March 2023

An Evaluation of Staff Management Strategies to Minimize Reactivity in Treatment Integrity of Intervention Implementers

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An Evaluation of Staff Management Strategies to Minimize Reactivity in Treatment Integrity of Intervention Implementers

by

Claudia C. Reyes

A thesis submitted in partial fulfillment of the requirements of the degree of Master of Science with a concentration in Applied Behavior Analysis Department of Child and Family Studies College of Behavioral and Community Sciences University of South Florida

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Date of Approval: March 20, 2023

Keywords: Feedback, Reactivity, Staff Management, Treatment Integrity

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ABSTRACT

Treatment integrity is of great importance in applied behavior analysis because of its influence on skill acquisition and behavior reduction. Staff management procedures have been assessed and found to increase levels of treatment integrity. Despite this, implementers exhibit reactivity to the presence of a supervisor with high levels of treatment integrity when supervisors are present and low levels when they are absent (e.g., Pantermuehl & Lechago, 2015). Researchers have tried to account for the effects of reactivity with limited success. The purpose of the current study was to increase treatment integrity in observer absent conditions by delivering feedback to participants following observer absent observation sessions. Two of the three participants increased their rate of positive social engagements above criterion level following BST and feedback in the observer present condition, but this increase was only seen in the observer present condition. Therefore, the combination of BST and feedback in the observer present condition effectively increased treatment integrity when supervisors were present but did not improve reactivity. The third participant responded above criterion in the observer present condition during baseline and so went straight into feedback in the observer absent condition following BST. After the delivery of feedback in the observer absent condition, the participants exhibited a level change to criterion, so feedback in the observer absent condition increased treatment integrity both with and without feedback in the observer present condition preceding it. Responding during generalization probes was variable for Sam, but remained below criterion for Clover and Alex suggesting that feedback should be delivered in all contexts in which treatment integrity is expected of implementers.
CHAPTER ONE: INTRODUCTION

From slowing down to the speed limit in the presence of a police officer to closing out of social media sites at work when the boss enters the room, a person’s behavior differs in the presence and absence of those who deliver consequences for their actions. The field of behavior analysis is no exception. In behavior analysis, treatment integrity is of great importance because of its impact on client or participant behavior, but reactivity to supervision raises the issue of increased treatment integrity only in the presence of the supervisor (Pantermuehl & Lechago, 2015). One important research question is how behavior analysts can efficiently control for reactivity to supervision when evaluating treatment integrity of intervention implementers.

Applied behavior analysis utilizes a tiered system of service delivery. Board certified behavior analysts (BCBAs®) and board certified assistant behavior analysts develop interventions that are then implemented by registered behavior technicians (RBTs®), teachers, and parents. BCBAs® need to train and manage these implementers to ensure that interventions are being carried out with fidelity. BCBAs® can utilize staff management procedures to improve and maintain skills that implementers already possess as opposed to staff training, which BCBAs® use to teach implementers new skills needed to carry out procedures (Fuesy & Miltenberger, 2014).

To improve or maintain treatment integrity, BCBAs® tend to utilize staff management procedures for the regular implementation of interventions. Treatment integrity is the extent to which implementers adhere to the procedure of an intervention as written by the supervisor (Kazdin, 2011). Research has shown that when implementers adhere to intervention procedures
with fidelity, the behaviors of their clients or participants are more likely to change in the desired
direction (DiGennaro-Reed et al., 2005, 2007; Martens et al., 1997). Existing interventions for
increasing treatment integrity will be discussed followed by a review of the existing literature
that has attempted to address reactivity of intervention implementers to supervision.

**Staff Management for Treatment Integrity**

Researchers have evaluated a plethora of strategies to increase treatment integrity. The most
straightforward of these strategies is feedback, or simply telling implementers how accurately
they are conducting the procedures and how they can improve (Reid et al., 2012). Feedback can
be provided to implementers in a number of ways: vocally (both in person and via video
conference), in writing, graphically, and video feedback (DiGennaro-Reed et al., 2010; Green et
al., 2002; Quilitch, 1975; van Vonderen et al., 2012; Zhu et al., 2020, 2021).

Not all forms of feedback are equally effective. Green et al. (2002) and Zhu et al. (2021) found
that direct verbal feedback resulted in higher levels of treatment integrity compared to feedback
delivered in writing, even when verbal feedback was delivered via videoconference. In light of
the recent global pandemic, Zhu et al. (2020) established remote, verbal feedback via
videoconference as an effective way to increase treatment integrity while emphasizing the
importance of regular continued feedback to avoid any drift in treatment integrity that could
follow the removal of the feedback. Research has also found verbal feedback to be effective at
increasing treatment integrity when combined with video modeling in one study and video self-
monitoring in another (DiGennaro-Reed et al., 2010; van Vonderen et al., 2012).

Although written feedback might not be as effective as verbal feedback, when combined with
goal setting, it resulted in more stable, increased levels of praise statements made to students by
their teacher (Martens et al., 1997). Goal setting is an effective way to incorporate the
implementers into the staff management process for increasing levels of treatment integrity by having the implementers determine their own goals for adhering to intervention procedures. Furthermore, Martens et al. (1997) found goal setting with written feedback to be highly acceptable by the study’s participants. However, when comparing goal setting to negative reinforcement procedures, the latter proved to be the more effective staff management procedure for treatment integrity (DiGennaro-Reed et al., 2005, 2007). In these two studies by DiGennaro-Reed et al. (2005, 2007), 100% treatment integrity was negatively reinforced by allowing participants to avoid a meeting with consultants where missed steps in the intervention procedure were discussed. DiGennaro-Reed et al. (2005, 2007) also concluded that daily meetings between supervisors and implementers are not necessary to maintain high levels of treatment integrity.

Looking to another form of feedback, Quilitch (1975) assessed the efficacy of publicly posted graphical feedback depicting the number of active residents in a psychiatric ward, when the goal was increasing resident participation in activities. This intervention increased the number of active residents from seven to 32 of the 95 total residents. This increase resulted from higher levels of treatment integrity (i.e., staff members leading a recreational activity each day) once the public posting of graphical feedback was implemented. Another, more recent study by Casey and McWilliam (2008) supported Quilitch’s findings by increasing teachers’ use of incidental teaching following the implementation of graphical feedback in a multiple-baseline-across-participants design.

Although effective, graphical feedback does require BCBAs® to take data and update the posted graphs in addition to their already plentiful responsibilities. Another way to improve implementers’ treatment integrity without additional work for BCBAs® is to have implementers take integrity data on themselves through self-monitoring. Petscher and Bailey (2006) evaluated
the efficacy of self-monitoring (i.e., implementers reporting the percentage of intervals they believed they engaged in the behavior) in combination with tactile prompting (i.e., vibrating pager to prompt the implementer) for the delivery of a token economy and reported an increase in treatment integrity for all participants across all behaviors. However, when the tactile prompt was removed treatment integrity decreased for some of the participants calling into question whether self-monitoring alone can maintain high levels of treatment integrity over time.

An alternative to self-monitoring during a session is video self-monitoring, where implementers collect treatment integrity data on their own behavior from video recordings. (Pelletier et al., 2010). Pelletier et al. (2010) indicated that video self-monitoring 2 hrs prior to a treatment session with a student increased treatment integrity for two out of three teachers to 100% from baseline levels and stabilized the treatment integrity for a third teacher. Another staff management procedure is the use of incentives, where implementers earn a reward for implementing procedures with high levels of fidelity. Katz et al. (1972) compared the effects of a monetary incentive to the effects of prompting. Of the two staff management procedures, monetary incentives resulted in a greater increase in treatment integrity than did prompting. Although effective, monetary incentives are not always feasible or sustainable whereas lottery staff management systems may be more cost-effective. Miller et al. (2014) provided implementers who met a treatment fidelity criterion entry into a lottery to win a monetary incentive and showed that treatment integrity for all participants improved. The impact of incentives other than money on treatment integrity has also been assessed. In one such study, Iwata et al. (1976) evaluated a lottery in which staff members who met treatment integrity criteria were entered to win the choice of their days off for the following week. When compared to an intervention where staff were assigned to implement the intervention with specific residents
in a residential facility, the lottery was found to be the more effective intervention with a more significant positive impact on implementers’ treatment integrity. The lottery was also more cost-effective than monetary incentives.

**Reactivity to Supervision in Staff Management Procedures for Treatment Integrity**

The staff management procedures discussed thus far, although effective, involve the presence of a supervisor or video camera to record implementer behavior during observation sessions. That is, the implementers were aware of the observations, which were not part of the typical day. The presence of the supervisor or camera raises the issue of reactivity to observation on the part of the implementer (Pantermuehl & Lechago, 2015). According to Kazdin (2011), reactivity is the influence an individual’s awareness of an experiment or assessment has on the behavior being assessed. It may cause the individual to behave in a way that is more desirable for the assessor but not in the way that is typical of that individual. Reactivity might limit generality of the observed effect on performance to conditions where the individual is unaware that they are being assessed or of the purpose of an experiment. The main concern is whether implementers are maintaining high levels of treatment integrity when supervisors are not looking.

According to Pantermuehl and Lechago (2015), high levels of treatment integrity are not being maintained in the absence of supervision. They compared levels of treatment integrity in three different conditions: (a) covert observations without feedback, (b) observer present observations with feedback, and (c) Skype observations with feedback. Results indicated that both observer-present and Skype observations plus feedback had similar, positive effects on levels of treatment integrity, while improvements in treatment integrity were not demonstrated to the same degree in the covert observation condition. This indicates that a treatment integrity issue does exist with an implementer’s reactivity to supervision.
Researchers have attempted to control for the influence of reactivity to supervision by modifying some of the staff management procedures discussed previously. Brackett et al. (2007) evaluated the impact of self-monitoring in both conspicuous and inconspicuous observation conditions. Although treatment integrity was low during inconspicuous observation prior to self-monitoring and high during conspicuous observation, treatment integrity during inconspicuous observation did improve after the addition of the self-monitoring component. These results contradicted those of the Petscher and Bailey (2006) study where treatment integrity levels started decreasing when self-monitoring was utilized on its own without tactile prompting.

The efficacy of self-monitoring in the absence of supervision was further called into question in a study by Fuesy and Miltenberger (2014). The conditions incorporated into this study were (a) conspicuous observation and performance feedback, (b) inconspicuous observation and no feedback, and (c) addition of self-monitoring to the other two conditions. In this study, treatment integrity only increased in conditions with conspicuous observation regardless of whether self-monitoring was incorporated into the staff management procedure. Unfortunately, self-monitoring does not seem to be an effective staff management procedure to maintain high levels of treatment integrity in the absence of a supervisor (Fuesy & Miltenberger, 2014; Petscher & Bailey, 2006).

Although self-monitoring may not be effective in controlling reactivity, researchers have explored other staff management procedures and their effect on reactivity. To name one such approach, Mowery et al. (2010) utilized a tactile prompt in both supervisor present and supervisor absent conditions. For all participants, treatment integrity did not increase in the supervisor absent conditions regardless of whether tactile prompting was applied. Therefore,
tactile prompting was not an efficacious staff management intervention to increase levels of treatment integrity in the absence of the supervisor.

In searching for an effective staff management procedure that minimizes reactivity, King et al. (2018) sought to take advantage of the observer effect. The observer effect refers to the phenomenon in which observation and evaluation of other people’s behaviors has a positive impact on their own behaviors in the same situation. The researchers had participants score videos of the target behavior displayed by other people in conditions where participants were and were not aware that their own behaviors were being observed and scored. The influence of the observer effect on the behaviors of an individual was greater when the individual was cognizant that they were being watched, so taking advantage of the observer effect had limited success.

Codding et al. (2008), provided participants with feedback in both observer present and absent conditions which resulted in an increase in treatment integrity in both conditions. Although these results seem promising, the fact that the participants were not blind to the purpose of this study could have been responsible for the low levels of differentiation of treatment integrity during baseline and potentially during the staff management intervention. Because there was no evidence of reactivity in baseline, it is unclear whether the provision of feedback in observer present and observer absent conditions can actually control for reactivity. It is possible that the provision of feedback in both observer present and observer absent conditions is just a good way to improve levels of treatment integrity when reactivity is not an issue and when implementers are behaving at below criteria levels in both observer present and absent conditions in baseline.

Minard and Miltenberger (2014) investigated the issue of reactivity and evaluated an intervention to control it. They evaluated self-monitoring and feedback and showed that preschool teachers engaged in more positive interactions following the intervention. However, participants
displayed lower levels of positive interactions in supervisor absent conditions. Across all observation conditions, the participants were also told to use a self-monitoring system. Following a reactivity control condition where they received feedback following observer absent observation sessions with self-monitoring, all participants were responding above the goal level. However, due to the fact that self-monitoring was utilized across all sessions except for baseline, one cannot be certain whether the feedback following observer absent conditions would have effectively controlled for reactivity without utilizing self-monitoring. This would be a point of concern if, as aforementioned, self-monitoring might be too cumbersome a component to incorporate into a staff management procedure in practical application or if the issue of false reporting occurs in self-monitoring. Moreover, the participants were informed that the supervisor would be monitoring them via live video camera feed, and the camera was placed in the room by a research assistant prior to each observation session. This could have resulted in reactivity to the presence of the video camera, similar to the reactivity exhibited in the presence of the supervisor.

Possible Approaches to Efficiently Increasing Treatment Integrity with Reduced Reactivity

This limitation brings up a valid point touched on by Brackett et al. in their 2007 study. The point is this: reactivity in treatment integrity is simply a byproduct of the stimulus control that supervisors have over the implementors’ high levels of treatment integrity. This means that implementing an intervention with high fidelity is more probable in the presence of the supervisor because high levels of treatment integrity is only reinforced when the supervisor is present (Miltenberger, 2014). With this mindset, would not the task at hand be then to transfer stimulus control from the supervisor to the client, student, or participant? The principles utilized in transfer of stimulus control involves prompt fading, stimulus fading, and prompt delay (Miltenberger, 2014). This has been attempted with tactile prompting and evidence has shown
that tactile prompting either cannot increase treatment integrity in the absence of supervisors (Mowery et al., 2010) or might not be robust when the prompt is gradually removed (Petscher & Bailey, 2006). Another potential avenue might be to implement some kind of remote verbal prompting procedure in both observer present and observer absent conditions. However, this might raise issues of reactivity to the intervention in the observer absent condition. Once the first verbal prompt is delivered in the observer absent condition, the implementer will be aware that they are being observed and change their behaviors accordingly. The other types of prompting (verbal, gestural, modeling, and physical) as identified by Miltenberger (2014) would require the presence of the supervisor. This would, in turn, raise issues with reactivity to the supervisor’s presence.

Another way to approach this issue is to consider implementors’ treatment integrity behavior as rule-governed. That is, one considers behaving with high levels of treatment integrity as controlled by a verbal statement about the contingency between implementation with and without fidelity and the consequences (Miltenberger, 2014). The rules prior to staff management might be something like: “When I know my supervisor is watching, I am corrected for conducting the intervention procedure incorrectly. When I know my supervisor is not watching, I am not corrected for conducting the intervention procedure incorrectly.” In this case, one might only have to change the rule to something like: “Regardless of whether I think my supervisor is watching or not, I might be corrected for conducting the intervention procedure incorrectly.”

How might one go about this? The author suggests observer absent observation sessions followed by verbal feedback. In this case, implementor will not be able to differentiate when they are being observed (most probably via video camera or observation mirror). If the implementor is not able to discriminate between typical sessions and observation sessions, then it
is hypothesized that there will be an overall increase in treatment integrity since the implementor cannot tell when someone might be watching.

There is an issue with this proposed solution to treatment integrity reactivity. As mentioned in the book by Reid et al. (2012), covert observation in this manner can result in a loss of respect and acceptance for the supervisor. To this the author offers up a counterpoint. Part of the goals of BCBAs in the field is to create an efficient, effective culture of supervision. That might be done over camera or through one way mirror, but at the end of the day, practitioners want to behave in a way that will positively impact clients, students, and participants the most. With this in mind, as long as implementors are aware that they could potentially be observed at any moment via video camera and provided with feedback, then this type of staff management procedure might not seem so far-fetched, especially in settings that already utilize a camera system at all times for safety reasons where all employees and clients have been made aware and have given their consent to be recorded. Additionally, this staff management procedure is less time consuming compared to the heavy observation and feedback schedules previous studies required and less costly than other staff management procedures like monetary incentives.

Considering the importance of reactivity and the need for strategies to increase treatment integrity in the absence of a supervisor or researcher, the purpose of the current study was to evaluate an intervention to increase treatment integrity in observer absent conditions when participants were blind to the purpose of the study and displayed reactivity to a supervisor’s presence. To that end, the current study addressed the limitations of Codding et al. (2008) and Minard and Miltenberger (2014) by ensuring that the participants were blind to the purpose of the study while being observed in both observer present and observer absent observation conditions. If a participant exhibited high levels of treatment integrity in observer present
observation sessions and low levels of treatment integrity in observer absent observation sessions, they were subjected to feedback following observer absent observation sessions. Generalization probes were conducted to see if increased levels of treatment integrity generalized to times outside the study’s observation window or if feedback following observer absent observation sessions must be delivered for all settings and clients for which an intervention must be conducted.
CHAPTER TWO: METHOD

Participants and Setting

Three registered behavior technicians (RBTs®) were recruited from two behavior analysis clinics for children diagnosed with autism spectrum disorder in Florida via a flyer that was posted in the RBT® common area and an email that was sent out to all RBTs® in the clinics. The RBTs® were registered and working for the clinic for a minimum of 3 months at the time of recruitment. Sam was a 27-year-old woman who had been an RBT® since July of 2022. She had her Bachelor of Arts degree in psychology, and she had no prior experience in ABA before becoming an RBT®. She had not worked with children with ASD before working at this ABA company, and she did have previous experience in childcare as a day care volunteer. Clover was a 38-year-old woman and had been an RBT® for 1 year. She had her A.A. degree and had worked in childcare as a preschool teacher prior to becoming an RBT®. The last participant, Alex, was a 32-year-old woman who had been credentialed as an RBT® for 11 months. She had her Bachelor’s degree in psychology, and no prior experience in ABA or childcare prior to working as an RBT®.

All training and assessments took place in the behavior analysis clinics. The clinics had several therapy rooms, a kitchen, a classroom, a padded room, a conference room, bathrooms, a playroom, a sensory gym, and offices for staff. Prior to any training or assessments, the participants attended a meeting with the researcher to answer any questions that they had. However, there were questions that the researcher was not be able to provide specific answers to due to the nature of the study. Before beginning the study, the participants signed a consent form.
Materials

For this study, a system of observation cameras that run throughout the behavior analysis clinics were utilized. The cameras were set up to monitor client safety in the clinics for over 2 years, and they were able to take audio and video recordings. Each camera was positioned in the corner of the different therapy rooms, hallways, and play areas to capture the entire room except for the area directly below the camera. The recordings remained in the clinic’s security system for 2 weeks before being automatically deleted from the system.

Target Behaviors and Measurement

The target behavior for this study was positive social engagement between participants and their clients, defined as: when the participant was not actively engaging with their cell phone and was within 6 feet of the client, any positive comment made by the participant to the client (e.g., “I like your shirt!” or “You’re doing well over there!”), behavior specific praise (e.g., “I like how safe you’re being while you play with that toy!”), play statements (e.g., “Woah! The car went really fast!”), positive physical interactions (e.g., fist bumps and pats on the back), modeling play (e.g. the RBT® pushed a car down a ramp or built a structure out of magnet tiles for the client), or cooperative play where the client and RBT® each took at least one turn in a game (e.g., playing with a marble track together or playing chase). Instances of vocal positive social engagement (e.g. positive comments, behavior specific praise, or play statements) were separated by the absence of vocal positive social engagement for at least 3 s, and instances of positive physical interactions were separated by broken contact between the RBT and client. Engagement with their cell phone was when the participant had their phone turned on, was visually scanning the screen for 3 s or longer, and may or may not have included actively tapping or swiping the screen.
Positive social engagement was measured using a frequency within interval recording system during observation sessions consisting of 1-min intervals during reinforcer breaks. For a reinforcer break to qualify as an observation session, it had to be a minimum of 3-min long. Rate of responding for each observation session was calculated to account for the differing lengths of observation sessions. A frequency count occurred in every 1-min interval. The rate of positive social engagements was calculated by dividing the total number of occurrences by the duration of the observation period in minutes. The observation sessions occurred three to sixteen times a week during regularly scheduled times and days of the week when the client and participant were on a reinforcement break. If the break was shorter than 3 min, this did not meet the requirement of an observation session, and the data was disregarded. Data were taken on the next reinforcement break that lasted a minimum of 3 min. Data were collected in both observer present and observer absent observation sessions. Observer present observation sessions were when the researcher was present in the room with the participant and their client. Observer absent observation sessions were when the researcher was monitoring the participant and their client during a reinforcement break via the observation camera system. The data collection sheet can be found in Appendix A.

**Interobserver Agreement**

Four research assistants (RAs) were trained to collect IOA and treatment integrity data. The researcher provided the RAs with verbal and written instructions about the target behavior, explained the purpose of the study, and allowed the RAs to practice data collection on a video example of pairing. The researcher stopped the video after each minute, calculated IOA, and provided feedback for any discrepancies. IOA needed to reach a minimum of 80% for the RA for training to be complete. If an RA’s average IOA fell below 70%, then the RA was retrained on
data collection using a prior session with a participant instead of the training video. A second observer was present during 40% of observation sessions to collect data simultaneously but independently of the primary observer. Frequency within interval interobserver agreement (IOA) was calculated to compare data collection across the two observers. Frequency within interval IOA was calculated by dividing the smaller number of occurrences within an interval recorded by one observer by the larger number of occurrences within an interval recorded by the other observer. This quotient was then converted into a percentage by multiplying by 100. Intervals in which both observers score 0 were considered 100% agreement for that interval. A percentage was calculated for each interval. The percentages of each interval within an observation session were summed and divided by the total number of intervals. This quotient was multiplied by 100 to result in a percentage. This percentage was the IOA for that observation session. Agreement was 86.25% (range 34% to 100%) in 40% of sessions for Sam, 93% (range 62% to 100%) in 40% of sessions for Clover, and 90.3% (range 71.46% to 100%) in 40% of sessions for Alex.

Social Validity

A questionnaire was provided to the participants following the feedback fading phase (see Appendix B). The questionnaire consisted of seven questions using a 5-point Likert scale (e.g., 1 = strongly disagree to 5 = strongly agree). The questionnaire assessed the participants’ opinions of the intervention. Some questions included in the questionnaire were, “The feedback I received from the researcher improved the quality of my interactions with my client,” “The feedback I received when I was observed over the cameras improved the quantity of my interactions with my client,” and “I was comfortable receiving feedback after observation sessions where the researcher was not in the room with me.”
**Treatment Integrity**

To assess the treatment integrity of the researcher’s implementation of the procedures, a checklist of the behaviors for data collection and providing feedback in each phase was utilized (see Appendix C). Treatment integrity data was collected for 39% of observation sessions by the second observer. Treatment integrity was calculated by dividing the number of steps implemented correctly by the number of steps on the checklist. Treatment integrity was 100% in 40% of sessions for Sam, 100% in 37% of sessions for Clover, and 100% in 41% of sessions for Alex.

**Experimental Design**

A nonconcurrent multiple baseline design across participants was utilized in combination with an ABC design and an embedded alternating treatments design. Data were collected in both observer present (where the researcher was present in the room with the implementer) and observer absent (where the researcher was observing via video camera in a different room, out of sight of the implementer) conditions in the A and B phases and in the observer absent condition only in the C phase. The “A” phase was baseline. The “B” phase was conducted following behavioral skills training (BST) on how to provide positive social engagements four or more times per minute. Phase “B” incorporated feedback in the observer present condition, and no feedback was provided in the observer absent condition. The “C” phase was the provision of feedback in the observer absent condition only.

**Baseline**

During baseline, the researcher collected data on the number of positive social engagements exhibited by the participants. For this condition, the researcher did not provide BST or feedback for positive social engagements. The participants were only aware that, during reinforcement
breaks, the ABA company expected them to pair with their clients. They had received prior feedback from supervisors on how to pair with individual clients, but not the specific definition of positive social engagements as defined by the researcher. Baseline observation sessions were conducted in alternating observer present and observer absent conditions. Baseline probes also occurred in generalization sessions consisting of observer absent observations at a different time of day.

*Feedback in Observer Present Condition*

**BST.** The researcher met with the participants and provided BST for positive social engagements through written (see Appendix D) and verbal instructions, live modeling, rehearsal, and feedback. During feedback, the researcher provided praise when participants utilized the different topographies of positive social engagement. The researcher provided prompts for how to engage in topographies of positive social engagement not displayed during rehearsal or to remind participants to implement positive social engagement at least four times every minute. Participants were consistently performing at two responses per minute, which was consistent with the study by Minard and Miltenberger (2014), and so a goal of four responses per minute was established because it was a goal that was attainable for the participants. However, it was not consistently met by all participants in baseline. In order for the participants to meet mastery and for training to be terminated, the participant needed to engage in at least four positive social engagements for at least four 1-min intervals in a 5-min time span during rehearsals. The researcher created simulated scenarios for the participants to rehearse a minimum of three of the different topographies of the behavior as described in the definition. This was done by verbally prompting the participant to display a different topography of positive social engagement prior to the beginning of a simulated scenario.
**Feedback.** Following the training session, observations were conducted in both observer present and observer absent conditions with the provision of feedback only in the observer present condition. Feedback was delivered immediately following observer present sessions where the researcher: (a) provided praise for the delivery of positive social engagement, (b) told participants whether or not they reached the target level of performance of four positive social engagement per minute, (c) provided praise if the participant’s level of responding was consistent throughout the observation session, or (d) told the participant if the provision of positive social engagement was inconsistent throughout the observation session (e.g., a majority of their positive social engagement was concentrated at the beginning, middle, or end of the session with a large number of intervals passing without positive social engagement). In the case of inconsistent positive social engagement, the researcher encouraged participants to provide social positive engagement throughout all minutes, even if some minutes have a higher frequency of positive social engagement than others. The researcher continued to collect data during observer absent conditions.

**Feedback in Observer Absent Condition**

If the participants displayed rates of correct responding that met criterion in observer present conditions and low rates of correct responding in observer absent conditions, they proceeded to the feedback in the observer absent condition. During observer absent sessions, the researcher observed the RBT® and client via video camera in real time. The RBT® was not certain whether they were being observed during that time. However, they were aware that being observed during that time was a possibility as that time and day of the week was agreed upon at the beginning of the study as being allotted for this study. At the end of each observation session, the researcher provided feedback in the manner described in the previous section. Feedback sessions
occurred from one to eight times per week depending on the researcher’s schedule and the opportunity for an observation when the researcher was on site. On some occasions when the researcher was on site observing remotely in the room with monitors, there was no opportunity for an observation because the participant did not take a reinforcement break with their client at that time. Therefore, the sessions in which the participant received feedback were unpredictable to the participant.

*Generalization Probes*

The researcher conducted generalization probes across all phases with at least two generalization probes being conducted in each phase. The probes occurred during observer absent conditions within the clients’ reinforcement breaks. These probes were conducted outside of the participants’ regularly scheduled observation sessions to see if any increases in the levels of positive social engagement generalized outside of the times that the participants knew were allotted to the study. Frequency within interval data using 1-min intervals was collected, and the rate of positive social engagement was calculated for each observation session. The researcher did not deliver feedback to the participants during generalization probes.
CHAPTER THREE: RESULTS

Results for this study are depicted in Figure 1. The graph displays participants’ responses in baseline, after BST with feedback in observer present conditions, after receiving feedback in observer absent conditions, and during generalization probes.

Sam

During baseline, Sam responded below the criterion level in all observer absent observation sessions (mean = 1.69 responses per minute) and generalization probe sessions (mean = 3.41 responses per minute), and she responded above criterion in four out of ten observer present observation sessions (mean = 4.30 responses per minute). She began to display reactivity to the researcher’s presence at session eight, as seen by the separation in the data paths for the observer present and observer absent conditions. Toward the end of baseline, her data in both the observer present and observer absent conditions began to trend downward, so she progressed to BST with feedback in the observer present condition.

During BST, Sam responded above criterion levels for all three scenarios during BST at 7.8, 6.4, and 11.2 responses per minute respectively. Her initial data points in the observer present condition following BST were above 10 responses per minute, and then fluctuated between 8 and 4.5 responses per minute (mean = 6.79 responses per minute). She fell below criterion one time in the observer present condition. Responding in the observer absent condition was below criterion level for every observer absent observation session in this condition, with no overlap between the observer present and observer absent data paths serving as evidence for reactivity in
this phase as well (mean = 2.01 responses per minute). Three of the four generalization probes in
this phase fell below criterion (mean = 3.38 responses per minute).

During feedback in the observer absent condition, Sam’s first data point in this phase (labeled
pre-feedback in Figure 1) before being exposed to feedback following an observer absent
observation session fell below criterion level. In subsequent sessions in this phase, Sam’s level of
engagement increased to a mean of 4.43 responses per minute with eleven of fifteen data points
at or above the criterion. In this phase generalization data were above criterion in two of the three
generalization probes (mean = 4.92 responses per minute).

**Clover**

For Clover’s baseline, her initial levels of responding in the observer present condition were well
above criterion as the study began. This level dropped as her participation in the study
progressed with nine of her data points in the observer present condition below criterion level
(mean = 3.56 responses per minute). Responding in the observer absent condition also started
higher and then dropped off, with her first data point in this condition meeting criterion, and then
nine of the thirteen data points in this condition falling below one response per minute (mean =
0.85 responses per minute). Clover also exhibited reactivity in baseline as seen by the separation
in the data paths for observer present and observer absent conditions, where responding in the
observer present condition was above responding in the observer absent condition for the most
part. All generalization probes in this phase fell below the criterion level (mean = 1.86 responses
per minute).

Clover’s responding in BST was above criterion level at 8, 7.8, and 16.4 responses per minute
across the three scenarios. Following this training, responding in the observer present condition
was above criterion in nine of the ten data points collected in this condition (mean = 5.52
responses per minute). This was contrasted by her responding in the observer absent condition, where nine of the ten data points were below the criterion level (mean = 1.62 responses per minute). While there was some overlap in this phase, the data paths remained separated during a majority of this phase, providing evidence that Clover was exhibiting reactivity to the researcher’s presence in this phase following BST and with the provision of feedback following observer present observation sessions. The generalization probes in this condition seemed to trend downward (mean = 2.4 responses per minute).

Clover’s initial data point in the feedback in the observer absent condition was below criterion. At this pre-feedback data point, Clover had not yet been exposed to feedback following an observer absent observation session, but the impact of this feedback delivery in the third phase of the study can be seen in the change in level in Clover’s responding in the observer absent condition (mean = 4.33 responses per minute) throughout the rest of the phase. In this third phase, Clover’s responding during generalization probes remained below criterion (mean = 1.5 responses per minute).

Alex

Alex’s responding in baseline was quite unlike the other two participants. While she exhibited a downward trend below criterion in the first seven data points in the observer present condition during baseline, this was followed by a trend upward that leveled off above criterion and remained there for the rest of the phase (mean = 5.56). Responding in the observer absent condition was similar to that of the other participants in that sixteen of the eighteen data points in the observer absent condition in baseline fell below criterion (mean = 2.56). There was minimal overlap between the two data paths, the separation between the data paths acting as evidence for
reactivity once again. Similar to responding in the observer absent condition, all generalization probes in this phase fell below criterion (mean = 1.79).

Since Alex’s responding in the observer present condition was above criterion in baseline, following BST she progressed straight into the feedback in the observer absent phase. During BST, she responded above criterion in all rehearsal scenarios at 6.6, 8.4, and 12.8 responses per minute respectively. Once in the feedback in the observer absent condition, her first data point pre-feedback was well above criterion before falling below in the subsequent two sessions and then changing level to meet criterion in the final three data points in this phase. Out of the 6 data points in this phase, 4 were above criterion with a mean of 4.65 responses per minute. Both generalization probes in this phase fell below criterion (mean = 1.76 responses per minute).
Figure 1. Rate of Participants’ Positive Social Engagement (Responses per Minute)
CHAPTER FOUR: DISCUSSION

Results of this study suggest that, even prior to any training to engage in a specific behavior, intervention implementers may exhibit reactivity to the presence of a supervisor. The increased level of positive interaction in observer present conditions compared to observer absent conditions in baseline suggest that staff understood they should be engaging in positive interactions even before any intervention was implemented, but they were more likely to do so when someone was watching. These results were unlike those in Fuesy and Miltenberger (2014) and Codding et al. (2008) where participants exhibited little to no reactivity to the presence of the researchers during baseline. This may have been due to an overall effort on the part of the participants to engage in more work-related behaviors in the presence of the researcher. This is similar to initial participant responding in the study conducted by Brackett et al. (2008) during conspicuous and inconspicuous observation sessions. Future research should examine if participants exhibit increases in work-related behaviors in the presence of supervision.

Additionally, both Sam and Clover exhibited reactivity to starting the study as evident by their respective responding well above 10 responses per minute and the subsequent downward trend. These baseline data show initial reactivity to observation, with a decrease in reactivity with continued exposure to the researcher and support the practice of extended baselines in research to control for the effect that being observed in a study has on the behaviors of a participant. Following BST, an immediate level change was evident for both Sam and Clover in the observer present condition above criterion while responding in the observer absent condition remained
below criterion. This is comparable to the results of Fuesy and Miltenberger (2014) in that participants in both studies exhibited a separation in the data paths between observer present and observer absent conditions following BST. Clover did also exhibit a slight increase in level in the observer absent condition following BST, though not to criterion. Again, these data are a convincing demonstration of reactivity to observation and suggest that research in staff management should include surreptitious observation to assess the true effects of an intervention. This increase in the observer present condition may be due to the role of the researcher as a discriminative stimulus for the RBT. Only in the presence of the researcher, did meeting the goal of four responses per minute result in behavior specific praise from the researcher. In this way, the researcher’s presence potentially acted as an $S^D$ for higher rates of positive social engagement. Similarly, only in the presence of the researcher did failing to meet the goal by engaging in incompatible behaviors or by not responding at a high enough rate did the participants receive corrective feedback.

However, in the observer absent condition, no such $S^D$'s are present. In this condition, not only are engaging in higher rates of positive social engagements more effortful, but they could also be on a thinner schedule of reinforcement from the natural environment compared to other, incompatible behaviors (e.g., using one’s phone, talking with coworkers, etc.). In this way, the provision of feedback in the observer absent condition aided the transfer of stimulus control from the researcher to the client and the context of service delivery. The participants could no longer use the researcher’s presence as a way to predict the delivery of feedback, so participants began to meet criterion more regularly in the observer absent condition following the first delivery of feedback following an observer absent observation session.
Sam’s responding to the generalization probes was variable, with some data points above and some below criterion in baseline and both intervention phases. Therefore, the interventions appeared to have no effect on these data. Clover and Alex’s responding in generalization probes showed a different pattern; all of their generalization probes fell below the criterion line except for one. It is not clear why the participants had different patterns in their generalization data, but, because the data were not influenced by the interventions, the data suggest they were aware that they would not encounter the researcher outside of the time blocks allocated for the study. In practice, this means that supervisors should provide feedback following observer absent conditions across all times that a particular work behavior is expected to avoid any reactivity to observation time windows.

Because Alex was already performing well above criterion in the OP condition in baseline, we did not implement intervention in the OP condition moved into BST and feedback in the OA condition instead. The behavior in the OA condition increased with feedback. Because the intervention in the OA condition did not follow intervention in the OP condition, it showed that the effects of feedback in the OA condition were not dependent on prior exposure to the feedback in the OP condition.

Due to unforeseen circumstances, the researcher had to utilize two different clinics as opposed to a single clinic, which prevented the researcher from providing feedback as often as was originally planned. Future research should attempt to provide a more consistent schedule of feedback following observer absent observations and attempt to fade feedback systematically to see if the increases in positive social engagements maintains at less dense schedules of feedback. Another limitation was the lower than expected level of IOA. Although IOA was above 80%, it was still lower than the researcher had hoped. This could have been due to the use of frequency
within interval, a stringent method of calculating IOA that the author utilized for this study. It is also the case that recording the frequency of positive interactions proved challenging at times as it was not always clear when one instance of the behavior stopped and another instance started. Regardless, future research should consider all topographies of positive interaction and the timing of such interactions when training data collectors so that higher IOA can be achieved. The researchers believe the results of this study have important implications for research in staff management because it emphasizes the importance of accounting for reactivity in future staff management research, especially in treatment integrity of intervention implementers. While different training methods and staff management procedures might result in improved levels of treatment integrity in the presence of a researcher or supervisor, these improvements will be for naught if they are not maintained when implementers are alone, which is the case of a majority of behavior analytic service provision in early intervention. Additionally, future research can look to feedback in the observer absent condition as a way to prevent reactivity in newly trained treatment integrity skills and the acceptability of this feedback by intervention implementers. This is especially important because the sooner an intervention is implemented with high treatment integrity, the sooner supervisors can be confident in the program’s effect on client behavior and make clinical decisions to continue with a program or change gears. Lastly, future research can explore the percentage of sessions or service delivery hours that result in feedback in the observer absent condition in order to maintain increased levels of treatment integrity. Supervisors often have multiple clients under their care, all of which require supervision. If feedback in the observer absent condition requires a high percentage of observation and feedback in order to maintain its positive effects, then this might not be feasible in practice. Should this be the case, other controls for reactivity might also need to be explored.
REFERENCES


Appendix A: Positive Social Engagement Data Collection Sheet

<table>
<thead>
<tr>
<th>Date:</th>
<th>Time:</th>
<th>Room:</th>
</tr>
</thead>
</table>

Participant: _______________ Session Number: ______

Select Condition: Observer Present Observer Absent Generalization Probe

Select One: Primary Data Collector IOA

Select Phase: Baseline Observer Present Observer Absent

Name of IOA Data Collector: __________

<table>
<thead>
<tr>
<th>Minute</th>
<th>Tally</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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<td>3</td>
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<td>15</td>
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</tbody>
</table>

\[
\text{Total responses per min} = \frac{\text{Σ of number of positive social engagements}}{\text{total number of minutes}} = \text{responses per min}
\]
Appendix B: Social Validity Survey

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
<tbody>
<tr>
<td>1. The training I received on positive social engagement</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>improved the quality of my interactions with my client.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The feedback I received from the researcher during sessions</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>with my client improved the <em>quality</em> of my interactions with</td>
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<tr>
<td>my client.</td>
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<tr>
<td>3. The feedback I received from the researcher during sessions</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>with my client improved the <em>quantity</em> of my interactions with</td>
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<tr>
<td>my client.</td>
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<tr>
<td>4. The feedback I received when I was observed over the cameras</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>improved the <em>quality</em> of my interactions with my client.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The feedback I received when I was observed over the cameras</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>improved the <em>quantity</em> of my interactions with my client.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I was comfortable receiving feedback after observation</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>sessions where the researcher was in the room with me.</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>7. I was comfortable receiving feedback after observation</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>sessions where the researcher was not in the room with me.</td>
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</tr>
</tbody>
</table>

Across all participants, the number of positive social engagements was relatively low when the researcher was not in the room with the participants and their clients. Based on your own experience participating in this study, why do you think the number of positive engagements decreased when the researcher was not present?
Appendix C: Researcher Treatment Integrity Checklist

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Was the step implemented?</td>
</tr>
<tr>
<td>1.</td>
<td>In the observer present condition, the researcher enters the room with the participant and their client and greets the participant and client (e.g. “Hey guys! I’m going to hang out with you for a while!”) and sits in a spot in the room where the client and participant are clearly visible. In the observer absent condition, the researcher pulls the video feed up of the room where the researcher and client are located, ensuring that the image is zoomed in so that the client and participant are clearly visible and that the volume is turned up high enough that the client and participant are audible. The researcher does not tell the participant that they are being observed immediately prior to the observation session.</td>
</tr>
<tr>
<td>2.</td>
<td>The researcher started a recurring 1 min timer at the beginning of the client’s reinforcement break</td>
</tr>
<tr>
<td>3.</td>
<td>The researcher put a tally in the box for the appropriate interval each time the participant delivered a positive social engagement to the client</td>
</tr>
<tr>
<td>3.</td>
<td>If the reinforcement break was less than 5 min, the researcher repeated steps 1 and 2 until data was collected for a reinforcement break that lasted 5 min or longer.</td>
</tr>
<tr>
<td>4.</td>
<td>The researcher calculated the average number of responses per minute for that observation session.</td>
</tr>
<tr>
<td>5.</td>
<td>The researcher told the participant if they met the target level of responding (2 positive social engagements per minute).</td>
</tr>
<tr>
<td>6.</td>
<td>The researcher either praised the participant if the responses were delivered distributed throughout the entire observation session or provided corrective feedback if the responses were concentrated during a certain portion of the observation interval.</td>
</tr>
<tr>
<td>7.</td>
<td>The researcher provided praise for the forms of positive social engagement provided to the client by the participant and provided recommendations for how to provide other forms of positive social engagement if only one form of positive social engagement was provided during the observation session.</td>
</tr>
</tbody>
</table>
Appendix D: BST Handout

Positive Social Engagement

Why is it important?
Positive social engagement can be utilized in the context of pairing with your clients, and pairing can help improve your instructional control with clients and build a better rapport with them overall.

What is it?
In the absence of phone use and when you are within 6ft of the client, any instance of one of the following:

- **Positive Comment**: complimentary comment made by the participant to the client which may or may not address the client’s belongings, appearance, or current activity
  - e.g., “I like your shirt!” or “You’re doing well over there!”
- **Behavior Specific Praise**: complimentary comment specifying what the client is saying or doing
  - e.g., “I like how safe you’re being while you play with that toy!”
- **Play Statements**: mands, tacts, or intraverbal statement regarding the leisure activity the client and/or participant is engaged in, includes onomatopoeias and excludes demands of any kind
  - e.g., “Woah! The car went really fast!”
- **Positive Physical Interactions**: When the participant makes physical contact with the client during a play activity excluding response blocking or physical prompting
  - e.g., fist bumps and pats on the back
- **Cooperative Play**: where the client and RBT® each take at least one turn in a game or with a toy (e.g., playing with a marble track together or playing chase) or the RBT models engaging in an activity for the client (e.g., swings on the swing or jumps on a trampoline)
  - Each turn the participant makes is one occurrence of cooperative play

The Goal?
- 4 positive social engagements per minute with your client on average during reinforcement breaks
- Consistent delivery throughout break, not concentrated all at the beginning, middle, or end of the reinforcement break.
November 21, 2022

Claudia Reyes

Dear Ms. Claudia Reyes:

On 11/21/2022, the IRB reviewed and approved the following protocol:

<table>
<thead>
<tr>
<th>Application Type:</th>
<th>Modification / Update</th>
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<tbody>
<tr>
<td>IRB ID:</td>
<td>STUDY004793  MOD000002</td>
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<tr>
<td>Review Type:</td>
<td>Expedited</td>
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<tr>
<td>Title:</td>
<td>An Evaluation of Staff Management Strategies to Minimize Reactivity in Treatment Integrity of Intervention Implementers</td>
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<td>Funding:</td>
<td>None</td>
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<td>IND, IDE, or HDE:</td>
<td>None</td>
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<td>Approved Protocol and Consent(s)/Assent(s):</td>
<td>Reyes - Reactivity Study Adult Consent Form; Approved study documents can be found under the ‘Documents’ tab in the main study workspace. Use the stamped consent found under the ‘Last Finalized’ column under the ‘Documents’ tab.</td>
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</tbody>
</table>

The modifications, as described by the study team below, have been approved:

Addition of 2 research assistants (Ellie Warmund and Nina Byrne) to the study and addition of a second location for the study (Invo's Wesley Chapel location: 26844 Tanic Drive, Wesley Chapel). I have updated the consent form and flyer to include this location.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Reconsent is not required.

Sincerely,