given an inaccurate representation of their thoughts regarding the intervention in an attempt to avoid offending anyone. Questionnaire results indicated that student therapists believed that the VF and SM helped them to improve their behavior and that they liked the intervention, however they were neutral to having their behaviors video taped and watching their own performance. One participant did not feel that the SM phase of the intervention helped to maintain her behavior.

A second questionnaire was distributed to the staff members of the clinic on the final day of data collection. This set of questions, also on a likert scale, spoke more directly to the purpose of the study and their views on its worth. Staff members indicated that the intervention moderately enhanced the treatment integrity of the student therapists and contributed to the progress of the clients. It was noted that they liked the intervention and thought it was worthwhile, but were neutral regarding whether this particular feedback was preferred to any other feedback method. However, one staff member did

write that she planned to use VF and SM again in the future (see Appendices D and E for both the participants' and clinic's social validity assessment in full).

CHAPTER 3

RESULTS

The results of the intervention indicate the effectiveness of the VFB and SM applied to three participants across three separate behaviors and can be seen in Figures 1-3, for Participants 1, 2, and 3, respectively.

Results indicate that the VFB and SM intervention was the most effective for Participant 1 (the experienced student therapist), moderately effective for Participant 2, and not effective for Participant 3. The first datum point in Figures 1, 2, and 3 represent the analog-BST accuracy score; All three participants demonstrated the skills during the role-playing scenario at above 90% accuracy. This indicates that the skills were a performance deficit rather than a skill deficit. Individuals were capable of performing the skill, but failed to do so for a different reason (e.g., motivation).

Baseline for all three participants displayed both variable and insufficient levels of treatment integrity. VFB was implemented once each participant's baseline reached stability criterion. Data during the VFB phase showed an immediate and notable behavior change for Participant 1 and an immediate but slower change for Participant 2. Data throughout the VFB phase for Participant 3 was variable and never reached mastery criterion. SM was implemented once each participant's behavior reached the predetermined criteria during VFB. After implementing the SM intervention, Participant 1 saw maintenance of treatment integrity at the predetermined criterion, while Participant 2 saw a slight drop in accuracy level yet still maintaining mastery for 75% of data points. SM did not produce any immediate or notable results for Participant 3. A more detailed description of the results for each participant follows.

Figure 1. Effects of Feedback on Participant 1

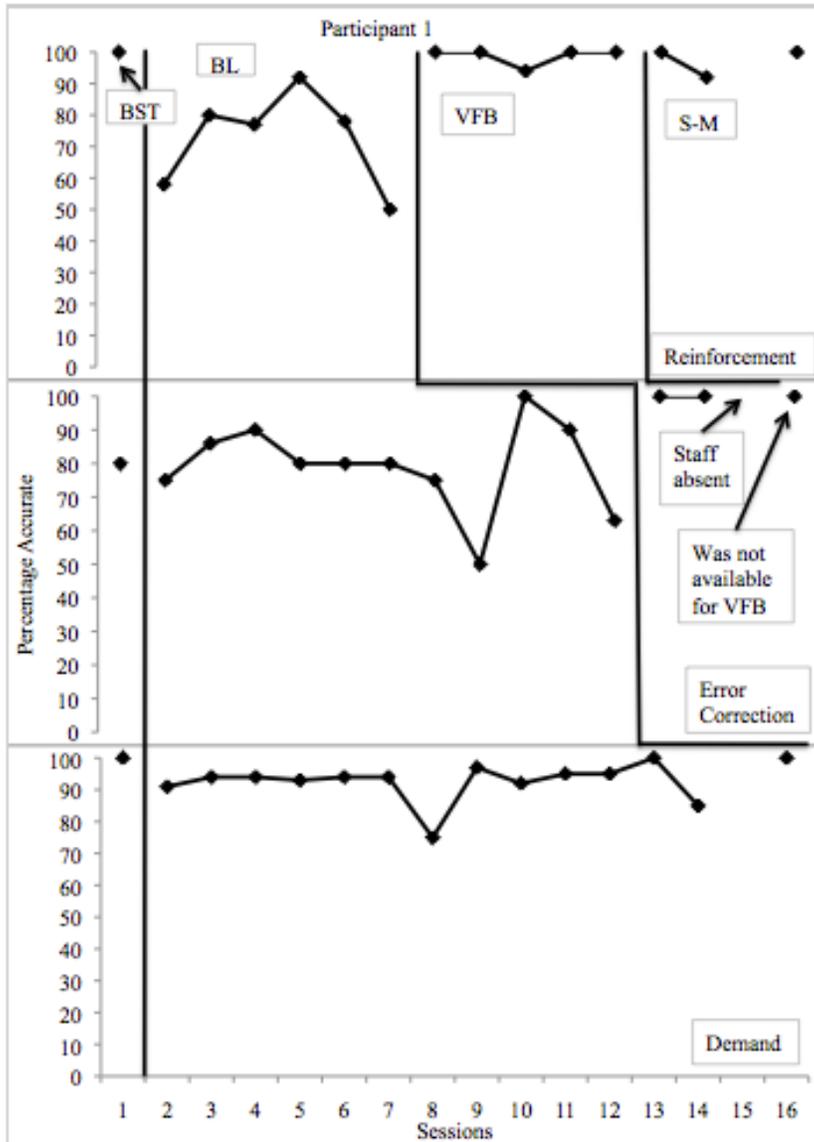


Figure 1. Percentage of treatment integrity accuracy following the implementation of VFB and SM for Participant 1 for three target behaviors: reinforcement (top panel), error correction (middle panel), and demand (bottom panel). Participant 1 was absent for Session 15 and was unavailable for feedback prior to the social skills group for Session 16.

Figure 2. Effects of Feedback on Participant 2

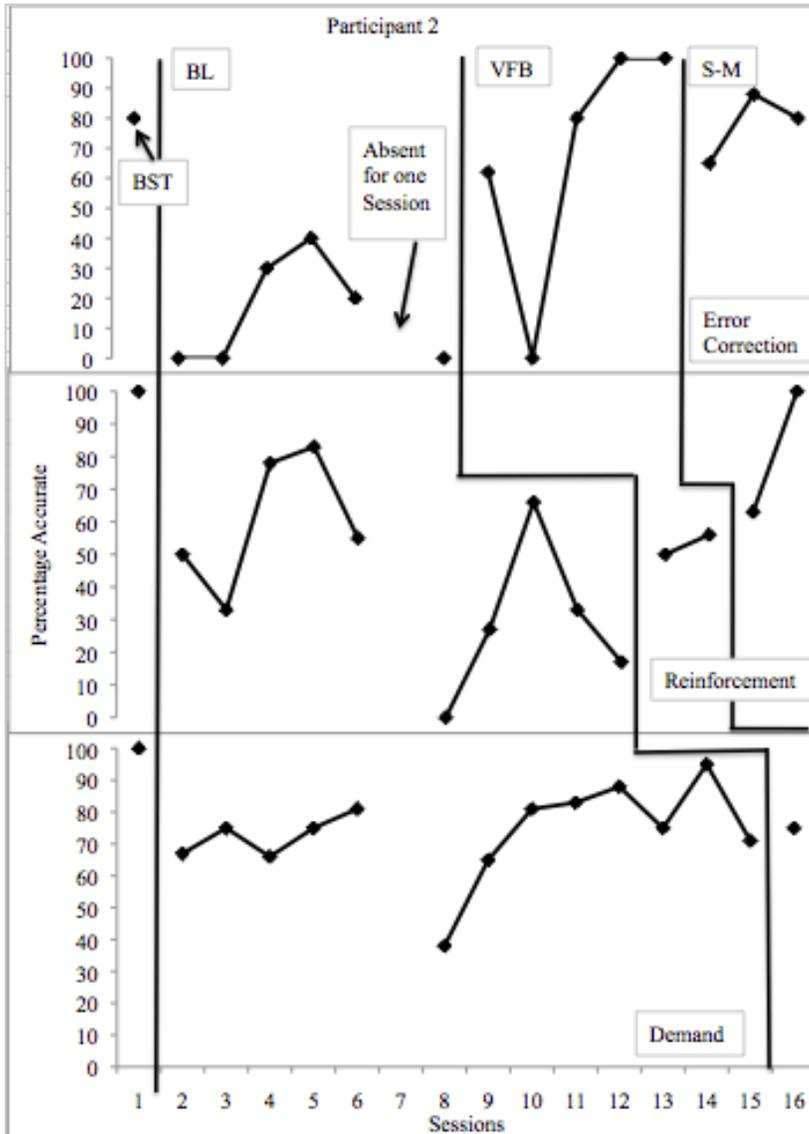


Figure 2. Percentage of treatment integrity accuracy following the implementation of VFB and SM for Participant 2 for three target behaviors: error correction (top panel), reinforcement (middle panel), and demand (bottom panel). Participant 2 was absent for Session 7 and no data was collected.

Figure 3. Effects of Feedback on Participant 3

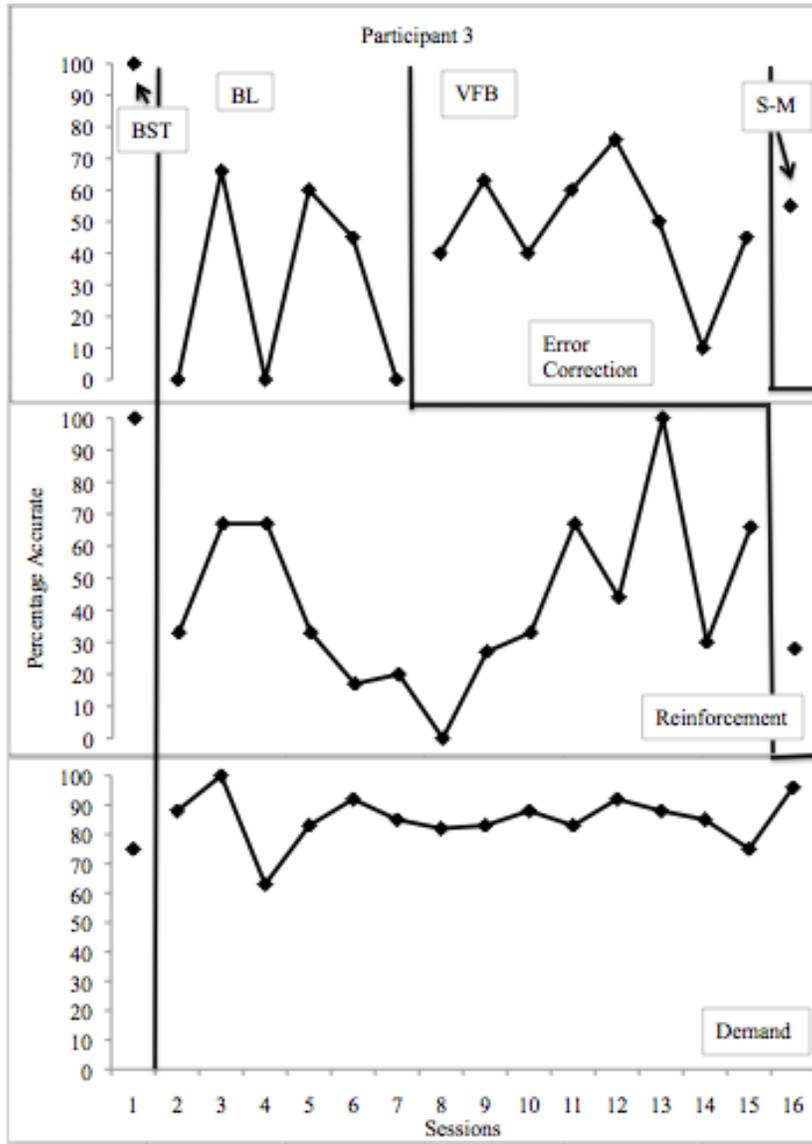


Figure 3. Percentage of treatment integrity accuracy following the implementation of VFB and SM for Participant 3 for three target behaviors: error correction (top panel), reinforcement (middle panel), and demand (bottom panel).

Participant 1

Baseline data for Participant 1 were a mean of 73% for reinforcement delivery, 79% for error correction, and 93% for demand delivery. Participant 1's baseline data for reinforcement delivery seemed to be moving in an upward trend; however, the data displayed a counter-therapeutic trend for the last two data points. Baseline data for error correction were stable for the first seven data points before once again displaying a counter-therapeutic trend over the last two data points. Baseline data for demand delivery were fairly stable, ranging only from 75%-100%, with the exception of two outliers. It was after a visual analysis of Participant 1's baseline data for all behaviors that her mastery criterion was moved up from 80%, like the other two student therapists, to 90%. With nearly all three of Participant 1's target behaviors already hovering around the 80% mastery criterion, it became clear that this experienced participant should have different expectations than the other novice therapists.

After observing the downward trend in Participant 1's baseline for reinforcement delivery, video feedback (VFB) was implemented, and resulted in an immediate and substantial behavior change. The data for reinforcement delivery rose to 100% of steps implemented correctly (above mastery criterion of 90%) on the first datum point after VFB was implemented and the improvement was maintained for five data points. The percentage of non-overlapping data points for reinforcement delivery is 100%, indicating a very effective intervention. Although the first target behavior reached mastery criterion by the third datum point, the SM intervention was not implemented in order to ensure that the small drop in the third datum point was not a decreasing trend. In addition, at this time, data were also being collected for Tuesday social skills groups. However, it was

determined that since Tuesday's social skills groups were with different clients (with different behavior plans) than those included in the videos used for video feedback, the intervention was not likely to have an effect on these sessions. It was then determined that data from these sessions should not be included in the data analysis. It was only after we eliminated those data that it became obvious that this behavior would meet the criterion to implement the next phase of the study earlier.

Much like Participant 1's data on reinforcement delivery, VFB was implemented after observing a decreasing trend in the baseline for error correction, causing an immediate behavior change. The data rose to 100% of steps performed correctly on the first day of the intervention and maintained that high treatment integrity for the remaining sessions, despite her being absent for one session and unavailable for VFB prior to the final datum point. The PND for the intervention implemented on the error correction delivery is 0% because she had reached 100% in baseline one time. The study was concluded before the intervention could be applied to the third behavior (demand delivery), due to the end of the social skills group sessions at the clinic.

Due to time constraints, the SM intervention was only implemented on Participant 1's first target behavior (reinforcement delivery) for three data points, after reaching the preset criterion. However, those three data points remained above the criterion for 100% of the phase. A PND of 66% (calculated comparing baseline and SM) indicates that the SM was ineffective; however, that may not necessarily be true considering that the low PND percentage is a result of an outlier datum point in baseline that reached 92%.

Participant 2

Baseline data for Participant 2 had a mean of 15% for error correction, 44% for reinforcement delivery, and 75% for demand delivery. She was absent from the clinic on the seventh session, so no observations could occur. Following the absence on the seventh session, the next session's datum point was the lowest for all three behaviors. Participant 2's baseline data for error correction moved in an upward trend for the first four data points, but fell in a counter-therapeutic trend for the last two data points. Despite a lack of stability, this resulted in the decision for the intervention to begin for this behavior. Her baseline data for reinforcement delivery were variable throughout the entire condition, ranging from 0% to 83%. Like error correction, a counter therapeutic trend was observed in the final two data points of the baseline for reinforcement delivery. Participant 2's baseline data for the demand delivery was the most stable out of all of the target behaviors, moving in an upward trend except for an outlier following the participant's absence.

After observing a downward trend in Participant 2's baseline data for error correction, VFB was implemented and the data displayed an immediate change, though not as large as Participant 1's behavior change. Increasing from 0% to 60% on the first day of the intervention, the behavior fell back down to 0% before displaying an increasing trend towards the preset criterion. The PND for this intervention was 80%, indicating that the treatment was effective. Although we did also see the levels of treatment integrity of the other two behaviors also rise upon implementation of the VFB on the first target behavior, the rise was not dramatic, nor did it sustain.

Similar to Participant 2's error correction, after observing a decreasing counter-therapeutic trend in Participant 2's baseline data for reinforcement delivery, VFB was

implemented and resulted in an immediate effect on the first datum point of the intervention. The data during intervention increased by 33 percentage points over baseline. However, a PND of 0% indicates that the intervention was not effective in changing the data, due to the high amount of variability during baseline. Unfortunately, due to time constraints, the decision was made to implement the SM phase on reinforcement delivery despite the VFB data not reaching mastery criteria, in order to see if the interventions would affect all three behaviors.

When VFB was implemented with demand delivery, it resulted in a less dramatic change. Although still an increase in behavior, the data only increased from 71% to 75%. Again, a PND of 0% indicates that the intervention was not effective in increasing the treatment integrity due to the variability in the baseline phase.

The SM phase was only conducted with Participant 2's first and second target behaviors: error correction and reinforcement delivery. After reaching the preset criterion in the VFB phase of error correction, the SM intervention was implemented. The implementation of the SM phase resulted in an immediate drop in the accuracy of treatment integrity by nearly 35 percentage points. However, the behavior displayed an upward trend over the next two behaviors, maintaining the behavior at and above the preset criterion, and displaying a 100% PND (calculated by comparing baseline and SM data).

Again, due to time constraints, it was decided that the SM phase was to be implemented on reinforcement delivery, despite the data not having reached the preset criterion during the VFB phase. This preemptive move was done in an effort to apply the intervention to all three behaviors before the 15-week schedule was complete.

Interestingly, not only did the data display a rise in treatment integrity following the implementation of the SM on reinforcement delivery, but it also reached the preset criterion of 100% accuracy on the last datum point. A PND of 50%, calculated by comparing the baseline and SM data, indicates an only modestly effective treatment. Unfortunately, with a lack of follow-up data, it is not possible to analyze the maintenance of this high procedural fidelity.

Participant 3

Baseline data for Participant 3 was the most variable out of all three participants. A mean of 29% for error correction, a mean of 43% for reinforcement delivery, and a mean of 86% for demand delivery were observed. Baseline data for error correction did not become stable before implementing VFB, but a counter-therapeutic trend was observed in the last three data points. No trend, nor stability was observed for baseline of reinforcement delivery. Demand baseline reached stability criterion on the seventh datum point, but VFB could not be implemented, as the first two behaviors had not met criterion yet.

Like the other two participants, after observing a decreasing trend in Participant 3's baseline data for error correction, VFB was implemented. The affect on the data was immediate, though not large, and the treatment integrity never reached the preset criterion. The data increased from the baseline level of 29% to a level of 44% during VFB; however, it remained variable, ranging from 10% to 76% of steps implemented correctly. A 13% PND indicates a unreliable change from baseline. There did seem to be a rise in Participant 3's treatment integrity of reinforcement delivery during baseline as

the VFB intervention was implemented for error correction, causing concerns regarding carryover effects.

Despite never reaching the preset criterion for error correction, nor reaching a stability criterion for the baseline data for demand delivery, due to time constraints and in an effort to apply the intervention to as many behaviors as possible, the next phase of the study was implemented. Following the implementation of the VFB on reinforcement delivery, there was an immediate decrease in treatment integrity and the PND was 0%. With only one datum point available for analysis, it is not possible to make a judgment on the true effect of the intervention on this behavior. The study was concluded before the intervention could be applied to the final target behavior (demand delivery).

With a lack of time and a behavior that never met mastery criterion during the VFB phase, the SM phase was implemented for only one datum point on the first target behavior (error correction delivery). Again, this was to give the intervention the opportunity to come into contact with as many behaviors as possible. The effects of the SM produced a slight increase in treatment integrity from the previous datum point; however, it was not a big enough increase to set it apart from the variability of the data during the VFB phase. This is likely the reason that the PND was calculated to be a score of 0%, from baseline to SM data.

CHAPTER 4

DISCUSSION

The findings of this study show that video feedback (VFB) was effective at raising the treatment integrity, to a pre-specified criterion, of student therapists implementing prompting and instructional consequences in a social skills group session for two out of the three participants. The VFB portion of the intervention seemed to work best for the experienced student therapist (Participant 1), as indicated by the immediate and large increase in treatment integrity after the first day of VFB implementation for the first two target behaviors (reinforcement delivery and error correction). It was as if the moment she saw the video, she was immediately able to identify what was incorrect and apply that feedback from that point forward. Like Komaki, Barwick, and Scott's (Komaki et al., 1978) study of occupational safety, actually pinpointing the behaviors of target instead of vague feedback was influential in behavior change. Perhaps because of her experience and familiarity with Applied Behavior Analysis (ABA), once she received the VFB and the behaviors she needed to improve upon were pinpointed, she knew how to change her behavior immediately. As for the novice student therapists (Participants 2 and 3), the VFB was only effective for Participant 2, which produced a more gradual behavior change, although still immediate. While Participant 3 never reached mastery criterion during VFB, carryover effects were observed, indicated by a rise in level during the second half of the baseline data for reinforcement delivery. While carryover effects are not desirable during applied research, as it weakens the internal validity of the study, the ability to positively change as many behaviors as possible in as short of time as possible is something that would benefit the clinic, if indeed it were the intervention that created

this change. Future research would need to determine the effects of generalization of the VFB intervention. In addition, the data indicate that self-monitoring was able to maintain the high treatment integrity after it was established in the video feedback phase for two out of the three participants. The same patterns arose in both the VFB and the SM phase: the interventions were effective for the experienced participant, while the interventions were moderate or ineffective for the novice participants.

In regards to the practical applications of the VFB and SM intervention of the present study, feedback was implemented without any interruptions to the normal clinic schedule, other than the need for someone to be available in order to watch the videos and deliver the feedback. Even more so, once the SM phase was implemented, it took even less commitment from the individual delivering the feedback. This is something that could very easily be added to the clinic's routine practices. It seems that the intervention, as is, would be best applied to those individuals with some experience with the target behaviors; in this case, experience with ABA could have been a beneficial component. However, in analyzing whether this intervention was able to achieve the high treatment integrity and maintenance goals within the time frame of the clinic's pre-scheduled semester, it seems that the intervention was not effective in this regard. No participants were able to reach a high level of treatment integrity for all three behaviors during the academic schedule. Research (Cooper, Heron, & Heward, 2007), states that increased treatment integrity yield better intervention effectiveness. Considering that it is imperative for therapist behavior to reach high levels of accuracy in order to ensure the most effective treatment for the clients receiving the services, it would seem necessary that the behavior change happen well within the pre-scheduled 15-week semester so that

the clients are able to come into contact with the effective treatment (Van Vonderen, Duker, & Didden, 2010). This is an issue that will be addressed further within the discussion of future research suggestions. Despite the intervention's positive effects on behavior for two out of three participants, some limitations should be noted and taken into consideration.

The clinic in which the present study took place operates under the academic semester and is confined to a 15-week schedule for the social skills groups. This means that the present study was also required to take place within the academic semester and the time constraint did not allow for any flexibility; after the 15th datum point, the participants would no longer be at the clinic. Towards the end of the academic semester, it became clear that the participants would not reach the preset criteria fast enough in order for the intervention to be applied to all three behaviors. It was decided that the SM phase would be applied to participants, despite the preset criteria not having been met during the VFB phase. This was done in an effort to ensure that the interventions could be applied to as many behaviors as possible. Unfortunately, this means that for all of Participant 3 and for the last behavior of Participant 2, the internal validity of the study is weakened. Since the therapists never reached the preset criteria during VFB but the SM phase was implemented regardless, the research questions were not fully addressed. For those behaviors in which the present criterion for mastery was abandoned, it is unclear whether the VFB was in fact able to raise the treatment integrity nor is clear that the SM would be able to maintain the high treatment integrity after VFB, considering the high treatment integrity was never reached. Perhaps a better setting would be one in which the

participants are not only available for a fixed time, eliminating any time constraints of the present study.

In addition to applying the intervention to behaviors that had not met the preset criterion, the time constraints also hindered the ability to collect maintenance and follow-up data, which again does not allow for an assessment regarding whether or not SM was able to maintain the high accuracy behavior after reaching the preset criterion in the VFB phase. For example, with only one to three SM data points per participant, it is difficult to make any definitive statements regarding the effectiveness of the intervention for any participant.

Another limitation worth mentioning is the less than ideal IOA scoring. There are multiple possibilities as to why low scores were achieved despite thorough operational definitions and IOA data collector training. Perhaps the target behaviors were not appropriate for this intervention, or more specifically, perhaps social skills group therapy is not an appropriate setting for such stringent interventions and behavioral definitions. When teaching social skills, it is a very different environment than, for example, the strict procedures of intensive tabletop teaching. It is taught using play and conversation, mixing the principles of ABA within. Perhaps the current operational definitions, such as a “demand” (clear, concise, stated one time, and stated as a statement rather than a question), do not encompass all of the demands that are encountered during a social skills session. For example, there was often disagreement between the IOA observers between the difference between a “demand” and “facilitating conversation,” which is outlined in the demand behavioral definition in this study’s method section. There was an instance in which the first author observed the student therapists encouraging the clients to cheer on

their peers as facilitating play, whereas the IOA observer saw that as a demand without a follow through, which in turn skewed the IOA data for that session. In this example, perhaps the operational definitions of the present study are not broad enough for this teaching environment.

On the other hand, perhaps the operational definitions were not specific enough. As the semester progressed, the behaviors of the clients progressed as well. The clients' incorrect behaviors requiring the student therapists to deliver an error correction procedure changed from maladaptive behaviors to not following through on conversational or social prompting. With Participant 3, as seen in the data of the VFB of the error correction procedure, she was very comfortable delivering the error correction for clients exhibiting physical, maladaptive behavior, but did not have the same ability to apply that same error correction required for instances in which the clients did not respond to social cues or prompting. Perhaps a more specific operational definition, and in turn a treatment integrity checklist that was broken down into additional components would have had a positive effect on the behavior of the student therapists.

Unfortunately, IOA was not collected in a linear manner, as the session videos were permanent products that could have been accessed at any time. While there are many advantages to being able to collect IOA at later times, one drawback is that the first author was not able to quickly catch and remedy any unforeseen IOA issues. For example, even after IOA training, there were discrepancies among the observers in terms of data collection style; some lumped all trials together, some spaced them out. This had a negative impact on the IOA results, and it wasn't until later in the IOA collection process that this was noticed.

Future research should look at the differential effectiveness of the frequency in which the intervention is delivered. Kelley and Miltenberger (Kelley & Miltenberger, 2016) attributed some of the effectiveness of their VFB intervention applied to horseback riding, to the immediacy and brevity of the VFB. Although immediate after each session, the present study's VFB and SM were not delivered immediately after each behavior occurred. In addition, while the VFB sessions of the current study took place immediately after each social skills group session, the groups only occurred once per week, so the behaviors were not observed until the following week. An entire week passed between the time that feedback was given, the opportunity to display those behaviors again presented itself, and another session of feedback was available. It would be important to compare the effects of VFB and SM implemented once per week like the present study, with the effects of a more frequent intervention. A future research question could be: How often is it necessary to deliver this particular type of feedback for maximum effectiveness? Research (Balcazar et al., 1985) has noted that there is no one type of feedback that is universally effective; perhaps VFB and SM once per week was effective for some of the participants of this study while other participants would benefit from a different frequency of feedback. A replication with more frequent feedback sessions would also be helpful in examining whether the intervention could be effective in changing the behavior of the student therapists in the confined 15-week period. In addition, the present study was unable to answer whether or not SM would maintain the high percentage of accuracy of participants achieved through VFB. Future research should look to replicate this study without such strict time constraints in order to assess the maintenance of the intervention.

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APPENDIX A

TARGET BEHAVIOR CHECKLIST

Date:	Observer:	Participant:	Phase/Notes:										
			1	2	3	4	5	6	7	8	9	10	%
Demand: Attention and/or eye contact of the child is gained													
SD is stated one time													
SD is stated clearly and concisely													
SD is stated as a demand and not a question													
Correct response: reinforcement delivered within 3 seconds													
Reinforcement is behavior specific													
Reinforcement has a positive intonation													
Incorrect response/non-response: informational "try again" is delivered immediately													
Informational "try again" has neutral intonation													
New trial with next prompt is immediate													
Correct prompt is used with new trial													
If additional trials needed, therapist moves up or down the prompt hierarchy in the correct order													

Directions: Each column represents 1 trial or opportunity for behavior. For each trial, start at the top and put a + or – for each behavior. If behavior is not applicable for that trial, put N/A. For the next trial, start a new column and again work your way down.

APPENDIX B

VIDEO FEEDBACK PROCEDURAL FIDELITY

Procedural Fidelity Checklist	Observer:	Date:
Behavior of Experimenter During Video Feedback Sessions		+ // - // na
1. Start video at the beginning of the social skills group		
2. Sit in observation room to observe and data collect		
3. Brings thesis binder, copies of task analysis, and pens/paper		
4. Videos are coded before feedback is delivered		
5. Bring only one participant into observation room no later than 15 minutes after vides have been coded		
6. Explain rationale and reminder of consent to end session at beginning of feedback session		
7. Give task analysis and pen to participant		
8. Have data sheet and pen to take data along with participant		
9. Stop video after first "time-stamped" opportunity for therapist behavior		
10. Instruct participant how to fill out first trial on data sheet		
11. Provide assistance and replay video as many times as requested		
12. Inspect that participant fills out data sheet. If not, repeat #7 and continue		
13. Fill out own data sheet		
14. Compare results		
15. Provide praise for correct behavior		
16. Provide praise for correctly identifying the incorrect behavior		

17. Provide corrective feedback on behaviors that were incorrect/not observed.	
18. Corrective feedback will include what the therapist did, what the therapist should have done, and how to do it. This may include modeling/role-playing but is not required	
19. Only one trial is required but may opt to do more	
20. End session without additional feedback	
21. Session lasts no longer than 30 minutes	
Procedural Fidelity Percentage:	%

APPENDIX C

SELF-MONITORING PROCEDURAL FIDELITY

Procedural Fidelity Checklist	Observer:	Date:
Behavior of Experimenter During Self-Monitoring/Maintenance Sessions		+ // - // na
1. Start video recording at beginning of social skills group.		
2. Sit in observation room to observe and data collect		
3. Brings thesis binder, copies of task analysis, and pens/paper		
4. Bring only one participant into observation room no later than 30 minutes after videos have been coded		
5. Explain rationale and reminder of consent to end session at beginning of feedback session		
6. Give data sheet and pen to participant		
7. Instruct participant how to fill out first trial on data sheet		
8. Provide assistance and replay video as many times as requested		
9. Inspect that participant fills out data sheet. If not, repeat #7 & #8		
10. Completed task analysis is handed to researcher		
11. End Session		
12. Session will last no longer than 15 minutes		
Procedural Fidelity Percentage:		%

APPENDIX D

PARTICIPANT SOCIAL VALIDITY

Social Validity- Participant:

1. I think this training system helped me to teach social skills groups better
2. I think the video feedback sessions helped me to learn about my teaching behavior
3. I liked watching the videotape of my session
4. I think the self-monitoring intervention was a good way to help me learn about my behavior
5. I liked doing the self-monitoring intervention on my behavior
6. Comparing my self-monitoring results to your self-monitoring results was helpful to learn about my behavior
7. I liked comparing my self-monitoring results to your self-monitoring results
8. Continuing the use of the self-monitoring intervention after feedback had stopped helped to maintain my behavior
9. I was okay with knowing my behavior was being watched during the session
10. I liked having my behavior watched during the session
11. I think the use of the video feedback and self-monitoring helped the kids learn better
12. At the end of the project, I felt good about my job as a therapist
13. Compared to just verbal feedback at the end of each session, this project helped me to learn more

14. Compared to just verbal feedback at the end of each session, I liked this project better

15. Compared to just verbal feedback at the end of each session, this project was easier

16. Any additional comments about the project: _____

APPENDIX E
CLINIC SOCIAL VALIDITY

Social Validity- Clinic:

1. I think that this study directly enhanced the treatment integrity of the student therapists
2. I think that this study directly contributed to the progress of our clients
3. I think that this study was worthwhile in terms of time, cost, and effort
4. I liked the study
5. I would like to use this type of performance feedback to improve therapist treatment integrity in the future
6. I would like to improve therapist treatment integrity in the future, but with a method different from video-feedback or self-monitoring
7. I think our treatment integrity was fine before this study and not much has changed as a result of the study
8. Any additional comments about the project: _____