AN EVALUATION OF FEEDBACK FREQUENCIES DURING MAINTENANCE

by

MAGGIE A. MOLONY

(Under the Direction of Joel E. Ringdahl)

ABSTRACT

Researchers have demonstrated that several approaches, including feedback, self-generated feedback, and reinforcement-based programs, are effective approaches to change residential and day program direct-care staff (DCS) behavior. However, there is minimal information pertaining to the maintenance of these approaches. In the current study, the researcher evaluated the maintenance of an in-service training combined with a performance feedback (vocal and written) intervention related to increasing appropriate staff-client interactions. Researchers trained DCS in two targeted activities; lunchtime and PM small group time. The researcher then reduced the frequency of feedback to either following every third or sixth observation. An alternating treatments design was used to evaluate the effects of each feedback frequency of the maintenance of staffs' appropriate interactions with clients across time periods. Results from this experiment did demonstrate that session performance feedback improved behavior. However, those improvements began to diminish with the thinning of feedback and there was no systematic difference in performance across feedback frequencies.

INDEX WORDS: direct-care staff, training, feedback, maintenance

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MAGGIE A. MOLONY

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M.S., Southern Illinois University, 2013

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MAGGIE A. MOLONY

Major Professor:	Joel E. Ringdahl
Committee:	Scott P. Ardoin
	Kevin M. Ayres
	Sandie Bass-Ringdahl

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
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DEDICATION

I dedicate this to my Robs and my Boss. You both are mine forever and always.

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CHAPTER 1

INTRODUCTION

In the 1960s and 1970s, laws and changing social attitudes facilitated the movement of individuals with intellectual and/or developmental disabilities (IDD) from living in institutions and hospitals to living in more community-based residential environments (Hallahan, Kauffman, & Pullen, 2015). The Americans with Disabilities Act (ADA; 1990) and the *Olmstead v. L.C. by Zimring* (1999) case provided the legal foundation necessary for nondiscriminatory treatment of individuals with IDD and residential placement that initiated inclusion of individuals with IDD into society. Along with changed laws that benefited individuals with IDD, there have been interest in improving the behavior of direct-care staff (DCS) that work in these environments (e.g., residential placements, community homes, and day programs).

DCS behavior became a research focus due to its importance in the lives of individuals these staff members support. Professional development and staff training programs led to improved quality of life for individuals with IDD (van Oorsouw, Embregts, Bosman, and Jahoda, 2009). These staff members form the first line of care and should interact with the clients frequently throughout the day. During their time together, DCS directly work with clients as they complete activities of daily living (ADLs; e.g., bathing, eating), engage in vocational tasks (e.g., contract work), and pursue Individual Service Plan (ISP) goals. Given this wide range of potential interaction

opportunities, DCS staff could continuously interact with the clients during any given shift (8-12 hours).

Reimbursement from the state to agencies that support individuals with IDD is determined by evaluating time spent between DCS and clients. Specifically, DCS documentation should provide specific standards of care that Medicaid reimbursement requires (Parsons & Reid, 1993; Zoder-Martell et al., 2014). For example, Medicaid Title XIX of the Social Security Act promotes the use of ongoing active treatment in programs that support individuals with disabilities. Active treatment, or active support, defined broadly, includes structured and unstructured teaching and training opportunities provided to individuals with IDD (Parsons & Reid, 1993; Totsika, Toogood, Hastings, & McCarthy, 2010). The purpose of active treatment is to enhance the lives of individuals with IDD by engaging them in meaningful, adaptive, and age-appropriate activities (Beadle-Brown, Hutchinson, & Whelton, 2012; Zoder-Martell et al., 2014). Although Medicaid requires active treatment, DCS do not always provide this standard with the clients. Researchers beginning in the early 1970s reported minimal interactions between DCS and clients (Blindert, 1975; Gardner & Giampa, 1971; Chan & Yau, 2002). Since the 1970s, researchers have continued to report on and investigate ways to increase positive and appropriate staff-client interactions (Guercio & Dixon, 2010; van der Meer et al., 2017; Zoder-Martell et al., 2014).

Barriers related to the frequency and quality of staff-client interactions exist. One such barrier relates to the implementation of complicated treatment plans by DCS. This challenge can lead to poor procedural fidelity by DCS who may not understand the plan and may miss opportunities to appropriately interact with clients. Treatment programs

related to behavior change often target appropriate behaviors to maintain or increase, inappropriate behaviors for reduction, or both. A program's effectiveness will likely require high-integrity implementation by DCS (DiGennaro Reed & Codding, 2014; Peter Pipkin, Vollmer, & Sloman, 2010). Therefore, supervisors training DCS to mastery performance on program implementation could increase the likelihood of high treatment integrity and correlate with higher frequencies of staff-client interactions (Arco, 2002, Arco, 2008, Arco & Millet, 1996). After training DCS, research shows that supervisors should then monitor staff's behavior and provide on-the-job performance feedback (van Oorsouw et al., 2009). However, training and monitoring DCS requires resources, such as funding and time, that agencies may not have.

Cullari and Ferguson (1981) identified additional barriers that DCS face that may minimize the frequency and quality of their interactions with clients. Specifically, Cullari and Ferguson noted that DCS lacked appropriate education and training for their responsibilities. Since the publication of Cullari and Ferguson (1981), DCS job requirements have become more complex. For example, responsibilities related to documentation have increased in complexity and frequency. However, the job qualifications, which typically include a high school diploma, a valid driver's license, and passing a criminal background check needed to obtain these positions has remained the same (Crites & Howard, 2011). The increase in job expectations without concurrent adjustment in job qualifications can create barriers to staff-client interactions. Researchers have attempted to address these barriers by identifying key components of effective staff training to better equip staff for their jobs. For example, van Oorsouw et al. (2009) conducted a meta-analysis to categorize goals, format, and techniques of staff

training that positively change DCS behavior. The authors concluded that in-service and on-the-job coaching were the most impactful formats. They also concluded that vocal feedback that includes both praise and correction should always be part of the training.

Although improving and increasing the frequency of staff training is important, it does not relate to low staff retention, which can be another barrier to frequent and appropriate staff-client interactions (Ingham, Riley, Nevin, Evans, & Gair, 2013). Staff turnover is high and consistent in the DCS line of work (Hensel, Lunsky, & Dewa, 2015; Ingham et al., 2013; Vassos, Nankervis, Skerry, & Lante, 2013). Other components that could lead to staff turnover and burnout include its labor-intensiveness and stressful nature. A daily shift of a DCS can include physical lifting of clients to support hygiene tasks such as bathing, clothing, feeding individuals who are unable to do so independently, and being the target of problem behavior such as physical aggression exhibited by clients (Hutchison & Kroese, 2015; Ingham et al., 2013; Rice & Rosen, 1991). Thus, a DCS shift can be physically exhausting and its demands may not warrant the low pay. The physical and emotional demands of the DCS job coupled with the low pay can affect the length of time a worker remains in a DCS position (Outar & Rose, 2017). Researchers have made efforts to address these barriers to staff burnout and staff turnover by improving training so that DCS are prepared for their daily shifts and improving work environments (i.e., reinforcing staff behavior directly; Harchik, Sherman, Sheldon, & Strouse, 1992; Jerome, Kaplan, & Sturmey, 2014). Finding ways to minimize these barriers could lead to improving the frequency and quality of staff-client interactions.

There is a need for high-quality staff-client interactions, effective staff education and training, high program implementation fidelity, and higher rates of staff retention that guide researchers, clinicians, and employers to continuously evaluate methods to meet these needs. Strategies designed to change DCS behavior have included three primary approaches: performance feedback, self-generated feedback, and reinforcement-based approaches. Researchers have demonstrated that all three approaches can effectively change DCS behavior; however, each method has their own benefits and limitations.

A major limitation across all staff training approaches relates to the maintenance of their effects on DCS behavior. Reid et al. (2017) defined maintenance of staff behavior as the "continuation of staff performance following the initial interventions to bring about desired performance and particularly when the interventionists (e.g., behavior analysts) are no longer working with the involved staff" (p. 12). Using this definition of maintenance, few studies reported data during a time period in which the interventionists were no longer working with the individuals (Fleming & Sulzer-Azaroff, 1989; Gil & Carter, 2016). Thus, a lack of maintenance demonstrations, per Reid et al.'s definition, exists. Similarly, for the few studies that have reported on maintenance data (using Reid et al. or any other definition), none provided an experimentally controlled evaluation of variables that impact maintenance. Perhaps by evaluating the maintenance of these approaches, future researchers can determine how to address and measure the gap in the literature.

Performance Feedback Approaches

Numerous researchers have evaluated performance feedback strategies to determine effective ways to change and improve DCS behavior (Arco, 2008; Arco &

Birnbrauer, 1990; van Oorsouw et al, 2009). Researchers have defined performance feedback as providing information to employees about their behavior that included praise, correction, and information or instruction (Arco, 2008; Arco & Birnbrauer, 1990; Bechtel, McGee, Huitema, & Dickinson, 2015; Gabelica, Van den Bossche, Segers, & Gijselaers, 2012). Researchers have also speculated on the behavioral mechanism(s) responsible for the behavior change that occurs following feedback. Specifically, the feedback may change behavior because it serves as a reinforcer or punisher (i.e., it increases or decreases future frequency of behavior). Feedback may instead correspond with behavior change because it functions as conditioned stimulus, discriminative stimulus, or conditioned motivating operation for the staff member's behavior (Johnson, Rocheleau, & Tilka, 2015). Regardless of the behavioral mechanism related to performance feedback, the overall purpose of performance feedback is to bring about immediate change in staff behavior (Arco, 2008).

Researchers have assessed the impact of the temporal locus (immediate or delayed), format (vocal, written, graphic), and style (public or private) of feedback on DCS behavior (Guercio et al., 2005; Kneringer & Page, 1999; Mozingo, Smith, Riordan, Reiss, & Bailey 2006). Researchers and clinicians have provided performance feedback that can be quantitative or qualitative and is meant for changing and maintaining specific behavior. Feedback can be either process or outcome related. Process performance feedback includes information about the DCS's behavior (e.g., their own interactions with clients). Outcome performance feedback includes information about effects on client or others' behavior (e.g., staff implementing a behavior plan and how it affects the client's behavior; Arco, 2008).

Manipulations of feedback could include immediate and frequent, immediate and infrequent, delayed and frequent, or delayed and infrequent. The published literature provides examples of the effects of immediate, frequent feedback, as well as providing delayed, infrequent feedback. Immediate, frequent feedback is the most common and effective form of feedback (Arco & Birnbrauer, 1990; Blough et al., 2006; Wood, Luiselli, & Harchik, 2007; van Oorsouw et al., 2009). However, this type of feedback is not always possible because supervisors may not always be there to provide frequent and immediate feedback to their staff. Researchers have also investigated the use of delayed and infrequent feedback and have demonstrated positive changes of DCS behavior (Alavosius & Sulzer-Azaroff, 1986; Schepis & Reid, 1994). For example, Schepis and Reid (1994) evaluated a program to increase staff-client interactions by providing immediate or delayed feedback. Interactions improved above baseline levels, regardless of the temporal locus of feedback. The research on these manipulations have resulted in DCS behavior change but their immediacy or frequency may not necessarily be the reason for change. Future researchers should evaluate the behavioral mechanism to help understand the function of feedback and identify when feedback is most impactful on behavior.

Several studies have investigated the effectiveness of performance feedback when conducted as an antecedent or consequence-based intervention. Some researchers have found that providing performance feedback prior to a session, observation, or opportunity to respond (i.e., in an antecedent manner)corrects performance and therefore impacts the effectiveness of the feedback (Alvero, Bucklin, & Austin, 2001). Aljadeff-Abergal, Peterson, Wiskirchen, Hagen, and Cole (2017) evaluated the effects of feedback at

different temporal locations (prior or post teaching session). Their results indicated that when researchers provided feedback to students immediately before a teaching session (antecedent), it was more effective in improving the student's teaching skills than when researchers provided feedback afterwards (consequence).

Researchers have evaluated the format (vocal, written, graphic) of feedback to determine its effects on DCS behavior. Vocal feedback represents the most common and most effective type of feedback evaluated (Arco, 2008; Blough et al., 2006; Smith, 1995; van Oorsouw et al., 2009). Researchers have also evaluated the use of written feedback such as typed (i.e., email) or hand-written (i.e., performance review sheet; Fox & Sulzer-Azaroff, 1990). Although limited published research related to emailed feedback with DCS exists, researchers involved in teacher trainings have found emailed feedback to be effective in changing behavior (Barton, Fuller, & Schnitz, 2016; Barton, Kinder, Casey, & Artman, 2011; Barton, Pribble, & Chen, 2013; Barton & Wolery, 2007). Researchers have also investigated graphic feedback by itself as another feedback format (Guercio et al., 2005). After providing an in-service with staff, Guercio et al. (2005) provided public graphs depicting general behavior. Researchers added specific public posting that depicted individual completion scores after a gradual decline in staff performance over the course of four months. Completion of written behavioral programs initially increased after researchers provided specific feedback but then later declined. The researchers then added supervisory responsibilities and completion of programs increased and maintained at around 85% completion. The results of this study indicated that graphic feedback initially increased performance, but that supervisory involvement of some kind might be necessary for maintenance of behavior. Researchers have also investigated graphic

feedback in conjunction with vocal feedback and found that this combined form of feedback changes DCS behavior positively (Blough et al., 2006; Kneringer & Page, 1999). In conclusion, researchers have demonstrated that performance feedback of any form (vocal, written, graphic) improves behavior but vocal performance feedback is the most effective and most commonly used.

Researchers have evaluated the delivery style (private or public) of feedback to DCS to determine its effect on behavior. More studies have investigated private feedback relative to public feedback (Fleming & Sulzer-Azaroff, 1989; Guercio & Dixon, 2010). For example, Guercio and Dixon (2010) met with each participant individually to review videos of staff interacting with clients to provide vocal performance feedback. Researchers have also investigated the use of public feedback to determine its effects on DCS behavior (Towery, Parsons, & Reid, 2014). For example, some researchers publicly posted graphs and provided performance feedback in weekly meetings to determine if any behavior change would occur (Burch, Reiss, & Bailey, 1985; Pampino, MacDonald, Mullin, & Wilder, 2004; Spreat et al., 1985). In some employment contexts, opportunities for supervisors to provide private feedback may be limited. Therefore, researchers have explored ways to effectively use public feedback to change DCS behavior. Evaluating if one form (private or public) is more effective than the other has yet to be determined. A review of public postings of performance feedback conducted by Nordstrom, Lorenzi, and Hall (1991) state that conclusions about under which conditions impact performance greatly cannot be made. They state that feedback interventions and performance posting can be confounded by other variables in the environment (e.g., social competition) and more research parsing out confounds is necessary.

In natural settings, supervisors have provided performance feedback to their staff. However, in many research studies, researchers provided performance feedback to DCS during interventions and not supervisors. Reid et al. (2017) discussed the importance of supervisors providing performance feedback to DCS in that supervisors relate to naturally occurring contingencies (e.g., duty assignments, firing, or promotions) and therefore supervisors could have a greater impact on staff behavior than researchers. Current research is addressing this gap by evaluating the effectiveness of pyramidal training. In a pyramidal training, or train-the-trainer, approach, someone (e.g., researcher) trains a small group of individuals (e.g., supervisors) on a skill and then trains that group how to train others (e.g., DCS) on that skill (Jones, Fremouw, & Carples, 1977; Page, Iwata, & Reid, 1982). This research is currently small and many of the studies report on the training itself and not on the effects of using pyramidal training in the natural environment (Parsons & Reid, 1995; Schlosser, Walker, & Sigafoos, 2006).

In summary, researchers have identified that ongoing, frequent, and specific performance feedback are important and effective in positive behavior change (Arco, 2008; Arco & Birnbrauer, 1990). However, these components can be time-consuming and costly (Arco, 2008; Suda & Miltenberger, 1993). Therefore, finding a cost- and time-effective behavior change method might impact an organization's decision on how they provide feedback to DCS. Thus, another important area of investigation includes identifying strategies that allow for behavior change while minimizing resources. One potential strategy is using a self-generated feedback method.

Self-Generated Feedback Approaches

Many organizations have limited resources; therefore, researchers have evaluated minimalist approaches to changing DCS behavior (Arco, 2008; Reid et al., 1989; Mowery, Miltenberger, & Weil, 2010). Self-generated feedback approaches involve individuals assessing their own performance by taking data and evaluating themselves periodically on the occurrence or nonoccurrence of specific behavior (Cooper, Heron, & Heward, 2007). Self-generated feedback can include self-monitoring. When an individual self-monitors, they provide themselves with process feedback by writing down the occurrence or nonoccurrence of their behavior. In an early example of self-monitoring, Burg, Reid, and Lattimore (1979) provided staff with a small card labeled with client names that was small enough to fit in their pockets. Researchers instructed staff to peel-off a white sticker located next to each client name to indicate when the staff member interacted with them. Since that time, others have replicated these approaches and have required staff to complete a checklist or use an apparatus to self-monitor (i.e., wrist counter) and turn it into their supervisor at the end of their shift (Mowery et al., 2010; Richman, Riodan, Reiss, Pyles, & Bailey, 1988; Sigafoos, Roberts, Couzens, & Caycho, 1992; Suda & Miltenberger, 1993). This approach would result in more highly trained staff while also cutting down on costs by decreasing the need for constant supervision by supervisors.

One purpose of self-generated feedback approaches is to provide individuals with feedback without the need for frequent supervisory feedback. However, the effectiveness of these approaches without supervisory involvement is still of question. For example, Mowery et al. (2010) investigated the influence of a supervisor's presence on the

effectiveness of a self-generated feedback method. They were interested in evaluating any possible reactivity staff might have that would impact the robust nature of the findings related to the intervention evaluated in the study. The authors found that when the supervisor was absent, positive interactions were much lower than when the supervisor was present. The results of this study suggest that the mere presence of the supervisor affected behavior to a greater extent than self-generated feedback alone.

Overall, there is minimal reported research on self-generated feedback approaches and the most recent study of DCS self-monitoring was done by Mowery et al. (2010). Some limitations in self-generated feedback are inaccuracies of recording and potentially laborious or intrusive methods (Arco, 208). Although researchers have demonstrated that performance feedback and self-generated feedback procedures, when packaged together, change DCS behavior, they may not change DCS behavior in a time efficient manner. Therefore, researchers have evaluated another intervention that involves the use of reinforcement-based strategies.

Reinforcement-Based Approaches

Feedback approaches (both external and self-generated) likely change behavior through the process of reinforcement, the literature regarding DCS behavior change specifically refers to approaches that deliver specific rewards for performance as "reinforcement-based approaches." Thus, to be consistent with that literature, that label is used here to describe procedures that provide: (a) monetary rewards, (b) lottery-based rewards, and/or (c) time off from work or avoidance of work responsibilities. There are limited studies (three) that have investigated the use of reinforcement approaches to change DCS behavior within the past 30 years.

Roscoe, Fisher, Glover, and Volkert (2006) provided an example of when the use of monetary rewards impacted staff members' skill acquisition. Specifically, the researchers evaluated the discriminative and reinforcing functions of performance feedback by comparing two conditions on the acquisition of skills involved in conducting preference assessments. One condition involved the researchers providing performance-specific instructions and the other condition involved the researchers providing contingent money with no performance-specific instructions. Acquisition of conducting preference assessments occurred primarily in the condition with performance-specific instructions indicating that performance feedback was necessary for skill acquisition. Cook and Dixon (2006) used lottery rewards in their study evaluating completion of agency forms related to shift responsibilities exhibited by DCS. They investigated the use of three different feedback procedures that consisted of using vocal feedback, vocal plus individual comparative graphic feedback, and vocal feedback, graphic feedback, and a lottery for financial rewards. Percentage of completed forms increased when researchers provided vocal and graphic feedback but greatly increased when researchers added the lottery-based financial incentive program. Courtemanche et al. (2014) investigated ways to increase fidelity of implementing a behavior intervention plan with and without researchers' presence by providing feedback with money and an escape contingency. When researchers were physically present in the environment, all participants accurately implemented the intervention plan. In the researcher's absence, participants only implemented the plan with high levels of integrity when they received feedback and money. The results of all three of these studies indicate that performance feedback is a

necessary component in interventions targeted to change behavior and that researchers can use reinforcement-based approaches to impact positive behavior further.

In this review, three studies have reported using reinforcement-based approaches when studying changing DCS behavior which limits conclusions about the utility of using reinforcement-based approaches (Cook & Dixon, 2006; Courtemanche et al., 2014; Roscoe et al., 2006) . Therefore, future researchers should continue to investigate reinforcement-based approaches to evaluate their effectiveness on positively changing DCS behavior. One reason there are limited studies on using reinforcement-based approaches is that they can be costly to organizations and therefore are typically not the first approaches used in changing DCS behavior (Arco, 2008, Cook & Dixon, 2006).

Summary

The investigation of changing DCS behavior in facilities that provide programs for individuals with disabilities should continue to enable a better understanding of how to train DCS on various skills, such as increasing staff-client interactions. Using performance feedback, self-generated feedback, and reinforcement-based approaches, previous researchers have provided us with stepping stones in establishing programs for efficient and meaningful DCS training and behavior change. Researchers investigating feedback approaches have determined that immediate, vocal , and private feedback to DCS is the most common and effective form of feedback. Researchers using self-generated feedback approaches have determined that when paired with vocal feedback and supervisory presence, DCS behavior will change. Researchers using reinforcement-based approaches have taught us that positive DCS behavior change can occur with a structured incentive procedure. The research investigating how to change DCS behavior

is extensive. However, there appears to be a gap in the literature related to the maintenance of the effects produced by these interventions. Chapter 2 provides a review of the relevant literature on DCS behavior change. This review includes a description of the study's participants (demographics), dependent variables (DV), experimental design (single-case design, SCD or group design), data collection method, interobserver agreement, procedural fidelity, use of mastery criterion, measurement of social validity and generalization. Chapter 2 also provides a closer discussion of the studies, as it pertains to the maintenance of DCS behavior post intervention.

CHAPTER 2

LITERATURE REVIEW

Search Criteria

The primary researcher conducted a systematic electronic search of PsychINFO, ERIC, Academic Search Complete, and Social Science Citation. The search had a date restriction of published articles post 1989 because the researcher wanted to focus on more recent interventions (past 30 years). The search was limited to English language, peer-reviewed articles. The search terms included “direct-care staff,” and “training” and one of the following: “feedback,” “reinforcement,” “instruction,” “self-monitoring,” or “self-management.” The search was limited to articles focused on “direct-care staff” because of the variables present in those working environments, relative to other human service working environment. For example, DCS work in conditions that have different staffing ratios, job requirements, and job qualifications, relative to staff members working in school and clinical environments. The terms “instruction” and “training” were both used to ensure the search encompassed all articles related to DCS training. The researcher also conducted both ancestral and forward searches and used the PRISMA method to collect and finalize articles used in this review (Moher, Liberati, Tetzlaff, & Altman, 2009). Using these methods, the researcher identified a total of 169 articles. Based on the inclusion criteria (described in the following paragraph), the researcher identified and evaluated a total of 27 articles. Of the included articles, 20 evaluated a feedback method,

four evaluated a self-generated feedback method (e.g., self-monitoring), and three evaluated a reinforcement-based program (see Figure 1).

Screening and Inclusion/Exclusion Criteria

The researcher screened articles from the three databases and ancestral and forward searches to determine if each article met inclusion criteria. To be included in this review, the article had to be a peer-reviewed research study examining DCS training. Specifically, for an article to be part of the review it must have included (a) participants who were DCSs working with individuals with IDD, (b) measures of staff behavior as a primary DV along with graphs to visually inspect for SCD studies, (c) specific intervention components of feedback, self-generated feedback method, and/or reinforcement-based method that involved an in-situ training or on-the-job coaching (not just in-service training), (d) published within the last 30 years (1989- present), and (e) report at least three demonstrations of a potential effect (SCD) or used a group design (See Figure 1).

Data Extraction

Setting and Demographics. The researcher extracted the age, sex, experience in the field/setting the study took place, and education level of DCS participants for review. Some studies did not report on all these variables. The researcher collected information on the settings and demographics for descriptive purposes of the participants and to make conclusions about the generalizability of the study.

Dependent variables. Primary DVs of the study had to relate to staff behavior. Researchers reported the following as DVs of interest: assessment of trained skills, staff-client interactions, and completion of permanent products (e.g., agency forms). Eleven of

the 27 reviewed studies measured secondary DVs that related to client appropriate and inappropriate behaviors (Courtemanche et al. 2014; Green et al., 1993; Hrydowy & Martin, 1994; Kneringer & Page, 1999; Parsons et al., 1993; Smidt et al., 2007; Sigafoos et al., 1992; Suda & Miltenberger, 1993; Towery et al., 2014; Wilson et al., 1991; Zoder-Martell et al., 2014). There are limited reports on client behavior change in studies pertaining to changing DCS behavior and Cox, Dube, and Temple (2015) has recently reviewed and discussed this issue in a literature review. Cox and colleagues identified 19 articles that reported on whether staff training influences client challenging behavior. Of those 19 reviewed articles, nine reported improvements in client problematic behavior at post-training. The authors conclude that 19 articles are a small sample size and that future researchers need to continue to examine the relation between staff training and client problem behavior.

Experimental design. Articles that examined DCS behavior reported using both SCD and group designs. Any reviewed article had to use a quantitative method of measurement. All but one of the reviewed articles used a SCD (e.g., multiple-baseline). The researcher visually inspected the studies and followed the Single Case Analysis and Review Framework (SCARF) protocol to examine the quality, rigor, and outcomes of a SCD (Zimmerman & Ledford, 2017; Zimmerman et al., 2018). The researcher evaluated group design studies on the rigor of the design itself and the significance of their results.

Data collection method. Thirteen of the reviewed articles measured the occurrence or nonoccurrence of behavior using a checklist or task analysis. Three articles reported measuring DCS behavior using rate and one article measured DCS behavior by counting occurrences of behavior. Seven articles reported using a time-sampling to

measure DCS behavior (e.g., whole-, partial,- or momentary- interval recording). Two articles used both a task analysis and time-sampling method for measuring DCS behavior. One article measured the DV using a pre/posttest of various quizzes to assess participants' knowledge of behavioral teaching procedures.

Interobserver agreement (IOA). Most researchers who used a SCD reported assessing agreement of observations across all conditions throughout the study. Kazdin (2011) defines IOA as the extent to which observers agree in their scoring of behavior. It is important to assess agreement because it achieves consistency with measuring the true behavior, minimizes observer bias, and reflects whether the behavior is well defined. Observers must work independently during the observation and observers compare scores when the session is over. The observers should achieve high agreement and high accuracy, which refers to whether the data reflects the true behavior.

Procedural fidelity. Procedural fidelity or treatment integrity refers to the extent to which the researcher implements the intervention or IV as planned (Cooper et al., 2007). Four of the 27 reviewed articles reported measuring procedural fidelity (implementation of the IV). The lack of measurement or reporting on procedural fidelity brings into the question the validity of the dependent variable (DV) in response to the IV in question. Missing or reports of low fidelity of an intervention makes it difficult to interpret the results with confidence (Cooper et al., 2007).

Mastery criterion. Seven articles reported using a mastery criterion for assessing participants' acquisition of the targeted skill. Jahr (1998) suggested that competency may be critical for generalization. He stated that displaying competency in a skill decreases the need for constant supervisor feedback and enhances generalization of skill. Studies by

Arco (2002) and Arco and Millet (1995) showed that when researchers trained staff to competency, durable and stable behavior during maintenance followed.

Social validity. Wolf (1978) stated that the social significance of the target behavior, the appropriateness of the procedures, and the social importance of the rules should assess social validity. Readers should not view results from measuring social validity as either effective or that individuals will continue to use the intervention (Cooper et al., 2007). Fourteen articles included measuring social validity of the study, most using self-created surveys. Two studies measured social validity using a previously studied questionnaire to evaluate participants' beliefs about the study and intervention (CHABA; Smidt et al., 2007; Intervention Rating Profile; Zoder-Martell et al., 2014).

Generalization. Stokes and Baer (1977) defined generalization as the occurrence of relevant behavior under different, non-training conditions (i.e., across subjects, settings, people, behaviors, and/or time) without the scheduling of the same events in those conditions (p. 350). Behavior change that appears in a variety of environments or to a variety of behaviors proves to have generality and to be durable change (Baer, Wolf, & Risley, 1968). Four of the 27 reviewed articles reported measuring generalization of DCS behavior. Thus, most of the reviewed studies do not provide much insight into the generalization and durability of the behavior change that occurred during the study.

Results

Table 1 provides a summary of each included study in terms of (a) study type, (b) research design, (c) data collection method, (d) use of mastery criterion, (e) measure of social validity, (f) measure of generalization, and (g) measure of maintenance or follow-

up. Narrative summaries are also provided on the mentioned variables as well as other information on the studies.

Setting and Demographics. Across the 27 articles, studies took place across a range of settings serving individuals with IDD, including residential (state hospitals), community (group homes), and day programs. The age of DCS and supervisors ranged from 18- 64 years and the majority (73 %) were female. Education levels ranged from less than a high school degree to graduate school. Experience working at the facility or with individuals with disabilities ranged from 1 week to over 30 years. Specific setting and demographic information for each study can be found in Tables 2, 3, 4, and 5.

Feedback Approaches.

In the past 30 years, 26 articles met inclusion criteria for this review using a performance feedback method with DCS. Six of the articles published within the past 30 years were excluded after examining the rigor of the experimental design (see Table 6). These studies did not report at least three demonstrations of a potential effect (Arco, 1991; Blough et al., 2006; Embregts, 2003; Guercio et al. 2005; Jensen et al., 1992; Mozingo et al., 2006). Prior to 1989, nine articles were published related to changing DCS behavior and using performance feedback as an intervention (see Table 5).

Supervisors and researchers primarily provided process performance feedback to DCS within the intervention. However, one study (Towery et al., 2014), provided both process feedback (staff performance) and outcome feedback (level of client independence) to DCS. Researchers and supervisors served as the primary source of delivering performance feedback to DCS. Researchers provided performance feedback in 17 studies, supervisors provided performance feedback in six studies, and both

researchers and supervisors provided performance feedback in four studies (See Table 1). Two studies demonstrated feedback delivered by non-supervisors (i.e., institutional staff that did not hold authority over the participants but were experts in their field or agency trainers) favorably changed DCS behavior (Fox & Sulzer-Azaroff, 1990; Smith, 1995). When determining whether a researcher or supervisor should provide performance feedback, there are some researchers that stress the importance of involving supervisors related to the social validity of the intervention and potentially the maintenance of the intervention (Reid et al., 2017).

Researchers have attempted to identify how the timing of feedback affects performance (Aljadeff-Abergal et al., 2017). In the reviewed studies, performance feedback was primarily provided immediately to DCS. However, four studies reported delaying performance feedback and reported a change in DCS behavior following a feedback intervention (Green et al., 2002; Parsons et al., 1993; Schepis & Reid, 1994; Wilson et al., 1991). The context in which the staff member received performance feedback (privately or public) could impact its effectiveness. Typically, the researcher or supervisor provided performance feedback privately to DCS. However, in five studies, researchers reported providing performance feedback publicly, and demonstrated favorable behavior change in staff behavior (Fox & Sulzer-Azaroff, 1990; Gil & Carter, 2016; Kneringer & Page, 1999; Towery et al., 2014; Wilson et al., 1991).

Researchers manipulated performance feedback approaches in four ways. The most common feedback method for DCS was to provide it immediately and vocally (i.e., spoken). Twelve articles provided DCS with vocal feedback only (Green et al., 2002; Harchik et al., 1992; Parsons & Reid, 1995; Parsons et al., 1993; Parsons et al., 2013;

Schepis & Reid, 1994; Smidt et al., 2007; Smith, 1995; Towery et al., 2014; Wilson et al., 1991; Wood et al., 2007; Zoder-Martell et al., 2014). The second most common method of providing performance feedback was through written documentation that specified DCSs' correct and incorrect behavior. One study (Fox & Sulzer-Azaroff, 1990) reported using written performance feedback only, while four studies (Fleming & Sulzer-Azaroff, 1989; Green et al., 1993; Guercio & Dixon, 2010; Hrydowy & Martin, 1994) provided performance feedback both using both vocal and written formats. The third most common method of providing performance feedback was by providing a graph of DCS behavior to the DCS. Two articles reported vocal and graphic feedback (Gil & Carter, 2016; Kneringer & Page, 1999). The fourth method of performance feedback was using video recordings of DCS behavior to review with staff and pairing it with vocal feedback to change behavior (Guercio & Dixon, 2010). All methods and variations changed DCS performance behavior from baseline data collection (e.g., increased staff-client interactions or increased skill acquisition). However, some researchers suggest that vocal performance feedback is the most effective (van Oorsouw et al, 2009).

Study characteristics.

Dependent variables. Of the 20 articles that evaluated using performance feedback, primary DVs included assessment of trained skills (13; Fleming & Sulzer-Azaroff, 1989; Fox & Sulzer-Azaroff, 1990; Green et al., 1993; Harchik et al., 1992; Hrydowy & Martin, 1994; Kneringer & Page, 1999; Parsons & Reid, 1995; Parsons et al., 1993; Parsons et al., 2013; Schlosser et al., 2006; Smith, 1995; Wilson et al., 1991; Wood et al., 2007), staff-client interactions (six; Guercio & Dixon, 2010; Harchik et al., 1992; Schepis & Reid, 1994; Smidt et al., 2007; Towery et al., 2014; Zoder-Martell et al.,

2014), and percentage of completed permanent products (two; Gil & Carter, 2016; Green et al., 2002). Most studies that used performance feedback as an intervention focused on evaluating DCS behavior pertaining to a specific skill (e.g., prompting method, client intervention plan). However, some articles also focused on measuring and increasing staff-client interactions which has been a variable of interest to change since the 1970s.

Of the 20 articles that evaluated a feedback method, eight articles measured and reported on client behaviors (appropriate and inappropriate) as secondary DVs (Green et al., 1993; Hrydowy & Martin, 1994; Kneringer & Page, 1999; Parsons et al., 1993; Smidt et al., 2007; Towery et al., 2014; Wilson et al., 1991; Zoder-Martell et al., 2014). Arco (2008) recommended that researchers should evaluate client behavior and outcomes first. Based off those results, researchers should then focus on what staff behavior to change. He also stated that providing both process and outcome feedback is crucial in changing DCS behavior. Arco stated that outcome feedback connects staff behavior with its resulting effects on client behavior and that staff are more likely to experience positive and natural changes. However, research has yet to evaluate these statements.

***Study design*.** All reviewed studies reported SCD and one study reported using a group design (repeated measures and between groups design) and a SCD (multiple probe; Parsons et al., 1993). Researchers have yet to determine cohesiveness among performance feedback components (Arco, 2008). Therefore, using SCD allows for close examination of behavior change regarding specific feedback components at the individual level. Parsons et al. (1993) were interested in evaluating a program to train staff in behavioral teaching strategies as opposed to evaluating the effects of specific feedback components. Across three experiments, the authors used pre-posttests to evaluate

behavior change. Although there were changes in test scores, there were no direct observations of behavior change in two of the three experiments. In their second study, they used a multiple probe design to evaluate supervisor behavior. However, researchers only observed participant behavior two or three times and two of the four participants declined in performing correct teaching skills in the last observation, making it difficult to conclude a stable trend in the data.

Of the 20 articles that evaluated a performance feedback method, 10 employed a multiple baseline design (concurrent: Fox & Sulzer-Azaroff, 1990; Gil & Carter, 2016; Guercio & Dixon, 2010; Hrydowy & Martin, 1994; Kneringer & Page, 1999; Smith, 1995; Wilson et al., 1991; Wood et al., 2007; nonconcurrent: Fleming & Sulzer-Azaroff, 1989; Wood et al., 2007; Zoder-Martell et al., 2014). Some strengths of a multiple baseline design include the gradual application of intervention to each participant and its allowance for an evaluation and demonstration of intra-participant direct replication (Gast, Lloyd, & Ledford, 2018). Some limitations of this design include delays intervention while additional baseline sessions are conducted across participants, behaviors, or contexts, and the need for frequent measurement, which can be time-consuming. (Gast et al., 2018; Kazdin, 2011). Three reviewed articles reported using a nonconcurrent multiple baseline. History and maturation threats are major concerns in all nonconcurrent multiple baseline designs and some view using this design for more practicality purposes than for demonstrating experimental control (Gast et al., 2018).

Nine studies reported using a multiple probe design (Green et al., 1993; Green et al., 2002; Parsons & Reid, 1995; Parsons et al., 1993; Parsons et al., 2013; Schepis & Reid, 1994; Schlosser et al., 2006; Smidt et al., 2007; Towery et al., 2014). Along with

design related weaknesses, seven reviewed studies were limited in that they reported aggregated data (means) as opposed to individual data (Gil & Carter, 2016; Green et al., 1993; Hrydowy & Martin, 1994; Parsons et al., 2013; Smidt et al., 2007; Towery et al., 2014; Wilson et al., 1991). This approach can skew the data and inflate actual results. Finally, a limitation in Parsons and Reid (1995) study was that it did not include three data points during intervention. This relative lack of data minimized the ability to determine a functional relation. The discussion of determining how many data points are needed to demonstrate a functional relation has been the topic of many discussions in the SCD field (Kratochwill et al., 2010, 2013; Tate et al., 2016). Consensus among SCD experts is that repeated demonstrations of controlled behavior change are needed to demonstrate experimental control and relatively few data points precludes such demonstrations.

Taken collectively, these studies yield 11 clear demonstrations of experimental control (Green et al., 1993; Green et al., 2002; Harchik et al., 1992; Hrydowy & Martin, 1994; Kneringer & Page, 1999; Parsons et al., 2013; Schepis & Reid, 1994; Schlosser et al., 2006; Smith, 1995; Towery et al., 2014; Wilson et al., 1991). In nine cases, data are suggestive of an effect but limited due to using a non-concurrent baseline (Fleming & Sulzer-Azaroff, 1989; Wood et al., 2007; Zoder-Martell et al., 2014), variability in the trend data in the intervention condition (Fox & Sulzer-Azaroff, 1990; Guercio & Dixon, 2010), changes in behavior in a tier not targeted for intervention (Gil & Carter, 2016), minimal data collected in conditions (Parsons & Reid, 1995), no direct observation of behavior taken (Parsons et al., 1993); and minimal to no difference in data across baseline and intervention conditions (Smidt et al., 2007).

Data collection strategy. All but one article reported direct measures to assess DCS behavior (pre/posttests, Parsons et al., 1993). Of the 20 articles that evaluated a feedback method, data collection for one article included time-sampling such as whole-, partial-, or momentary-interval recording (Green et al., 1993). Five articles measured DCS behavior using rate (Schepis & Reid, 1994; Schlosser et al., 2006; Smidt et al., 2007; Wilson et al., 1991; Zoder-Martell et al., 2014) and 11 measured the occurrence or nonoccurrence of behavior using a task analysis (Fleming & Sulzer-Azaroff, 1989; Fox & Sulzer-Azaroff, 1990; Gil & Carter, 2016; Green et al., 2002; Guercio & Dixon, 2010; Kneringer & Page, 1999; Parsons & Reid, 1995; Parsons et al., 2013; Smith, 1995; Towery et al., 2014; Wood et al., 2007). Two articles reported both time sampling and occurrence or nonoccurrence of behavior using a task analysis (Harchik et al., 1992; Hrydowy & Martin, 1994). The use of frequent, direct measurement minimizes subjectivity in data and strengths the rigor of the study.

Interobserver Agreement and Procedural Fidelity. Most studies reported interobserver agreement (IOA) across study conditions, ranging from 14-83% of observations. Fox and Sulzer-Azaroff (1990) did not report how often researchers collected IOA, the agreement percentage, or how they calculated IOA. Their description was vague and did not provide any data on IOA. Gil and Carter (2016) did not report any IOA, which is concerning. Readers should evaluate the Gil and Carter results critically. The most common method for calculating IOA was point-by-point agreement (Fleming & Sulzer-Azaroff, 1989; Green et al., 1993; Guercio & Dixon, 2010; Harchik et al., 1992; Hrydowy & Martin, 1994; Parsons et al., 2013; Schepis & Reid, 1994; Smidt et al., 2007; Smith, 1995; Towery et al., 2014; Wilson et al., 1991; Wood et al., 2007; Zoder-Martell

et al., 2014). One study did not report on how they calculated IOA (Green et al., 2002). Articles that reported interobserver agreement ranged from 0-100%. Readers should critically evaluate studies that report low agreement coefficients and evaluate how researchers calculated IOA to identify any limitations (Fleming & Sulzer-Azaroff, 1989; Green et al., 1993; Guercio & Dixon, 2010; Harchik et al., 1992; Hrydowy & Martin, 1994; Parsons & Reid, 1995; Parsons et al., 2013; Schepis & Reid, 1994; Smidt et al., 2007; Smith, 1995; Towery et al., 2014; Wilson et al., 1991; Zoder-Martell et al., 2014).

Three studies reported measuring procedural fidelity (implementation of the independent variable; IV) across all conditions; Harchik et al., 1992; Hrydowy & Martin, 1994; Zoder-Martell et al., 2014). Harchik et al. (1992) reported collecting procedural fidelity data for 10% of the sessions and reported the mean agreement percentage was 84%. Hrydowy and Martin (1994) reported collected procedural reliability data during use of the performance checklist and reported that the mean agreement percentage was 100%. Zoder-Martell et al. (2014) evaluated procedural fidelity in 100% of sessions and the experimenter accurately completed components 100% of the time. The lack of procedural fidelity measurement in the reviewed studies is concerning when evaluating the strength of a study's intervention. Moving forward, researchers should measure and report on procedural fidelity to ensure that the experimental procedures are being conducted as intended.

***Mastery criterion*.** Three of the 20 articles stated the researchers used a mastery criterion for measuring staff's performance and to determine a point in the study in which they proceeded to the next phase (Green et al., 2002; Parsons & Reid, 1995; Parsons et al., 1993). All researchers reported measuring staff performance with a checklist or task

analysis and required participants to perform at criteria levels over multiple consecutive session (e.g., 80% across three consecutive sessions). Incorporating a mastery criterion of DCS performance is important in measuring a level of competency however, researchers rarely included it in feedback intervention studies.

***Social validity*.** Of the 20 articles that reported evaluations of feedback approaches, ten measured social validity (Fox & Sulzer-Azaroff, 1990; Harchik et al., 1992; Hrydowy & Martin, 1994; Kneringer & Page, 1999; Parsons & Reid, 1995; Parsons et al., 1993; Parsons et al., 2013; Schepis & Reid, 1994; Towery et al., 2014; Zoder-Martell et al., 2014). Seven studies created their own social validity questionnaire (Fox & Sulzer-Azaroff, 1990; Harchik et al., 1992; Hrydowy & Martin, 1994; Parsons et al., 1993; Parsons et al., 2013; Schepis & Reid, 1994; Towery et al., 2014). Two studies used a previously studied questionnaire (CHABA; Smidt et al., 2007; Intervention Rating Profile; Zoder-Martell et al., 2014). Overall, all studies reported that those who completed the social validity surveys rated the interventions as favorable, likeable, and helpful. Researchers measure and report on social validity to promote the idea that people accept the methods and outcomes of an intervention (Cooper et al., 2007).

***Generalization*.** Of the 20 articles on feedback approaches, two reported generalization of staff behavior (Hrydowy & Martin, 1994; Wilson et al., 1991). Hrydowy and Martin (1994) measured generalization of an untrained time of day with untrained clients and found an increase in behavioral training skills. Wilson et al. (1991) measured the generalization of an untrained skill and found that staff increased their performance only for work behaviors for which they received feedback. These limited

reports of measuring and capturing generalization of a skill is a gap in the literature that future researchers need to address.

Self-Generated Feedback Approaches

In the past 30 years, six articles related a self-generated feedback strategy for DCS met inclusion criteria for this review. Two of the reviewed articles were excluded after examining the rigor of the experimental design due to reporting less than three demonstrations of a potential effect (See Table 6; Doerner et al., 1989; Richman et al., 1988). Prior to 1989, five articles have been published (See Table 5).

The reviewed studies on self-generated feedback approaches also included immediate and vocal feedback to DCS from supervisors or researchers as an intervention component (Mowery et al., 2010; Sigafoos et al., 1992; Suda & Miltenberger, 1993). Mowery et al. (2010) initially used a staff management package that involved self-monitoring and tactile prompts to evaluate the influence of a supervisor's presence on DCS behavior. They later added a condition in which supervisor feedback was provided because participants did not meet mastery performance. Sigafoos et al. (1992) provided vocal feedback to participants directly after they observed the participant engage in sandwich making with the client and complete a self-monitoring form. Suda and Miltenberger (1993) evaluated the minimal necessary components of a self-management program to increase positive interactions between staff and clients. Their self-management program included instructions, goal setting, self-monitoring, self-evaluation, and self-praise. They provided performance feedback when self-management did not increase interactions to criterion level. Morris and Ellis (1997) provided performance

feedback vocally and graphically to participants on DCS self-reported recording of reinforcer deliveries.

Study characteristics.

Dependent variables. All four articles that evaluated a self-generated feedback method measured staff-client interactions as their primary variable in a variety of ways (e.g., using a checklist on an index card or a MotivAider; Morris & Ellis, 1997; Mowery et al., 2010; Sigafoos, et al., 1992; Suda & Miltenberger, 1993). Like the articles that evaluated performance feedback, the focus of staff-client interactions in these studies demonstrates the importance researchers put on this behavior. Two articles measured appropriate and inappropriate client behavior as secondary variables (Sigafoos et al., 1992; Suda & Miltenberger, 1993). The articles that also measured client behavior minimized the gap in the research pertaining to identifying what effect staff training has on client behavior. If the purpose of improving staff training is to positively impact client behavior, future researchers should also measure client behavior.

***Study design*.** Three reviewed studies included used a multiple baseline SCD (Mowery et al., 2010; Sigafoos et al., 1992; Suda & Miltenberger, 1993) and one study used a reversal type design (Morris & Ellis, 1997). Mowery et al. (2010) used a concurrent multiple baseline across participants with an alternating treatments design in baseline and intervention phase (supervisor absent/present). Two individuals required an additional treatment component (feedback), because of the lack of behavior change. With this addition, positive interactions between staff and clients increased. There are few data points that overlap between baseline and intervention which may indicate the strength of this intervention. Sigafoos et al. (1992) used a concurrent multiple baseline across dyads

(staff and client) to measure staff-client interactions. Authors reported at least three data points for each dyad and in each phase. The is some overlap in data points and perhaps more data points would provide a trend in data. However, increases in staff-client interactions and skills occurred for all dyads. Suda and Miltenberger (1993) used a nonconcurrent multiple baseline across participants design to evaluate staff-client interactions. Researchers did not measure baseline behavior concurrently because two participants dropped out before the self-management method was implemented. There were overlapping data points for four of the six participants, which suggests the need for additional data to demonstrate stability and the opportunity for greater differentiation. Morris and Ellis (1997) used an A-B-A-B-BD-B or an A-C-A-C-CD-C design to measure the number of reinforcer deliveries recorded by DCS. Intervention conditions included vocal feedback (B), graphic feedback (C), vocal feedback with praise (BD), and graphic feedback with praise (CD). Performance feedback was either delivered at the beginning of a shift or at the end. Researchers conducted 20, 40-min correspondence checks with the self-monitoring intervention to ensure fidelity of the intervention. Number of reinforcers delivered increased and number of problem behaviors decreased in seven of the eight participants. One strength in using this design is the repeated phases to identify replication of any IV effects on the DV. One limitation in using this design is the withdrawal of an intervention (Kazdin, 2011).

Taken collectively, these studies yielded no clear demonstrations of experimental control. In all four cases, data were suggestive of an effect but limited due to using a non-concurrent baseline design (Suda and Miltenberger, 1993), reporting an increasing trend in baseline conditions (Sigafoos et al., 1992), changes in behavior in a tier not targeted

for intervention (Sigafoos et al., 1992; Suda and Miltenberger, 1993), minimal to no difference in data across baseline and intervention conditions (Morris & Ellis, 1997; Suda and Miltenberger, 1993), and prior to the inclusion of performance feedback due to the lack of behavior change when self-generated feedback method was used alone (Mowery et al., 2010; Suda and Miltenberger, 1993).

***Data collection strategy*.** Four of the reviewed self-generated feedback articles reported direct measures to assess DCS behavior. In three studies, researchers collected data using duration based or time-sampling procedures such as whole-, partial-, or momentary-interval recording (Mowery et al., 2010; Sigafoos et al., 1992; Suda & Miltenberger, 1993). These measures were appropriate for estimating the occurrence of an ongoing behavior, such as staff-client interactions. A whole-interval recording strategy could underestimate the percentage of interactions, while partial-interval recording measurement could overestimate occurrence. Momentary-interval recording is limiting in that it only captures what is happening at the exact moment the interval is signaled but is used to primarily measure continuous behaviors such as engagement (Cooper et al., 2007). Morris and Ellis (1997) used event recording to measure the number of recorded reinforcer deliveries and problem behavior.

Interobserver agreement and procedural fidelity. Researchers calculated interobserver agreement in all four studies, ranging from 16%- 40% of all conditions. In the Mowery et al. (2010) study, the researchers calculated the percent of agreement by dividing the number of intervals with agreements by the number of intervals with agreements plus disagreements. Researchers defined an agreement as both observers agreeing that the behavior did or did not occur. Researchers calculated IOA coefficients

during 29-33% of sessions. Reliability scores ranged from 72-100%. Sigafoos et al. (1992) reported measurement of IOA in 16-40% of all sessions. A point-by-point calculation was used, and agreement ranged from 74-100%. In the Suda and Miltenberger (1993) study, researchers calculated IOA for 20% of the observations. The authors do not specify if researchers measured IOA in both baseline and intervention. Four studies used a point-by-point measurement. Morris and Ellis (1997) reported an agreement of correspondence data but did not specify how they calculated IOA or when they collected IOA data. Researchers did not collect procedural fidelity data in the reviewed studies.

***Mastery criterion*.** Suda and Miltenberger (1993) reported using a mastery criterion to determine if staff demonstrated meaningful change in their interactions with clients. They used a criterion of 30% of intervals for positive interactions that was determined from a previous study(Doerner et al., 1989). Two of the four participants underwent an additional condition that involved performance feedback because they were not performing at criterion levels.

***Social validity*.** Three articles measured the social validity of their study (Mowery et al., 2010; Sigafoos, et al., 1992; Suda & Miltenberger, 1993). Mowery et al. (2010) and Sigafoos et al. (1992) reported all staff rated the project as "valuable" and indicated that they enjoyed it. They also rated "some" to "very much" related to whether clients learned new skills. Suda and Miltenberger (1993) reported staff rating procedures as acceptable, but with great variability. Staff rated the self-management component as less acceptable than instructions and goal setting.

***Generalization*.** Two studies on self-generated feedback approaches measured generalization of staff behavior (Sigafoos et al., 1992; Suda & Miltenberger, 1993).

Sigafoos et al. (1992) collected data on staff-client behavior in untrained activities. Variability of data (increase/decrease) occurred in all participants and from baseline to intervention thus not demonstrating a strong generalization effect. Suda and Miltenberger (1993) reported generalized behavior of increased staff-client interactions during the self-management phase.

Reinforcement-Based Approaches

In the past 30 years, three articles met the inclusion criteria for this review using a reinforcement-based method with DCS (Cook & Dixon, 2006; Courtemanche et al. 2014; Roscoe et al., 2006). Prior to 1989, seven articles had been published (See Table 5). All three reviewed studies that utilized a reinforcement-based method also provided some type of performance feedback. Researchers provided process feedback in different ways. Courtemanche et al. (2014) provided feedback to DCS on how to implement intervention plans immediately and vocally. Roscoe et al. (2006) provided vocal and delayed (before the next training session began) feedback on conducting two types of preference assessments. Cook and Dixon (2006) provided three different feedback procedures that included vocal feedback only, vocal plus graphic feedback, and vocal and graphic feedback plus a lottery system.

Reviewed articles on reinforcement-based approaches included both positive and negative contingencies. Positive reinforcement programs included delayed reinforcers (i.e., turning in a lottery ticket; Cook & Dixon, 2006) and immediate reinforcers (i.e., money; Courtemanche et al. 2014; Roscoe et al., 2006). One reviewed study investigated a negative reinforcement program that involved staff escaping additional training if staff did not meet mastery performance (Courtemanche et al. 2014).

Study characteristics.

Dependent variables. Of the three articles that evaluated a reinforcement-based method, primary DVs included trained skills (Courtemanche et al. 2014; Roscoe et al., 2006) and completion of agency forms or checklists (Cook & Dixon, 2006). Courtemanche et al. (2014) was the only study that reported on client behaviors. The secondary DVs in the Courtemanche et al. study included client inappropriate behaviors (i.e., self-injurious behaviors). The data on client behavior adds to the limited literature on what effect staff training has on client behavior.

***Study design*.** All reviewed reinforcement-based method studies reported a SCD, specifically a multiple baseline. Cook and Dixon (2006) used a concurrent multiple baseline across participants and demonstrated behavior change in all four participants and in all three phases. There were at least three data points in each phase and the greatest behavior change occurred when researchers implemented the lottery phase (highest data points). Courtemanche et al. (2014) used a concurrent multiple baseline design across dyads (staff and client), and demonstrated behavior change in all three dyads. There were at least three data points in each phase; however, there was some overlap in data points from baseline which could indicate a need for more data. Roscoe et al. (2006) used a concurrent multiple baseline across participants design and demonstrated behavior change in all legs of the study with all four participants. Instructions alone changed behavior for three of the four participants, and when researchers added feedback alone or contingent money alone phases, the percentage of correct behavior increased for all participants. Percentage of correct behavior were highest for all participants in the feedback plus contingent money phase. Taken collectively, these studies yielded three

clear demonstrations of experimental control (Cook & Dixon, 2006; Courtemanche et al. 2014; Roscoe et al., 2006). However, in the Roscoe et al. (2006) study, the addition of performance feedback to contingent money resulted in the highest percentage of correct behavior.

***Data collection strategy*.** All reviewed studies used a checklist or task analysis and researchers measured DCS behavior directly (Cook & Dixon, 2006; Courtemanche et al. 2014; Roscoe et al., 2006). This use of direct measurement was specific to each task or skill taught and allowed the researcher to provide direct feedback to the trainee on what step(s) they missed.

Interobserver Agreement and Procedural Integrity. All three reviewed studies reported obtaining IOA for at least 15%, and at most 40% of sessions. Researchers used a point-by-point comparison to calculate the findings in all three studies. Courtemanche et al. (2014) was the only reviewed article that reported measuring treatment integrity on the BIP trainer's implementation of staff training. There were no reported data on procedural integrity collected in other conditions of the study. Researcher took procedural integrity data during 33% of treatment sessions and calculated 100% fidelity in each phase. The lack of reported procedural integrity in studies raised questions regarding implementation of the IV. Specifically, given the lack of procedural fidelity data, it remained unclear whether or not the researchers implemented the IV as intended, and whether the IV was responsible for behavior change (Cooper et al., 2007).

***Mastery criterion*.** Researchers in two studies reported using a mastery criterion for measuring staff's performance (Courtemanche et al., 2014; Roscoe et al., 2006). Their

use of a mastery criterion strengthened the design by adding an objective benchmark for when participants moved onto the next phase (i.e., new training phase or maintenance).

***Social validity*.** Courtemanche et al. (2014) measured the social validity of their study to assess the social appropriateness of the procedures and outcomes. They assessed staff member opinions and had outside reviewers collect data from video recordings to assess behavior change from baseline to intervention. Staff members reported that they liked the intervention and felt confident in implementing the behavior plan with clients.

***Generalization*.** Of the three articles on reinforcement-based method, no reviewed article reported measuring generalization of staff behavior. This is a large gap in this type of literature in that researchers or clinicians might be restricted to using this type of intervention to specific behaviors or settings.

Discussion, Conclusion, and Future Direction

The researcher compiled descriptive results for 27 articles that reviewed interventions for changing DCS behavior. Studies that measured DCS behavior as their primary DV and used a specific procedure (i.e., feedback, self-generated feedback, or reinforcement-based procedure) were included in this review, making it unique from previous literature reviews. Previous reviews have focused on what effect staff training had on clients with challenging behavior (Cox et al., 2014), what components in staff training were related to improvements in staff behavior (van Oorsouw et al., 2009), and focused on studies that only examined feedback for changing staff performance (Arco, 2008).

Researchers have used feedback, self-generated feedback, and reinforcement-based strategies to improve DCS behavior. Supervisors or researchers typically provided

performance feedback to DCS immediately and privately and varied in their delivery method (vocally, written, graphical, or use of video). Performance feedback approaches changed DCS behavior, but they are time consuming. Self-generated feedback programs demonstrated effective DCS behavior change when performance feedback was added to the intervention. There were also limited reports of client behavior, so it is difficult to determine overall client behavior change, relative to staff behavior change. Self-generated feedback approaches required supervisor involvement and the reliability of these programs is limited. Reinforcement-based procedures can effectively change DCS behavior but can require additional resources which likely means additional costs.

Several studies across staff training methods focused on staff-client interactions, which suggested researchers found this behavior important to attend to. Indeed, some researchers have indicated that there is a need to increase the frequency of such interactions because increased interactions might be associated with better client outcomes (Cox et al., 2014). In the proposed study, we chose to focus on staff-client interactions for this reason.

Although each study demonstrated positive change in DCS behavior, some authors noted limitations. Two studies identified short or limited observation periods that could constrict the data as limitations (Cook & Dixon, 2006; Zoder-Martell et al., 2014). Some studies stated lack of data on client behavior, lack of generalization data, lack of social validity, lack of procedural fidelity measured, and lack of long-term maintenance/follow-up limited their study (Green et al., 1993; Morris & Ellis, 1997; Mowery et al., 2010; Parsons et al., 1993; Sigafoos et al., 1992; Smith, 1995; Suda & Miltenberger, 1993; Zoder-Martell et al., 2014). Other limitations not noted by the

authors include observer reactivity, variability in the data, potential bias in the participation pool (e.g., they were motivated to participate), and reliability of staff self-recording.

There are several ways to change staff behavior, as demonstrated in the existing research. However, it is unclear what specific procedures might be effective at maintaining those changes in DCS behavior. Of the 27 reviewed articles, seven reported measuring maintenance of DCS behavior (Fleming & Sulzer-Azaroff, 1989; Gil & Carter, 2016; Kneringer & Page, 1999; Sigafoos et al., 1992; Suda & Miltenberger, 1993; Wilson et al., 1991; Zoder-Martell et al., 2014). Researchers collected maintenance data over time periods that ranged from 1 week to 12 months post-intervention.

Two articles reported performance remaining high during the maintenance phase (Kneringer & Page, 1999; Wilson et al., 1991), However, they reported group and not individual data. Issues related to measuring group and not individual data pertain to misrepresentation in individual performance, it masks variability in the data, and intrasubject replication is absent from group designs (Cooper et al., 2007). In the Kneringer and Page (1999) article, performance feedback provided by the supervisor was reduced from once a week to once a month. Staff performance of correct nutritional practices remained high during the maintenance phase, but the authors reported on group and not individual data, making it hard to determine individual performance. In the Wilson et al. (1991) article, the supervisor decreased the feedback frequency from daily to weekly. The cumulative graphs showed additive effects of every response in two of the three groups during maintenance. The researchers demonstrated maintenance of performance but again, the researchers reported on group and not individual data.

Measuring behavior at the group level makes it difficult to determine the impact of a given intervention on any given individual's behavior. In addition, group behavior measures are susceptible to outlier bias such that the performance of one staff member could affect the data in a certain direction. Although group design is a viable option, it is does not capture what is needed for changing behavior at the individual level.

Three of the studies reviewed did not change procedures from intervention in the maintenance phase. In the Sigafoos et al. (1992) article, the researcher provided performance feedback to DCS in the same manner (pre- and post-observation) as the intervention condition. This approach does not meet the definition of maintenance provided by Reid et al. (2017). Therefore, it is difficult to evaluate maintenance of behavior change produced by the procedures described in the Sigafoos et al. study. In the Suda and Miltenberger (1993) article, the supervisor provided performance feedback during maintenance that was identical to the intervention procedures. There were also only two to four data points collected over the course of two weeks following intervention, which limits that ability to critically evaluate maintenance. Gil and Carter (2016) minimized their involvement by training supervisors on how to collect data in the maintenance phase. During intervention, supervisors presented bar graphs for each home regarding their percentage of compliance of completed data cards and sign-in sheets, monthly performance feedback sessions, and set monthly goals. During maintenance, researchers trained the supervisory assistants in how to collect data and calculate percentages. Researchers only conducted one or two probes that occurred approximately three months post intervention. These authors did not report if procedures changed from intervention to maintenance.

Two articles added performance feedback in the maintenance phase when appropriate behavior decreased. Zoder-Martell et al. (2014) did not provide performance feedback in the intervention phase. Instead, they only provided in-the-ear prompts to staff. However, when researchers assessed for maintenance, performance levels dropped for one individual and the researchers provided vocal performance feedback to positively impact behavior. Given this additional training, readers cannot assess maintenance of performance feedback in this study. In the Fleming and Sulzer-Azaroff (1989) article, experimenters removed performance feedback regarding staff's self-care skills teaching during the maintenance phase until the last observation. However, researchers did not collect data post-feedback session in the maintenance phase. Again, this lack of maintenance data does not provide the field with conclusive results pertaining to the maintenance of DCS behavior change following training interventions.

The most common procedure used during the maintenance phase was continuous monitoring with performance feedback. Although some researchers have reported on maintenance, they have yet to evaluate variables that impact maintenance. One variable that is of interest is the frequency with which supervisors monitor and provide feedback to staff after staff have improved. For example, Hrydowy and Martin (1994) did not report on maintenance but did systematically alter feedback frequencies throughout their conditions (once a week, twice a week, and once every two weeks). Although this study's measurement in their final phase does not meet the technical definition of maintenance provided by Reid et al. (2017), it does describe one way to evaluate feedback frequencies.

Extending Hrydowy and Martin's (1994) manipulation of feedback frequencies into the maintenance phase might provide information regarding the impact of varying

frequencies of performance feedback to maintain mastery level performance following intervention. Given the limited reports on maintenance behavior in this review, the researcher proposes an experiment that will evaluate the impact of different feedback frequencies during the post-intervention phase on continued performance. Thus, the purpose of the proposed experiment was to evaluate the relative impact of different feedback frequencies on appropriate staff-client interactions exhibited by DCS.

CHAPTER 3

METHOD

Participants and Setting

At the time of this study, a total of 11 DCS were working at the facility. Ten DCS signed consent to participate but we chose only five DCS to focus on. Five female DCS with various education backgrounds and work experiences (see Table 7) participated in the study. Researchers recruited participants from a day program that provided vocational, transitional, and behavioral services to 55 adults with IDD whose levels of communication and independence with daily living skills varied. The service director referred all DCS for participation, but individual participation was voluntary.

Materials

Data collectors recorded appropriate staff-client interactions using a momentary time sampling (15-s intervals) data sheet to record staff behaviors (Appendix A) and an app called “interval” (iPhone version). Secondary data collectors also used procedural fidelity forms (Appendix B) to measure integrity of the IV throughout the study. Participants received written instructions about appropriate staff-client interactions prior to Phase 2 (Appendix C) and session feedback forms (Appendix D) in Phases 3 and 4.

Dependent Variable, Response Definitions, and Measurement

The primary DV was appropriate staff-client interactions defined based on previous research (Burg et al., 1979; Burgio, Whitman, & Reid, 1983; Schepis & Reid, 1994). The specific definition was: any intelligible vocalization directed toward a client

(including manual sign, use of picture cards, and AAC devices), a physical response involving a client (e.g. head nods, winks, high fives, pats on the back, fist bumps, etc.), or participating in an activity with a client. Further, to be considered an appropriate staff-client interaction, the interaction had to denote approval of a client or his/her behavior, such as providing praise, engaging in an activity with the client (e.g., playing Uno), commenting on what the client was doing, or providing a rationale or a replacement behavior for inappropriate client behavior. If staff and clients were engaged in an activity together, researchers coded three consecutive intervals of silence as an appropriate interaction. After three consecutive intervals of concurrent engagement with an activity without speaking to the client, researchers coded the next interval without new interaction as *no interaction*. However, a disrupter could reset the interval recording. Disrupters included staff looking away from the activity or client(s), checking their cell phone, or speaking with staff. Once they resumed looking at either the activity or client, or spoke to any nearby client, the three consecutive intervals would reset. Researchers coded interaction during concurrent activity engagement this way for two reasons: (1) some staff would engage in the same activity with clients but would not speak to them for long periods of time and (2) naturally occurring conversations do not necessarily include ongoing vocal interaction on a continuous basis when engaged in an activity. An *inappropriate interaction* was defined as any interaction denoting disapproval of a client or his/her behavior. For example, telling a client to stop doing something without providing a rationale or explanation of a replacement behavior was considered an inappropriate interaction (e.g., “stop doing that”). *No interaction* was defined as when staff was not looking at any individual within arm’s reach, was not engaged in an activity

with a client, or was engaged in an activity with the client, but did not otherwise interact with them for more than three consecutive intervals.

The researcher used a 15-s MTS recording system to capture appropriate staff-client interactions because interactions could vary in length and did not necessarily have a discrete beginning and end time. MTS can potentially result in missed behavior, resulting in an underestimate of behavior. To guard against this potential issue, preliminary data on staff-client interactions were taken. These data provided an estimate of the time length for these interactions so that an MTS interval could be selected that reduced the likelihood of underestimation. Specifically, the researchers observed 2 hours of staff-client interactions exhibited by multiple staff members. The average duration per occurrence of these interactions was then calculated, and the researcher used that value to set the interval length used during the study. Ledford, Ayres, Lane, and Lam (2015) recommend this strategy for determining interval length because it allows for best fit between the behavior to be measured and the actual occurrence of the behavior. Observations of participants throughout the study were typically 10-15 min in length and data collectors used the iPhone app "interval" to count the intervals. Sometimes observations occurred throughout the day for all participants. For Participant 1, observations ranged 1-2 times a day during baseline, 1-5 times a day during the post in-service phase, 1-3 times a day during the session performance feedback phase, and 1-4 times a day during the maintenance phase. For Participant 2, observations ranged 1-3 times a day during baseline, post in-service, and session performance feedback phases and 1-4 times a day during the maintenance phase. For Participant 3, observations ranged 1-2 times a day during baseline and 1-4 times a day during post in-service and session

performance feedback phases. For Participant 4, observations ranged 1-2 times a day during baseline, 1-5 times a day during the post in-service phase, and 1-3 times a day during the session performance feedback phase.

Interobserver Agreement

The primary researcher and four graduate students (researcher assistants, RAs) from a Special Education training program served as observers. For at least 20% of all sessions (range 20-100, mean 90%) across all conditions and phases, a second, independent observer collected data on DCS behavior. A second observer did not collect data for the AM small group maintenance probe for Participant 1. The researcher (primary data collector) began an observation by counting down from three and pressing the "start" button at the same time as the second data collector. Two types of interobserver agreement coefficients were calculated: (1) exact occurrence, and (2) nonoccurrence agreement. Exact occurrence agreement was calculated by comparing the observers' records on an interval-by-interval basis. Specifically, an interval was scored as an agreement if both observers recorded the same behavior in that interval. An interval was scored as a disagreement if the secondary data collector recorded a different behavior in that interval from the primary. Agreements and disagreements were then summed and divided by the total number of intervals in which one or both observers recorded the behavior. Nonoccurrence agreement coefficients were calculated in a similar manner. Again, the observers' records were compared on an interval-by-interval basis. An interval was scored as an agreement if both observers did not record the behavior in that interval. An interval was scored as a disagreement if only one observer recorded the behavior in that interval. Agreements and disagreements were then summed and divided by the total

number of intervals in which one or both observers did not record the behavior. During the study, IOA calculations were closely monitored. The researcher made necessary changes to the DV definition during early observations in baseline to capture true instances of behavior. Secondary observers were also re-educated and trained on definitions throughout the study.

Participant 1. A second independent observer collected data during baseline 33-67% of observations and IOA for appropriate staff-client interactions ranged from 93-100% (*M* = 97%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged from 52-96% (*M*=82%). The second observer collected IOA during the post in-service training phase for 25-63% of observations and IOA for appropriate staff-client interactions ranged from 58-100% (*M* = 89%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged from 85-100% (*M* =94%). The second observer collected IOA during the session performance feedback phase for 33-75% of observations and IOA for appropriate staff-client interactions ranged from 82-100% (*M* = 94%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged from 29-100% (*M* =80%). The second observer collected IOA during the maintenance phase for 0-50% of observations and IOA for appropriate staff-client interactions ranged from 86-100% (*M* = 96%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged from 50-100% (*M* =79%). The second observer did not collect IOA for the one AM small group maintenance probe.

Participant 2. A second independent observer collected data during baseline 33-67% of observations and IOA for appropriate staff-client interactions ranged from 67-

100% (*M* = 87%), inappropriate staff-client interactions ranged from 0-100% (one instance of inappropriate staff-client interaction was recorded by the primary data collector in one observation), and no interaction IOA ranged from 85-100% (*M* =97%). The second observer collected IOA during the post in-service training phase for 40-60% of observations and IOA for appropriate staff-client interactions ranged from 80-100% (*M* = 93%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged from 71-100% (*M* =95%). The second observer collected IOA during the session performance feedback phase for 60-80% of observations and IOA for appropriate staff-client interactions ranged from 83-100% (*M* = 93%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged from 78-100% (*M* =93%). The second observer collected IOA during the maintenance phase for 29-100% of observations and IOA for appropriate staff-client interactions ranged from 86-100% (*M* = 96%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged from 88-100% (*M* =95%).

Participant 3. A second independent observer collected data during baseline 33-100% of observations and IOA for appropriate staff-client interactions ranged from 0-94% (*M* = 73%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged from 49-99% (*M* = 81%). IOA for appropriate staff-client interactions was low in the first AM baseline session due to low occurrence of appropriate staff-client interactions (only two were recorded by the primary data collector in this first observation). This low agreement was only noted in the first observation of Participant 3. The second observer collected IOA during the post in-service training phase for 40-80% of observations and IOA for appropriate staff-client interactions ranged

from 72-100% (*M* = 88%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged 79-100% (*M* =94%). The second observer collected IOA during the session performance feedback phase for 20-100% of observations and IOA for appropriate staff-client interactions ranged from 73-100% (*M* = 95%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged 50-100% (*M* =91%).

Participant 4. A second independent observer collected data during baseline 33-67% of observations and IOA for appropriate staff-client interactions ranged from 75-100% (*M* = 89%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged 90-100% (*M* =97%). The second observer collected IOA during the post in-service training phase for 40-57% of observations and IOA for appropriate staff-client interactions ranged from 50-100% (*M* = 83%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged 50-100% (*M* =92%). The second observer collected IOA during the session performance feedback phase for 40-75% of observations and IOA for appropriate staff-client interactions ranged from 88-100% (*M* = 95%), inappropriate staff-client interactions were 100% for all sessions, and no interaction IOA ranged from 82-100% (*M* =97%).

Participant 5. A second independent observer collected data during baseline 50-100% of observations and IOA for appropriate staff-client interactions ranged from 55-93% (*M* = 78%), inappropriate staff-client interactions ranged from 0-100% for all sessions , and no interaction IOA ranged 82-100% (*M* =96%). IOA for appropriate staff-client interactions was low in the first AM baseline session due to low occurrence of appropriate staff-client interactions (only one was recorded by the primary data collector

in this first observation). This low agreement was only noted in the first observation of Participant 4.

Experimental Design

The researchers used an alternating treatments design to evaluate the effectiveness of session performance feedback and the effect of two feedback frequencies (following every third or every sixth observation) on the maintenance of appropriate staff-client interactions. These conditions alternated across time periods. The researchers measured appropriate staff-client interactions during two time periods, from among three (AM small group, lunchtime, or PM small group), targeted for intervention based on baseline measurements of minimal occurrence of behavior. The researchers also evaluated effects of the in-service training on behavior change using this design.

Procedures

Baseline. During baseline, the researcher and RAs observed staff behavior during several activities that took place between 9AM and 3PM. Participants did not receive feedback from the researchers during this phase. Staff were aware data were collected but did not know what behaviors were measured. Researchers attempted to decrease reactivity by taking data on staff behavior over the course of one month, two to five times a week, prior to the beginning of the intervention phases. The researcher used baseline performance to identify the two time periods with the lowest level of appropriate staff-client interactions. These time periods would be targeted for intervention in Phases 3 and 4. In-service training began after baseline data were stable.

Phase 1: In-Service Training: Behavioral Skills Training. Over the course of two days, the researcher held two, 1-hour in-service, small-group (4 to 5 DCS) trainings

that described the importance of appropriate staff-client interactions and reviewed how to interact with clients in an appropriate manner. The training used examples and non-examples from previous studies that examined staff-client interactions (Guercio & Dixon, 2010; Finn & Sturmey, 2009; Mowery et al., 2010; Schepis & Reid, 1994; Sigafoos, et al., 1992; Smidt et al., 2007; Suda & Miltenberger, 1993; Zoder-Martell et al., 2014). The in-service training included four components: instructions (vocal and written), modeling, role-play, and feedback (i.e., BST). The researcher chose to use a BST package for the in-service training because of its empirical support in the staff training literature (Ingersoll & Wainer, 2013; Matthews & Hagopian, 2014; Nosik, Williams, Garrido, & Lee, 2013; Wang, 2017). Each role-play included 10 opportunities for staff to appropriately interact with the researchers. The role-plays were semi-scripted, in that the RAs told DCS what the role-play scenario was (e.g., focus group time, art, lunch) and the RAs told the researcher what type of client they would be (compliant and vocal, compliant and non-vocal, noncompliant and vocal, or noncompliant and non-vocal). Staff role-played with the researchers until their staff-client interactions during the role play were appropriate during at least 90% of the interaction opportunities for three consecutive role-plays. Once the staff member met this criterion, they moved on to Phase 2. See Appendix C for instructions, model and role-play scenarios, and the in-service training data sheet.

Phase 2: Post In-Service Training. Following the in-service, researchers collected data on DCS behavior to determine if the in-service training would increase appropriate staff-client interactions. Researchers did not provide feedback during this post-in-service training phase. Researchers observed and recorded staff-client interactions during the two targeted time periods and an untargeted time period (to serve as a control)

1 to 12 times per week. If participant's appropriate staff-client interactions increased during this phase, the researcher continued to monitor behavior to assess for any change and monitor maintenance of the in-service training effects. If participant's appropriate staff-client interactions either remained low and stable, or on a decreasing trend during this phase, they moved on to Phase 3.

Phase 3: Session Performance Feedback (Vocal and Written). A vocal statement was provided at the beginning of each day to each participant privately regarding when they would be observed. This statement was brief (e.g., "you will be observed today sometime during lunch") and did not give an exact time the observation(s) would occur or provide any information related to the participant's performance. The researcher began providing feedback during the two targeted time periods following every observation. Session performance feedback occurred within 5-15 min following an observation. The primary researcher provided written and vocal feedback to the DCS in a private setting (i.e., in the training room). Written and vocal feedback included what the staff did correctly, what to work on to improve appropriate staff-client interactions, and the percentage of intervals with appropriate staff-client interactions during that observation. Phase 3 continued until appropriate staff-client interactions levels (a) increased relative to Phase 2, and (b) were differentiated in both feedback conditions, relative to the no-feedback control condition. Once these criteria were met, the participant moved to Phase 4.

Phase 4 : Maintenance. The researcher flipped a coin twice to determine whether a condition was assigned to more frequent (after every third) or less frequent (after every sixth) performance feedback. The first coin flip determined what condition

would be assigned (heads= lunchtime, tails= PM small group) and the second coin flip determined the feedback frequency (heads= every third, tails=every sixth). Next, the researcher minimized their support of the intervention during this phase in two different ways. First, participants were no longer informed at the beginning of the day if an observation would take place. The researcher told the participants once at the beginning of the phase that they would continue to be observed during lunch and PM small group time, but that they would receive feedback on their performance randomly. Second, the researcher varied the frequency of session performance feedback following an observation by either providing feedback after every third or after every sixth observation. When they did receive performance feedback, the researcher gave them their feedback forms from the previous (first two or first five) observations in which they did not receive immediate feedback. The researcher provided vocal feedback on only the immediate previous observation (the third or sixth targeted observation). The researcher did not review the other observations with the participants but did give them the feedback forms for them to review on their own. This phase continued until at least one occurrence of feedback was provided in each condition. As many observations as possible were conducted to allow for differentiation to occur.

Procedural Fidelity

A second data collector evaluated procedural fidelity during the in-service training for all but one participant. During the other conditions (baseline, post in-service training, session performance feedback phase, and maintenance phase), the second data collector measured procedural fidelity during 0-100% of observations. Other researchers collected procedural fidelity data on the researcher's implementation of the IV using a

task analysis checklist that listed the behaviors they were supposed to be engaging in, based on the experimental phase (i.e., components of BST during the in-service, and providing feedback vocally and in written fashion during the session performance feedback phase). Integrity coefficients were calculated by dividing the number of steps that the experimenter accurately implemented by the total number of steps for a given session.

Participant 1. Procedural fidelity data were collected during the same observations during which data were collected for IOA purposes. For Participant 1, fidelity was assessed during 33-67% of baseline observations, and was 100% across all sessions. Fidelity data were collected during 25-63% of the post in-service training phase observations and was 100% across all sessions. Fidelity data were collected during 33-75% of the session performance feedback phase observations and was 100% across all sessions. Fidelity data were collected during 0-50% of the maintenance phase observations and was 100% across all sessions. Fidelity was not collected for the one AM small group maintenance probe.

Participant 2. Procedural fidelity data were collected during the same observations during which data were collected for IOA purposes. For Participant 2, fidelity was assessed during 33-67% of baseline observations, and was 100% across all sessions. Fidelity data were collected during 80-100% of the post in-service training phase observations and was 100% across all sessions. Fidelity data were collected during 60-80% of the session performance feedback phase observations and was 100% across all sessions. Fidelity data were collected during 29-100% of the maintenance phase observations and was 100% across all sessions.

Participant 3. Procedural fidelity data were collected during the same observations during which data were collected for IOA purposes. For Participant 3, fidelity was assessed during 33-100% of baseline observations, and was 100% across all sessions. Fidelity data were collected during 40-80% of the post in-service training phase observations and was 100% across all sessions. Fidelity data were collected during 20-100% of the session performance feedback phase observations and was 100% across all sessions.

Participant 4. Procedural fidelity data were collected during the same observations during which data were collected for IOA purposes. For Participant 4, fidelity was assessed during 33-67% of baseline observations, and was 100% across all sessions. Fidelity data were collected during 40-57% of the post in-service training phase observations and was 100% across all sessions. Fidelity data were collected during 40-75% of the session performance feedback phase observations and was 100% across all sessions.

Participant 5. For Participant 5, fidelity was assessed during baseline 50-100% of observations and was at 100% across all sessions.

CHAPTER 4

RESULTS

Figures 3-7 show the percent of intervals with appropriate staff-client interactions during baseline, post-in-service, session performance feedback, and maintenance phases. Observations are noted on the x-axis of each graph and the percentage of intervals with appropriate staff-client interactions is represented on the y-axis.

Baseline

During AM small groups, appropriate staff-client interactions ranged from 3-97% of intervals across all five participants (M = 44%). During lunchtime, appropriate staff-client interactions ranged from 3-57% of intervals across all five participants (*M* = 28%). During PM small group, appropriate staff-client interactions ranged from 2-77% of intervals across all five participants (*M* =35%).

Participant 1. During AM small group, Participant 1 exhibited appropriate staff-client interactions during 87-97% of intervals (*M* = 93%). During lunchtime, she exhibited appropriate staff-client interactions during 38-57% of intervals (*M* = 47%). During PM small group, she exhibited appropriate staff-client interactions during 38-77% of intervals (*M* = 59%). Her appropriate staff-client interactions decreased throughout these observations.

Participant 2. During AM small group, Participant 2 exhibited appropriate staff-client interactions with clients 55-72% of intervals (*M* = 65%). During lunchtime, she exhibited appropriate staff-client interactions during 9-48% of intervals (*M* = 33%), with

responding on a decreasing trend. During PM small group, she exhibited appropriate staff-client interactions with clients 2-13% of intervals (*M*= 7%).

Participant 3. During AM small group, Participant 3 exhibited appropriate staff-client interactions with clients 3-58% of intervals (*M* = 25%). During lunchtime, she exhibited appropriate staff-client interactions with clients 8-33% of intervals (*M* = 24%). During PM small group, she exhibited appropriate staff-client interactions with clients 20-57% of intervals (*M* = 38%) and exhibited inappropriate staff-client interactions during 2% of intervals.

Participant 4. During AM small group, Participant 4 exhibited appropriate staff-client interactions with clients 14-43% of intervals (*M* = 26%) and exhibited inappropriate staff-client interactions 2% of intervals. During lunchtime, she exhibited appropriate staff-client interactions with clients 3-6% of intervals (*M*= 5%). During PM small group, she exhibited appropriate staff-client interactions with clients 15-68% of intervals (*M* = 47%).

Participant 5. During AM small group, Participant 5 exhibited appropriate staff-client interactions with clients 23-54% of intervals (*M* = 33%) and exhibited inappropriate staff-client interactions during 1% of intervals. During lunchtime, she exhibited appropriate staff-client interactions with clients 22-42% of intervals (*M*= 32%). During PM small group, she exhibited appropriate staff-client interactions with clients 9-37% of intervals (*M*= 25%). After nine observations, this participant chose to remove herself from the study.

Phase 1: In-Service Training

Four participants took part in the in-service training. As part of the training, each participant exhibited appropriate staff-client interactions during 90% of opportunities or above across three consecutive staff-client role-plays with the researcher. During the in-service training, Participant 1 achieved 100%, 90% and 100% during her role-play session. Participant 2 achieved 100% across all three consecutive role-play sessions. Participant 3 achieved 90%, 100%, and 100% across her role-play sessions. Participant 4 achieved 100%, 90%, and 100% during her role-play sessions.

Phase 2: Post In-Service Training

Four participants moved into the post in-service training phase. Appropriate staff-client interactions during AM small group ranged from 4-95% of intervals across the four participants, (M = 40%). The range and mean of appropriate staff-client interactions across all participants during AM small group decreased slightly from baseline observations. Appropriate staff-client interactions during lunchtime ranged from 2-47% of intervals across participants, (M = 26%). The range and mean of interactions across all participants during lunchtime decreased slightly from baseline observations. Appropriate staff-client interactions during PM small group ranged from 7-47% of intervals across participants, (M = 21%). Interactions during this time period decreased the most from baseline levels when compared to the other time periods. Participant 1 interacted appropriately during the highest percentage of intervals during AM small group. Therefore, this time period was designated as the control condition (i.e., no intervention). The other two time periods were assigned to intervention for Phase 3, to be followed by assignment to different maintenance schedules during Phase 4.

Participant 1. During AM small group, Participant 1 exhibited appropriate staff-client interactions with clients 4-73% of intervals, (*M* = 46%). During lunchtime, she exhibited appropriate staff-client interactions with clients 16-47% of intervals, (*M*= 33%). During PM small group, she exhibited appropriate staff-client interactions with clients 8-36% of intervals, (*M*= 26%). Her mean level of appropriate staff-client interactions decreased from baseline levels. Her responding in AM small group was on a decreasing trend while her responding in lunchtime and PM small group was low and variable (i.e., no trend but not stable) in trend.

Participant 2. During AM small group, Participant 2 exhibited appropriate staff-client interactions with clients 8-43% of intervals (*M*= 30%). During lunchtime, she exhibited appropriate staff-client interactions with clients 2-31% of intervals, (*M* = 14%) and exhibited inappropriate staff-client interactions during 2% of intervals. During PM small group, she exhibited appropriate staff-client interactions with clients 8-47% of intervals, (*M*= 28%) and exhibited inappropriate staff-client interactions during 2% of intervals. Her appropriate staff-client interactions decreased during AM small group and lunchtime but increased slightly in PM small group observations. Her appropriate staff-client interactions during AM small group and lunchtime were below baseline, but on an upward trend. Her responding in PM small group was on a decreasing trend.

Participant 3. During AM small group, Participant 3 exhibited appropriate staff-client interactions with clients 22-57% of intervals, (*M* = 41%). During lunchtime, she exhibited appropriate staff-client interactions with clients 5-43% of intervals, (*M* = 33%). During PM small group, she exhibited appropriate staff-client interactions with clients 7-18% of intervals, (*M* = 12%) . Her appropriate staff-client interactions increased slightly

from baseline levels during AM small group and lunchtime observations but decreased in PM small group observations. Her appropriate staff-client interactions during AM small group and lunchtime were decreasing in trend overall while her appropriate staff-client interactions during PM small group were low and stable.

Participant 4. During AM small group, Participant 4 exhibited appropriate staff-client interactions with clients 10-95% of intervals, (*M* = 38%) and exhibited inappropriate staff-client interactions during 2% of intervals. During lunchtime, she exhibited appropriate staff-client interactions with clients 3-53% of intervals, (*M* = 26%). During PM small group, she exhibited appropriate staff-client interactions with clients 7-33% of intervals, (*M* = 19%). Her appropriate staff-client interactions with clients increased from baseline levels but decreased in PM small group observations. Her appropriate staff-client interactions during lunchtime and PM small group observations were decreasing in trend, while her appropriate staff-client interactions during AM small group were variable.

Phase 3: Session Performance Feedback (Vocal and Written).

Four DCS received session performance feedback (i.e., on-the-job coaching) during lunchtime and PM small group times. All participants' appropriate staff-client interactions increased during this phase. The AM small group time served as the control condition (i.e., no intervention) for all participants. Appropriate staff-client interactions ranged from 2-97% of intervals across participants, (*M* = 51%) during this control condition. Appropriate staff-client interactions during lunchtime ranged from 3-91% of intervals across the three participants, (*M* = 68%). Appropriate staff-client interactions during PM small group ranged from 13-97% of intervals across participants, (*M* = 76%).

Participant 1. During the control condition (AM small group), Participant 1 exhibited appropriate staff-client interactions with clients 38-85% of intervals, (*M* = 60%). Lunchtime was targeted for intervention, and after the initial observation with session performance feedback (57% of intervals), she exhibited appropriate staff-client interactions with clients 75-91% of intervals, (*M* = 78%). PM small group was also targeted for intervention and she exhibited appropriate staff-client interactions with clients 80-100% of intervals, (*M* = 93%). Appropriate staff-client interactions increased in the two targeted time periods while the control condition increased initially but then was on a decreasing trend, demonstrating a functional relation between session performance feedback and appropriate staff-client interactions

Participant 2. During the control condition (AM small group), Participant 2 exhibited appropriate staff-client interactions with clients 2-63% of intervals, (*M* = 41%). Lunchtime was targeted for intervention and she exhibited appropriate staff-client interactions with clients 63-80% of intervals, (*M* = 72%). PM small group was also targeted for intervention and after the initial observation with session performance feedback (48% of intervals), she exhibited appropriate staff-client interactions with clients 48-92% of intervals, (*M* = 79%). Appropriate staff-client interactions increased in the targeted time periods from post in-service observations. Appropriate staff-client interactions during AM small group initially increased from post in-service observations but then decreased and remained below the targeted time periods, demonstrating a functional relation between session performance feedback and appropriate staff-client interactions.

Participant 3. During the control condition(AM small group), Participant 3 exhibited appropriate staff-client interactions with clients 18-77% of intervals, (*M* = 36%). Lunchtime was targeted for intervention and after the initial observation with session performance feedback (3% of intervals), she exhibited appropriate staff-client interactions with clients 3-83% of intervals, (*M* = 56%). PM small group was also targeted for intervention and she exhibited appropriate staff-client interactions with clients 61-83% of intervals, (*M* = 71%). Appropriate staff-client interactions decreased during AM small group observations but increased during the targeted time periods (lunchtime and PM small group), demonstrating a functional relation between session performance feedback and appropriate staff-client interactions. Due to many absences, Participant 3 did not move to Phase 4.

Participant 4. During the control condition, AM small group, Participant 4 exhibited appropriate staff-client interactions with clients 10-97% of intervals of intervals, (*M* = 68%). Lunchtime was targeted for intervention and she exhibited appropriate staff-client interactions with clients 50-69% of intervals, (*M* = 59%). PM small group was also targeted for intervention and after the initial observation with session performance feedback (13% of intervals), she exhibited appropriate staff-client interactions with clients 13-100% of intervals, (*M* = 66%). Appropriate staff-client interactions during AM small group increased from post in-service observations but was on a decreasing trend. During the two targeted time periods and the control period, appropriate staff-client interactions increased and remained higher than post in-service levels. Through visual analysis of her data, there is not a clear demonstration of a

functional relation between session performance feedback and appropriate staff-client interactions. Due to many absences, Participant 4 did not move to Phase 4.

Phase 4: Maintenance

Two participants moved into the maintenance phase. Both participants exhibited decreased levels of appropriate staff-client interactions relative to Phase 3 in both the lunchtime and PM small group times. Appropriate staff-client interactions during lunchtime ranged from 35-96% of intervals across participants, (*M* =67%). During PM small group, appropriate staff-client interactions ranged from 45-100% of intervals across participants (*M* = 72%). One AM small group observation probe was taken for Participant 1 and 2 (0% and 6% of intervals, respectfully).

Participant 1. One observation probe was taken during AM small group and appropriate staff-client interactions occurred during 0% of intervals. Lunchtime was targeted for performance feedback (vocal and written) following every third observation. Participant 1 exhibited appropriate staff-client interactions with clients 60-96% of intervals, (*M* = 80%). Appropriate staff-client interactions increased slightly from the session performance feedback phase (*M*= 78%). PM small group was targeted for performance feedback following every sixth observation and she exhibited appropriate staff-client interactions with clients 47-100% of intervals, (*M* = 77%). Appropriate staff-client interactions during this time decreased from the session performance feedback phase (*M* =93%). There was no clear differentiation between the two feedback frequencies during this phase.

Participant 2. One observation probe was taken during AM small group and appropriate staff-client interactions was 6% of intervals. Lunchtime was targeted for

performance feedback (vocal and written) following every sixth observation. Participant 2 exhibited appropriate staff-client interactions with clients 35-62% of intervals, (*M* = 52%). PM small group was targeted for performance feedback following every third observation and she exhibited appropriate staff-client interactions with clients 45-80% of intervals, (*M* = 63%). Appropriate staff-client interactions in lunchtime and PM small group decreased when feedback was thinned. There was some differentiation between the two feedback frequencies during this phase. During PM small group (targeted for performance feedback following every third observation), appropriate interactions remained higher than lunchtime (targeted for every sixth) and was on an increasing trend.

CHAPTER 5

DISCUSSION

Five DCS were recruited to participate in a study to evaluate the effects of different frequencies of DCS performance feedback on the maintenance of appropriate staff-client interactions. Five participants were involved in baseline observations, but one participant dropped out during this phase. The remaining four staff members participated in a BST in-service related to appropriate staff-client interactions and their appropriate staff-client interactions were subsequently measured during a post training phase (Phase 2). Appropriate staff-client interactions occurred at low levels across participants, and each moved on to Phase 3 (session performance feedback). During Phase 3, all four participants increased their appropriate staff-client interactions following their first observation with feedback. Due to the large number of staff absences from Participants 3 and 4, they did not move to the last phase, maintenance. During this final phase, performance feedback delivered to the remaining two participants was thinned from following every observation to once at the beginning of the phase and following every third or every sixth observation. For both participants, appropriate staff-client interactions decreased during this phase, relative to Phase 3. When performance feedback was provided, regardless of what time period (e.g., lunch or PM), appropriate staff-client interactions increased half the time in the subsequent observation, regardless of condition. This effect appeared to vary across participants. For Participant 1, when the researcher provided performance feedback, the following observation would include an

increase in performance. For Participant 2, she increased her appropriate staff-client interactions once in the observation following performance feedback.

Appropriate staff-client interactions increased when the researcher delivered session feedback to DCS in Phase 3 and 4. Appropriate staff-client interactions had the most sustained effect on performance when feedback (vocal and written) were delivered following every observed session. When feedback delivery was thinned to either every third or every sixth observation, appropriate staff-client interactions varied among the two participants and decreased relative to performance during Phase 3, but not to baseline levels. However, following a session during which feedback was provided, appropriate staff-client interactions for Participant 1 would sometimes increase initially, but performance did not maintain or stabilize at high levels. There was no clear differentiation between the feedback frequencies for Participant 1. For Participant 2, there was some differentiation in that PM small group (targeted for performance feedback following every third observation) in the beginning of maintenance observations but this differentiation did not continue after the fifth observation.

These findings support previous research pertaining to staff training and its effects on behavior. First, the in-service training that included BST did not have a large effect on appropriate staff-client interactions during post in-service training observations. Three of the four participants showed no change in responding, based on visual analysis of the data from Phase 1 to Phase 2. One participant (Participant 1) exhibited a decreased level of appropriate staff-client interactions following BST, relative to before BST. The lack of effectiveness of BST on changing staff-client interactions in the natural environment aligns with previous research regarding the effects of in-service training in real-world

settings. A flaw in BST is that many of the studies on BST demonstrate a change in behavior during the training (i.e., during the role play and feedback phases), but behavior observed during role play does not generalize to application in the natural environment (Harchik et al., 2001; Jerome et al., 2014; Shapiro & Kazemi, 2017). Additional on-the-job coaching is then provided to participants to increase or maintain positive behavior change. This additional training and on-the-job support are deemed essential components of staff training by van Oorsouw et al (2009).

Second, all participants increased their appropriate staff-client interactions when the researcher provided session performance feedback. The findings of this study support the previous research related to on-the-job coaching (session performance feedback) and immediate, frequent feedback provided to participants (Arco & Birnbrauer, 1990; Blough et al., 2006; Wood et al., 2007; van Oorsouw et al., 2009). For example, Wood et al. (2007) taught staff to use the Picture Exchange Communication System (PECS) with an adult with IDD using a BST package and on-the-job feedback. Post training observations included immediate performance feedback discussions between the researcher and staff that included an overview of the observation, praise, corrections, and suggestions for future performance. All four staff improved their implementation of using PECS and three maintained their performance at high levels with the continuation of immediate, frequent feedback. Although this study differed by thinning the frequency of feedback in the maintenance phase, participant performance was affected when feedback was provided. In the maintenance phase for Participant 1, when the researcher provided feedback following an observation, appropriate staff-client interactions increased initially in the observation that occurred after feedback was provided. However, when the

researcher did not provide consistent feedback, responding declined. For Participant 2, appropriate staff-client interactions increased following feedback in only one observation.

Third, appropriate staff-client interactions decreased when the schedule of performance feedback was thinned. Specifically, appropriate staff-client interactions decreased across participants, with Participant 2 exhibiting greater reduction in responding than Participant 1. This outcome aligns with the research demonstrating that more frequent and immediate feedback produces optimal results (Arco & Birnbrauer, 1990; Blough et al., 2006; Wood et al., 2007; van Oorsouw et al., 2009). Decreasing session performance feedback had a negative impact on appropriate staff-client interactions which varies somewhat from the literature. There were only two reviewed studies that thinned the frequency of their feedback (Kneringer & Page, 1999; Wilson et al., 1991). In the Kneringer and Page (1999) study, the supervisor decreased their feedback from once a week to once a month and in the Wilson et al. (1991) study, the supervisor decreased the feedback frequency from daily to weekly. Participant performance maintained at high levels when their feedback was thinned. However, there were supervisors providing performance feedback in the studies and not a researcher, like the current study. Both studies also reported on group data, making it hard to determine behavior change at the individual level. In the current study that evaluated feedback frequencies on the maintenance of DCS behavior, there was also no differential effect between the two feedback frequencies (following every third or sixth observation). This finding is like Schepis and Reid (1994). The authors provided immediate or delayed feedback and staff-client interactions increased. Interactions improved above baseline levels, regardless of the temporal locus of feedback. The research on these manipulations

have resulted in DCS behavior change but their immediacy or frequency may not necessarily be the reason for change.

Limitations.

Several limitations impacted the outcomes and interpretation of this study's results. These limitations can be organized into procedural/methodology limitations and conceptual limitations. There are four limitations related to procedures/methodology. First, the researcher, who was not a supervisor, provided feedback. Reid et al. (2017) reiterated what others have studied and said it was critical for supervisors to provide performance feedback to DCS (Mayer et al. 2014; Reid 2004; Sigurdsson & Austin 2006). Supervisors relate to naturally occurring contingencies (e.g., duty assignments, firing, or promotions) and therefore supervisors could have a greater impact on staff behavior than researchers (Reid et al., 2017). However, some research has shown DCS behavior change following feedback from non-supervisors (Fox & Sulzer-Azaroff, 1990; Smith, 1995). Fox and Sulzer-Azaroff (1990) evaluated the effectiveness of two feedback sources (supervisors and staff experts in fire evacuation procedures) increasing percentages of assigned fire evacuation training trials conducted by DCS. They found that regardless of the feedback source, the percentage of assigned training trials conducted increased. Smith (1995) evaluated the impact of trainer (researcher) feedback and supervisor feedback on compliance and adequate staff performance. Staff performance increased when the trainer provided feedback but increased and maintained at a higher percentage when the supervisor provided feedback. In this study, the supervisor for this facility did not provide immediate, frequent feedback. The supervisor provided minimal to no feedback to DCS outside of the annual review sessions.

Therefore, when the researcher began providing feedback to participants, it was novel to the environment.

Second, the use of an alternating treatments design might have resulted in carryover effects. Evaluating the data paths in the participants using visual analysis, one might see potential carryover effects. Most participants' interactions increased during the AM small group phase once the session performance feedback phase was initiated, which might indicate carryover effects from targeted time periods. However, for Participant 1 and 2, their appropriate staff-client interactions during AM small group observations initially increased, but declined over time, thus indicating that feedback in the targeted time periods were the reason for change. Participant 3's AM small group interactions increased for one observation, but then remained low and similar to baseline and post in-service levels. Participant 4's AM small group staff-client interactions varied but were on a decreasing trend.

A third limitation related to the procedures of this study might be that the session performance feedback phase was too short, and therefore the researcher did not adequately train staff to competency. Previous research related to staff training have used mastery criteria to determine staff performance related to acquisition of a skill. Seven of the 27 reviewed articles reported using a mastery criterion for assessing participants' acquisition of the targeted skill (Courtemanche et al., 2014; Green et al., 2002; Parsons & Reid, 1995; Parsons et al., 1993; Roscoe et al., 2006; Suda & Miltenberger, 1993). Previous researchers have discussed the importance of competency for generalization and decreases the need for constant supervisor supervision and feedback (Jahr, 1998).

Perhaps by extending the session performance feedback phase, participants would have increased their interactions more consistently during observations in Phase 4.

A fourth limitation related to the procedures of this study is the frequency of performance feedback during the maintenance phase. Performance feedback was provided after every third or after every sixth observation. Multiple observations occurred throughout this phase for both participants (1-4 times a day). Perhaps these frequencies of feedback were not differentiated enough and therefore might be the reason for the lack of behavior difference between the two frequencies.

There are two conceptual limitations. First, this study does not identify the mechanism for change or lack of change in this study. Previous researchers have investigated the behavior mechanism(s) responsible for the behavior change that occurs following feedback (Arco, 2008; Johnson et al., 2015). Feedback may change behavior could be because it could serve as a reinforcer or punisher, or feedback may correspond with behavior change because it functions as conditioned stimulus, discriminative stimulus, or conditioned motivating operation for the staff member (Johnson, Rocheleau, & Tilka, 2015). However, feedback may also function as a means of antecedent or consequence strategy. Previous researchers state that providing performance feedback prior to a session, observation, or opportunity to respond, could function as an antecedent to correct performance and therefore impact the effectiveness of the feedback (Alvero, Bucklin, & Austin, 2001). In this study, the researcher did provide a brief vocal statement in the morning related to when the participant would be observed during the session performance feedback phase. However, the researcher did not provide specific feedback about the participants' behavior. This statement may be something to evaluate and it

might have influenced DCS behavior for the day. If they knew they were going to receive feedback, i.e., be observed, they might have adjusted their behavior to reflect better results.

Second, as with many studies that involve direct observation, observer reactivity was prevalent in one participant. Participant 1 would say aloud during observations to clients that she was being watched and that they needed to do an activity. The researcher and RAs did their best at minimizing this reactivity by trying to blend in with the naturally occurring environment (e.g., sit and speak with other clients) or by trying to hide themselves or the data collection sheets. The vocal statement could also have impacted the reactivity of the participants' behavior. Although they did not know the exact time the researcher was watching them, they were aware their behavior was monitored that day during lunch and/or PM small group.

Although this study had both procedural/methodological and conceptual limitations, positive behavior change did occur. Appropriate staff-client interactions increased when the researcher provided session performance feedback to participants. Appropriate staff-client interactions decreased when performance feedback was thinned to either following every third or every sixth observation. However, for Participant 1, in the observation that occurred immediately after feedback was provided, appropriate staff-client interactions increased.

Future research.

Given the results obtained and limitations identified with the current study, several avenues for future research seem likely for researchers interested in further evaluating the maintenance of staff behavior changes. First, in this study, the researcher

provided one vocal statement about when the researcher would observe the participant in Phase 4. Future researchers could provide daily vocal statements in both Phase 3 and 4 or take this vocal statement component out. Second, in this study, there was no supervisor involvement. One way future researchers can get supervisors involved in the study is by training them directly on the procedures through pyramidal training (Jones et al., 1977; Page et al., 1982; Parsons & Reid, 1995; Schlosser et al., 2006). Third, in the current study, observer reactivity was an issue for one participant. Future researchers could minimize observer reactivity by video recording behaviors or by having their supervisor observe and record data as a part of their work environment.

Other manipulations and extensions future researchers could do is to provide a longer period of session performance feedback, provide a different variation of frequency of feedback, vary the type of feedback (include graphic, go from vocal and written to just written after every session), vary the frequency of feedback in the maintenance phase, provide feedback publicly in some way, teach staff how to interact with clients during specific activities, teach appropriate interactions through specific behavior plans, or teach staff how to create longer interactions. Perhaps by providing more specifics about how to increase appropriate staff-client interactions, appropriate staff-client interactions would increase and maintain over longer periods of time.

Summary and Conclusion.

The focus of this study was to evaluate the impact of different feedback frequencies on the maintenance of appropriate staff-client interactions at a facility that supports adults with IDD. DCS have multiple opportunities to interact with clients throughout the day, such as during lunchtime and group activities (e.g., art group). To

best serve the clients, it is important to focus on professional development and staff training (van Oorsouw et al., 2009). These factors also impact funding related to Medicaid Title XIX of the Social Security Act (Parsons & Reid, 1993; Zoder-Martell et al., 2014). Providers that serve clients with IDD are required to deliver appropriate active treatment and support. The purpose of active treatment is to enhance the lives of individuals with IDD by engaging them in meaningful, adaptive, and age-appropriate activities (Beadle-Brown et al., 2012; Zoder-Martell et al., 2014). Thus, staff-client interactions are important to evaluate and to increase positively and appropriately in these settings.

Several barriers exist related to effectively increasing staff-client interactions. DCS might be required to implement complicated treatment plans. A DCS who may not understand the plan may also miss opportunities to appropriately interact with clients, which can also lead to poor procedural fidelity (DiGennaro Reed & Codding, 2014; Peter Pipkin et al., 2010). Previous researchers have also discussed that education, training, and experience are not necessarily variables that influence a provider's decision to hire a person for a DCS position (Cullari and Ferguson, 1981). Over time, there has even been an increase in job expectations without concurrent adjustment in job qualifications (Crites & Howard, 2011). Another barrier to increasing and maintaining staff-client interactions is the low staff retention and high staff turnover (Hensel et al., 2015; Ingham et al., 2013; Vassos et al., 2013). If a provider focuses on better training related to increasing positive and appropriate staff-client interactions but cannot retain staff after training, then both time, money, and resources are wasted.

Previous researchers have found that feedback approaches, self-generated approaches, and reinforcement-based approaches change DCS behavior positively. This study chose to focus on the training mechanisms that has the most support (i.e., feedback approaches; Arco, 2008; Arco & Birnbrauer, 1990; Bechtel et al., 2015; Gabelica et al., 2012). The researcher provided process performance feedback on DCS behavior that included praise, correction, and information or instruction about their interactions with clients. (Arco, 2008; Arco & Birnbrauer, 1990; Bechtel et al., 2015; Gabelica et al., 2012). The researcher provided performance feedback vocally and written and delivered it immediately, frequently, and privately (Arco & Birnbrauer, 1990; Blough et al., 2006; Wood et al., 2007; van Oorsouw et al., 2009). The study incorporated both an in-service training and on-the-job coaching (session performance feedback) based on what previous researchers have deemed critical for changing DCS behavior (van Oorsouw et al. 2009). The DV (appropriate staff-client interactions) has been a variable of interest to change since the 1970s and related to staff behavior only. Researchers measured appropriate staff-client interactions using a 15-s momentary time sampling data collection system. This study expanded upon current research related to DCS and feedback interventions by evaluating different frequencies of feedback. An alternating treatments design (every third or every sixth observation) was used to evaluate what would happen to appropriate staff-client interactions once they increased with immediate, frequent feedback. A large gap in the literature exists related to the maintenance and longevity of behavior change interventions. Thus, this study represents a step in the direction of evaluating best methods of maintaining behavior change exhibited by DCS following effective staff training interventions.

REFERENCES

Aljadeff-Abergal, E., Peterson, S. M., Wiskirchen, R. R., Hagen, K. K., & Cole, M. L. (2017). Evaluating the temporal location of feedback: Providing feedback following performance vs. prior to performance. *Journal of Organizational Behavior Management, 37*(2), 171-195. doi: 10.1080/01608061.2017.1309332

Alavosius, M. P., & Sulzer-Azaroff, B. (1986). The effects of performance on the safety of client lifting and transfer. *Journal of Applied Behavior Analysis, 19*(3), 261-267. doi: 10.1901/jaba.1986.19-261

Arco, L. (1991). Effects of outcome performance feedback on maintenance of client and staff behavior in a residential setting. *Behavioral Residential Treatment, 6*(4), 231-247. doi: 10.1002/bin.2360060402

Arco, L. (2002). Using self-generated feedback for generalising and maintaining staff performance in a rehabilitation program. *Behaviour Change, 19*, 75-89. doi: 10.1375/bech.19.2.75

Arco, L. (2008). Feedback for improving staff training and performance in behavioral treatment programs. *Behavioral Interventions, 23*, 39-64. doi: 10.1002/bin.247

Arco, L., & Birnbrauer, J. S. (1990). Performance feedback and maintenance of staff behavior in residential settings. *Behavioral Residential Treatment, 5*(3), 207-217. doi: 10.1002/bin.2360060402

Arco L., & Millet, R. (1996). Maintaining instructional behavior after on-the-job training with process-based performance feedback. *Behavior Modification, 20,* 300-320. doi: 10.1177/01454455960203004

Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 1*, 91-97. doi: 10.1901/jaba.1968.1-91

Barton, E. E., Fuller, E. A., & Schnitz, A. (2016). The use of email to coach preservice early childhood teachers. *Topics in Early Childhood Special Education, 36*(2), 78-90. doi: 10.11770271121415612728

Barton, E. E., Kinder, K., Casey, A. M., & Artman, K. M. (2011). Finding your feedback fit: Strategies for designing and delivering performance feedback system. *Young Exceptional Children, 14*(1), 29-46. doi: 10.1177/1096250610395459

Barton, E. E., Pribble, L., Chen, C-I. (2013). The use of e-mail to deliver performance-based feedback to early childhood practitioners. *Journal of Early Intervention, 35*(3), 270-297. doi:10.1177/1053815114544543

Barton, E. E., & Wolery, M. (2007). Evaluation of e-mail feedback on the verbal behaviors of pre-service teachers. *Journal of Early Intervention, 30*(1), 55-72. doi: 10.1177/105381510703000105

Beadle-Brown, J., Hutchinson, A., & Whelton, B. (2012). Person-centered active support-Increasing choice, promoting independence and reducing challenging behavior. *Journal of Applied Research in Intellectual Disabilities, 25,* 291-307. doi: 10.1111/j.1468-3148.2011.00666.x

Bechtel, N. T., McGee, H. M., Huitema, B. E., & Dickinson, A. M. (2015). The effects of temporal placement of feedback on performance. *The Psychological Record, 65*(3), 425-434. doi:10.1007/s40732-015-0117-4

Blough, D., Pulliam, B., Page, T. J., Sweeney, V., Dougherty, R., & Grim, M. (2006). Improving evaluation of psychotropic medication for adults with developmental disabilities living in community settings. *Behavioral Interventions, 21,* 73-83. doi: 10.1002/bin.203

Blindert, H. D. (1975). Interactions between residents and staff: A qualitative investigation of an institutional setting for retarded children. *Mental Retardation, 13*(5), 38-40.

Bricker, W. A., Morgan, D. G., & Grabowski, J. G. (1972). Development and maintenance of a behavior modification repertoire of college attendants through t.v. feedback. *American Journal of Mental Deficiency, 77*(2), 128-136.

Brown, K. M., Willis, B. S., & Reid, D. H. (1981). Differential effects of supervisor verbal feedback and feedback plus approval on institutional staff performance. *Journal of Organizational Behavior Management, 3*(1), 57-68. doi: 10.1300/J075v03n01_05

Burch, M. R., Reiss, M. L., & Bailey, J. S. (1985). A facility-wide approach to recreation programming for adults who are severely and profoundly retarded. *Therapeutic Recreation Journal, 19*(3), 71-78.

Burg, M. M., Reid, D. H., & Lattimore, J. (1979). Use of a self-recording and supervision program to change institutional staff behavior. *Journal of Applied Behavior Analysis, 12,* 363-375. doi: 10.1901/jaba.1979.12-363

Burgio, L. D., Whitman, T. L., & Reid, D. H. (1983). A participative management approach for improving direct-care staff performance in an institutional setting. *Journal of Applied Behavior Analysis, 16*(1), 37-53. doi: 10.1901/jaba.1983.16-37

Calpin, J. P., Edlestein, B., Redmon, W. K. (1988). Performance feedback and goal-setting to improve mental health center staff productivity. *Journal of Organizational Behavior Management, 9,* 35-58. doi:10.1300/J075v09n02_04

Chan, J. S., & Yau, M. K. (2002). A study on the nature of interactions between direct-care staff and persons with developmental disabilities in institutional care. *The British Journal of Developmental Disabilities, 48,* 39-51. doi: 10.1179/096979502799104274

Coles, E., & Blunden, R. (1981). Maintaining new procedures using feedback to staff, a hierarchical reporting system, and a multidisciplinary management group. *Journal of Organizational Behavior Management, 3*(2), 19-33. doi:10.1300/J075v03n02_03

Cook, T., & Dixon, M. R. (2006). Performance feedback and probabilistic bonus contingencies among employees in a human service organization. *Journal of Organization Behavior Management, 25*(3), 45-63. doi: 10.1300/J075v25n03_04

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis*. Saddle River, NJ: Pearson Publishing.

Courtemanche, A., Sheldon, J., Sherman, J., Schroeder, S., Bell, A., & House, R. (2014). Assessing the effects of a staff training package on the treatment integrity of an intervention for self-injurious behavior. *Journal of Developmental & Physical Disabilities,* 26(4). 371-389. doi: 10.1007/s10882-014-9372-6

Cox, A. D., Dube, C., and Temple, B. (2015). The influence of staff training on challenging behaviour in individuals with intellectual disability: A review. *Journal of Intellectual Disabilities, 19*(1), 69-82. doi: 10.1177/1744629514558075

Crites, S. A., & Howard, B. H. (2011). Implementation of systematic instruction to increase client engagement in a day habilitation program. *Journal of Intellectual & Developmental Disability, 36*(1), 2-10. doi:10.3109/13668250.2010.541428

Cullari, S., & Ferguson, D. G. (1981). Individual behavior change: Problems with programming in institutions for mentally retarded persons. *Mental Retardation, 19*(6), 267-270.

DiGennaro Reed, F. D., & Codding, R. S. (2014). Advancements in procedural fidelity assessment and intervention: Introduction to the special issue. *Journal of Behavioral Education, 23*, 1-18. doi:10.1007/s10864-013-9191-3

Doerner, M., Miltenberger, R. G., & Bakken, J. (1989). The effects of staff self-management on positive social interactions in a group home setting. *Behavioral Residential Treatment, 4*(4), 313-330. doi: 10.1002/bin.2360040404

Embregts, P. J. C. M., (2003). Using self-management, video feedback, and graphic feedback to improve social behavior of youth with mild mental retardation. *Division on Autism and Developmental Disabilities, 38*(3), 283-295.

Finn, L. L., & Sturmey, P. (2009). The effect of peer-to-peer training on staff interactions with adults with dual diagnoses. *Research in Developmental Disabilities, 30*, 96-106. doi:10.1016/j.ridd.2007.11.004

Fleming, R. K., & Sulzer-Azaroff, B. (1989). Enhancing quality of teaching by direct care staff through performance feedback on the job. *Behavioral Interventions, 4*(4), 377-395. doi: 10.1002/bin.2360040407

Fox, C. J., & Sulzer-Azaroff, B. (1990). The effectiveness of two different sources of feedback on staff teaching of fire evacuation skills. *Journal of Organizational Behavior Management, 10*(2), 19-36. doi: 10.1300/J075v10n02 03

Gabelica, C., Van den Bossche, P., Segers, M., & Gijselaers, W. (2012). Feedback, a powerful lever in teams: A review. *Educational Research Review, 7*(2), 123-144. doi: 10.1016/j.edurev.2011.11.003

Gardner, J. M., & Giampa, F. L. (1971). The attendant behavior checklist: Measuring on-the-ward behavior of institutional attendants. *American Journal of Mental Deficiency, 75*(5), 617-622.

Gil, P. J., & Carter, S. L. (2016). Graphic feedback, performance feedback, and goal setting increased staff compliance with a data collection task at a large residential facility. *Journal of Organizational Behavior Management, 36*(1), 56-70. doi:10.1080/01608061.2016.1152207

Green, C. W., Parsons, M. B., & Reid, D. H. (1993). Integrating instructional procedures into traditional congregate care situations for people with severe disabilities. *Behavioral Residential Treatment, 8*(4), 243-262. doi: 10.1002/bin.2360080404

Green, C. W., Rollyson, J. H., Passante, S. C., & Reid, D. H. (2002). Maintaining proficient supervisor performance with direct support personnel: An analysis of two management approaches. *Journal of Applied Behavior Analysis, 35*(2), 205-208. doi: 10.1901/jaba.200.35-205

Greene, B. F., Willis, B. S., Levy, R., & Bailey, J. S. (1978). Measuring client gains from staff-implemented programs. *Journal of Applied Behavior Analysis, 11*(3), 395-412. doi: 10.1901/jaba.1978.11-395

Guercio, J. M., & Dixon, M. R. (2010). Improving the quality of staff and participant interaction in an acquired brain injury organization. *Journal of Organizational Behavior Management, 30*(1), 49-56. doi: 10.1080/01608060903529780

Guercio, J. M., Dixon, M. R., Soldner, J., Shoemaker, Z., Zlomke, K., Root, S. & Small, S. (2005). Enhancing staff performance measures in an acquired brain injury setting: Combining the habituation to organizational behavioral interventions. *Behavioral Interventions, 20*, 91-99. doi: 10.1002/bin.174

Hallahan, D. P., Kauffman, J. M., & Pullen, P. C. (2015). *Exceptional learners: An introduction to special education (13th Ed)*. New Jersey: Pearson Education, Inc.

Harchik, A. E., Anderson, M., Thomson, R., Forde, K., Feinberg, L., Rivest, S., & Luiselli, J. K. (2001). Evaluation of a participatory competency-based model of staff training in a community habilitative setting. *Behavioral Interventions, 16*, 1-13.

Harchik, A. E., Sherman, J. A., Sheldon, J. B., & Strouse, M. C. (1992). Ongoing consultation as a method of improving performance of staff members in a group home. *Journal of Applied Behavior Analysis, 25*(3), 599-610. doi: 10.1901/jaba.1992.25-599

Hensel, J. M., Lunsky, Y., Dewa, C. S. (2015). Exposure to aggressive behaviour and burnout in direct support providers: The role of positive work factors. *Research in Developmental Disabilities, 36*, 404-412. doi: 10.1016/j.ridd.2014.10.033

Hollander, M., Plutchik, R., & Horner, V. (1973). Interaction of patient and attendant reinforcement programs: The "piggyback effect." *Journal of Consulting and Clinical Psychology, 41*(1), 43-47. doi: 10.1037/h0035627

Hutchison, A., & Kroese, B. S. (2015). Making sense of varying standards of care: The experiences of staff working in residential care environments for adults with learning disabilities. *British Journal of Learning Disabilities, 44*, 182-193. Doi: 10.111/bld.12136

Hrydowy, E. R., & Martin, G. L. (1994). A practical staff management package for use in a training program for persons with developmental disabilities. *Behavior Modification, 18*, 66-88. doi: 10.1177/01454455940181005

Ingham, B., Riley, Nevin, H., Evans, G., Gair, E. (2013). An initial evaluation of direct care staff resilience workshops in intellectual disabilities services. *Journal of Intellectual Disabilities, 17*(3), 214.222. doi: 10.1177/1744629513494642

Ingersoll, B., & Wainer, A. (2013). Initial efficacy of project ImPACT: A parent-mediated social communication intervention for young children with ASD. *Journal of Autism and Developmental Disorders, 43*(12), 2943-2952. doi:10.1007/s10803-013-1840-9

Ivancic, M. T., Reid, D. H., Iwata, B. A., Faw, G. D., & Page, T. J. (1981). Evaluating a supervision program for developing and maintaining therapeutic staff-resident interactions during institutional care routines. *Journal of Applied Behavior Analysis, 14*(1), 95-107. doi: 10.1901/jaba.1981.14-95

Iwata, B. A., Bailey, J. S., Brown, K. M., Foshee, T. J., & Alpern, M. (1976). A performance-based lottery to improve residential care and training by institutional

staff. *Journal of Applied Behavior Analysis, 9*(4), 417-431. doi: 10.1901/jaba.1976.9-417

Jensen, C., C., Watson, L. S., DeWulf, M. J., Johnson, S. P., Davis, N. S., Sottolano, D. C. (1992). Normalization of mealtimes for persons with developmental disabilities: Implementation by professional and direct-care staff. *Behavioral Residential Treatment, 7*(5), 355-371. doi: 10.1002/bin.2360070504

Jerome, J., Kaplam, H., & Sturmey, P. (2014). The effects of in-service training alone and in-service training with feedback on data collection accuracy for direct-care staff working with individuals with intellectual disabilities. *Research in Developmental Disabilities, 35*, 529-536. doi: 10.1016/j.ridd.2013.11009

Johnson, D. A., Rocheleau, J. M., & Tilka, R. E. (2015). Considerations in feedback delivery: The role of accuracy and type of evaluation. *Journal of Organizational Behavior Management, 35*(3-4), 240-258. Doi:10.1080/01608061.2015.1093055

Jones, F. H., Fremouw, W., & Carples, S. (1977). Pyramid training of elementary school teachers to use a classroom management skills package. *Journal of Applied Behavior Analysis, 10*, 239-253. doi: 10.1901/jaba.1977.10-239

Kazdin, A. E. (2011). *Single-case research designs: Methods for clinical and applied settings* (2nd ed). New York, NY: Oxford University Press.

Kissel, R. C., Whitman, T. L., & Reid, D. H. (1983). An institutional staff training and self-management program for developing multiple self-care skills in severely/profoundly retarded individuals. *Journal of Applied Behavior Analysis, 16*(4), 395-415. doi:10.1901/jaba.1983.16-395

Kneringer, M. J., & Page, T. J. (1999). Improving staff nutritional practices in community-based group homes: Evaluation, training, and management. *Journal of Applied Behavior Analysis, 32*(2), 221-224. doi: 10.1901/jaba.1999.32-221

Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). Single-case designs technical documentation. Retrieved from What Works Clearinghouse website: http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf

Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2013). Single-case intervention research design standards. *Remedial and Special Education, 34*, 26-38. doi: 10.1177/0741932512452794

Matthews, K., & Hagopian, L. (2014). A comparison of two data analysis training methods for paraprofessionals in an educational setting. *Journal of Organizational Behavior Management, 34*(2), 165-178. doi:10.1080/01608061.2014.912974

Mayer, G. R., Sulzer-Azaroff, B., & Wallace, M. (2014). Behavior analysis for lasting change (3rd ed.). Cornwall-on-Hudson: Sloan Publishing.

Moher, D., Liberati, A., Tetzlaff, J., Altman, DG., The PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Med, 6*(7): e1000097. doi: 10.1371/journalpmed1000097

Morris, J., & Ellis, J. (1997). The effect of verbal and graphic feedback on the data-recording behavior of direct care trainers. *Behavioral Interventions, 12*(2), 77-104. doi: 10.1002/(SICI)1099-078X(199704)12:2<77::AID-BIN169>3.0CO;2-U

Mowery, J. M., Miltenberger, R. G., & Weil, T. M., (2010). Evaluating the effects of reactivity to supervisor presence on staff response to tactile prompts and self-monitoring in a group home setting. *Behavioral Interventions, 25*, 21-35. doi:10.1002/bin.296

Mozingo, D. B. Smith, T., Riordan, M. R., Reiss, M. L., & Bailey, J. S. (2006). Enhancing frequency recording by developmental disabilities treatment staff. *Journal of Applied Behavior Analysis, 39*, 253-256. doi: 10.1901/jaba.2006.55-05

Nordstrom, R., Lorenzi, P., & Hall, V (1991). A review of public posting of performance feedback in work settings. *Journal of Organizational Behavior Management, 11*(2), 101-124. doi: 10.1300/J075v11n02_07

Nosik, M. R., Williams, W. L., Garrido, N., & Lee, S. (2013). Comparison of computer based instruction to behavior skills training for teaching staff implementation of discrete-trial instruction with an adult with autism. *Research in Developmental Disabilities, 34*, 461-468. doi:10.1016/j.ridd.2012.08.011

Outar, C., & Rose, J. (2017). Is there a relationship between role identify, work demands, and burnout in direct care staff working with individuals with intellectual disability? *Journal of Intellectual and Developmental Disability, 42*(2), 123-130. doi:;10.3109/13668250.2016.1211257

Panyan, M., Boozer, H., & Morris, N. (1970). Feedback to attendants as a reinforcer for applying operant techniques. *Journal of Applied Behavior Analysis, 3*(1), 1-4. doi: 10.1019/jaba.1970.3-1

Patterson, F. T., Griffin, J. C., & Panyan, M. C. (1976). Incentive maintenance of self-help skill training programs for non-professional personnel. *Journal of Behavior*

Therapy and Experimental Psychiatry, 7, 249-253. doi: 10.1016/0005-7916(76)90008-2

Parsons, M. B., & Reid, D. H. (1995). Training residential supervisors to provide feedback for maintaining staff teaching skills with people who have severe disabilities. *Journal of Applied Behavior Analysis, 39*, 317-322. doi: 10.1901/jaba.1995.28-317

Parsons, M. B., Reid, D. H.. & Green, C. W. (1993). Preparing direct service staff to teach people with severe disabilities: A comprehensive evaluation of an effective and acceptable training program. *Behavioral Residential Treatment, 8*(3), 163-185. doi: 10.1002/bin.2360080302

Parsons, M. B., Rollyson, J. H., & Reid, D. H. (2013). Teaching practitioners to conduct behavioral skills training: A pyramidal approach for training multiple human service staff. *Behavior Analysis in Practice, 6*(2), 4-16.

Pommer, D. A., & Streedbeck, D. (1974). Motivating staff performance in an operant learning program for children. *Journal of Applied Behavior Analysis, 7*(2), 217-221. doi: 10.1901/jaba.1974.7-217

Prue, D. M., Krapfl, J. E., Noah, J. C., Cannon, S., & Maley, R. F. (1980). Managing the treatment activities of state hospital staff. *Journal of Organizational Behavior Management, 2*(3), 165-181. doi: 10.1300/J075v02n03_03

Realon, R. E., Wheeler, A. J., Spring, B., & Spinger, M. (1986). Evaluating the quality of training delivered by direct-care staff in a state mental retardation center. *Behavioral Residential Treatment, 1*(3), 199-212. doi: 10.1002/bin.2360010305

Rice, D. M., & Rosen, M. (1991). Direct-care staff: A neglected priority. *Mental Retardation, 29*(4), iii.

Reid, D. H. (2004). Training and supervising direct support personnel to carry out behavioral procedures. In J. L. Matson, R. B. Laud, & M. L. Matson (Eds.), Behavior modification for persons with developmental disabilities: treatments and supports (pp. 73–99). Kingston: National Association for the Dually Diagnosed.

Reid, D. H., Parsons, M. B., & Green, C. W. (1989). *Staff management in human services.* Springfield: Charles C. Thomas.

Richman, G. S., Riodan, M. R., Reiss, M. L., Pyles, D. A. M., & Bailey, J. S. (1988). The effects of self-monitoring and supervisor feedback on staff performance in a residential setting. *Journal of Applied Behavior Analysis, 21*(4), 401-409. doi: 10.1901/jaba.1988.21-401

Roscoe, E. M., Fisher, W. W., Glover, A. C., & Volkert, V. M. (2006). Evaluating the relative effects on feedback and contingent money for staff training of stimulus preference assessments. *Journal of Applied Behavior Analysis, 39*(1), 63-77. doi: 10.1901/jaba.2006.7-05

Schepis, M. M., & Reid, D. H. (1994). Training direct service staff in congregate settings to interact with people with severe disabilities: A quick, effective and acceptable program. *Behavioral Interventions, 9*(1), 13-26. doi: 10.1002/bin.2360090103

Seys, D. M., & Duker, P. C. (1986). Effects of a supervisory treatment package on staff-mentally retarded resident interactions. *American Journal of Mental Deficiency, 90*(4), 388-394.

Shapiro, M., & Kazemi, E. (2017). A review of training strategies to teach individuals implementation of behavioral interventions. *Journal of Organizational Behavior Management, 37*(1), 32-62. doi:10.1080/01608061.2016.1297066

Shoemaker, J., & Reid, D. H. (1980). Decreasing chronic absenteeism among institutional staff. *Journal of Organizational Behavior Management, 2*(4), 317-328. doi: 10.1300/J075v02n04_07

Sigafoos, J., Roberts, D., Couzens, D., & Caycho, L. (1992). Improving instruction for adults with developmental disabilities: Evaluation of a staff training package. *Behavioral Residential Treatment, 7*(4), 283-297. doi: 10.1002/bin.2360070404

Sigurdsson, S. O., & Austin, J. (2006). Institutionalization and response maintenance in organizational behavior management. *Journal of Organizational Behavior Management, 26*, 41–75.

Smidt, A., Balandin, S., Reed, V., & Sigafoos, J. (2007). A communication training programme for residential staff working with adults with challenging behaviour: Pilot data on intervention effects. *Journal of Applied Research in Intellectual Disabilities, 20,* 16-29. doi: 10.1111/j.1468-3168-3148.2006.00336.x

Smith, D. M. (1995). A system of program evaluation and the use of feedback as a means of improving service delivery. *Behavioral Intervention, 10*(4), 225-236. doi: 10.1002/bin.2360100405

Spreat, S., Piper, T., Deaton, S., Savoy-Paff, D., Brantner, J., Lipinski, D., Dorsey, M., & Baker-Potts, J. C. (1985). The impact of supervisory feedback on staff and client behavior. *Education and Training of the Mentally Retarded*, *20*,(3), 196-203.

St. Peter Pipkin, C., Vollmer, T. R., & Sloman, K. N. (2010). Effects of treatment integrity failures during differential reinforcement of alternative behavior: A translational model. *Journal of Applied Behavior Analysis, 43*(1), 47-70. doi: 10.1901/jaba.2010.43-47

Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis, 10,* 349-367. doi: 10.1901/jaba.1977.10-349

Suda, K. T., & Miltenberger, R. G. (1993). Evaluation of staff management strategies to increase positive interactions in a vocational setting. *Behavioral Residential Treatment, 8*(2), 69-88. doi: 10.1002/bin.2360080202

Totsika, V., Toogood, S., Hastings, R. P., & McCarthy, J. (2010). The effect of active support interactive training on the daily lives of adults with an intellectual disability. *Journal of Applied Research in Intellectual Disabilities, 23,* 112-121. doi: 10.1111/j.1468-3148.2009.00510.x

Towery, D., Parsons, M. B., & Reid, D. H. (2014). Increasing independence within adult services: A program for reducing staff completion of daily routines for consumers with developmental disabilities. *Behavior Analysis in Practice, 7,* 61-69. doi:10.1007/s40617-014-0013-4

van der Meer, L., Matthews, T., Ogilvie, E., Berry, A., Waddington, H., Balandin, S.,… Sigafoos, J. (2017). Training direct-care staff to provide communication intervention to adults with intellectual disability: A systematic review. *American Journal of Speech-Language Pathology, 26,* 1279-1295. doi: 10.1044/2017_AJSLP-16-0125

van Oorsouw, W. M. W. J., Embregts, P. J. C. M., Bosman, A. M. T., & Jahoda, A. (2009). Training staff serving clients with intellectual disabilities: A meta-analysis of aspects determining effectiveness. *Research in Developmental Disabilities, 30,* 503-511. doi: 10.1016/j.ridd.2008.07.011

Vassos, M., Nankervis, K., Skerry, T., Lante, K. (2013). Work engagement and job burnout within the disability support population. *Research in Developmental Disabilities, 34*, 3884-3895. doi:10.1016/j.ridd.2013.08.005

Wang, H. (2017). Utilizing primary tier intervention to enhance reciprocal turn-taking of children with autism in Taiwan. *Education and Training in Autism and Developmental Disabilities*, *52*(1), 64-76.

What Works Clearinghouse. (2017). *Procedures handbook* (Version 4.0). Retrieved from https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_procedures_handbook_v4.pdf

What Works Clearinghouse. (2017). *Reviewer guidance for use with the procedures handbook* (Version 4.0). Retrieved from https://ies.ed.gov/ncee/wwc/Docs/ReferenceResources/wwc_reviewer_guidance_103017.pdf

What Works Clearinghouse. (2017). *Standards handbook* (Version 4.0). Retrieved from https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_standards_handbook_v4.pdf

Wilson, P. G., Reid, D. H., & Korabek-Pinkowski, C. A. (1991). Analysis of public verbal feedback as a staff management procedure. *Behavioral Residential Treatment, 6*(4), 263-277. doi: 10.1002/bin.2360060404

Wolf, M. M. (1978). Social validity, the case for subjective measurement of how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis, 11*, 203-214. doi: 10.1901/jaba.1978.11-203

Wood, A. L., Luiselli, J. K., & Harchik, A. E. (2007). Training instructional skills with paraprofessional service providers at a community-based habilitation setting. *Behavior Modification, 31*(6), 847-855. doi: 10.1177/0145445507302893

Zimmerman, K. N., & Ledford, J. R. (2017). Beyond ASD: Evidence for the effectiveness of social narratives. *Journal of Early Intervention, 39*(3), 199-217. doi: 10.1177/1053815117709000

Zimmerman, K. N., Ledford, J. R., Severini, K. E., Putejovsky, J. E., Barton, E. E., & Lloyd, B. P. (2018). Single-case synthesis tools I: Comparing tools to evaluate SCD quality and rigor. *Research in Developmental Disabilities, 79*, 19-32. doi: 10.1016/j.ridd.2018.02.003

Zimmerman, K. N., Putejovsky, J. E., Ledford, J. R., Barton, E. E., Severini, K. E., & Lloyd, B. P. (2018). Single-case synthesis tools II: Comparing quantitative outcome measures. *Research in Developmental Disabilities, 79*, 65-76. doi: 10.1016/j.ridd.2018.02.001

Zoder-Martell, K. A., Dufrene, B. A., Tingstrom, D. H., Olmi, D. J., Jordan, S. S., Biskie, E. M., & Sherman, J. C. (2014). Training direct care staff to increase positive interactions with individuals with developmental disabilities. *Research in Developmental Disabilities, 35*, 2180-2189. doi: 10.1016/j.ridd.2014.05.016

Table 1. *Study Characteristics.*

Author(s)/ Year	Intervention Type	Design	Data Collection	Mastery Criterion	Social Validity	Generalization	Maintenance
Cook & Dixon (2006)	R-R	MBL	TA	NR	NR	NR	NR
Courtemanche et al. (2014)	R-R	MBL	TA	Yes	Yes	NR	NR
Fleming & Sulzer-Azaroff (1989)	FB-R	MBL	TA	NR	NR	NR	Yes
Fox & Sulzer-Azaroff (1990)	FB-S	MBL	TA	NR	Yes	NR	NR
Gil & Carter (2016)	FB-S	MBL	TA	NR	NR	NR	Yes
Green et al. (1993)	FB-R	MP	TS	NR	NR	NR	NR
Green et al. (2002)	FB-R&S	MP	TA	Yes	NR	NR	NR
Guercio & Dixon (2010)	FB-R	MBL	TS	NR	NR	NR	NR
Harchik et al. (1992)	FB-R	Reversal	TA, TS	NR	Yes	NR	NR

(continued)

Table 1. *Study Characteristics (continued).*

Author(s)/ Year	Intervention Type	Design	Data Collection	Mastery Criterion	Social Validity	Generalization	Maintenance
Hrydowy & Martin (1994)	FB-S	MBL	TA, TS	NR	Yes	Yes	Yes
Kneringer & Page (1999)	FB-S	MBL	TA	NR	Yes	NR	Yes
Morris & Ellis (1997)	SMO- R	MBL	Count	NR	NR	NR	NR
Mowery et al. (2010)	SMA-S	MBLw/ATD	TS	NR	Yes	NR	NR
Parsons & Reid (1995)	FB-S	MP	TA	Yes	Yes	NR	NR
Parsons et al. (1993)	FB-R	Group	Pre/Post	Yes	Yes	NR	NR
Parsons et al. (2013)	FB-R	MP	TA	NR	Yes	NR	NR
Roscoe et al. (2006)	R-R	MBL	TA	Yes	NR	NR	NR
Schepis & Reid (1994)	FB-R	MP	TS	NR	Yes	NR	NR
Schlosser et al. (2006)	FB-S	MP	Rate	NR	NR	NR	NR
Sigafoos et al. (1992)	SMO-R	MBL	TS	NR	Yes	Yes	Yes
Smidt et al. (2007)	FB-R	MP	Rate	NR	Yes	NR	NR
Smith (1995)	FB-B	MBL	TA	NR	NR	NR	NR

(continued)

Table 1. *Study Characteristics (continued).*

Author(s)/ Year	Intervention Type	Design	Data Collection	Mastery Criterion	Social Validity	Generalization	Maintenance
Suda & Miltenberger (1993)	SMA-B	MBL	TS	Yes	Yes	Yes	Yes
Towery et al. (2014)	FB-R	MP	TA	NR	Yes	NR	NR
Wood et al. (2007)	FB-R	MBL	TA	NR	NR	NR	NR
Wilson et al. (1991)	FB-S	MBL	TS	NR	NR	Yes	Yes
Zoder-Martell et al. (2014)	FB-R	MBL	Rate	NR	NR	NR	Yes

Note. FB = feedback, - R= feedback by researcher, -S= feedback by supervisor, -B= feedback by both researcher and supervisor, MBL= multiple baseline, MP= multiple probe, R= reinforcement, SMA= self-management, SMO= self-monitoring, TA= task analysis, TS= time sampling, NR= not reported

Table 2. *Demographics of Participants in Studies on Performance Feedback Approaches.*

Study Type	Author(s) and Year	Age	Sex	Education	Experience	Total number of participants
FB: V, W, I, Pv	Fleming & Sulzer-Azaroff (1989)	28-50 years	4f/0m	NR	less than 1 year-several years	4
FB: W, I, Pv, NonS	Fox & Sulzer-Azaroff (1990)	21-58 years	13f/15m	NR	NR	28
FB: V, G, Pub	Gil & Carter (2016)	18+ years	NR	> HSD	NR	NR
FB: V, W, I, Pv	Green et al. (1993)	20-41 years	6f/1m	HSD	1-4 years	7
FB: W, Vid, I, Pv	Guercio & Dixon (2010)	NR	NR	NR	less than 1 year	3
FB: V, I, Pv	Harchik et al. (1992)	20-30s years	NR	HSD-CD	NR	9
FB: V, W, I, Pv	Hrydowy & Martin (1994)	NR	3f/0m	>HSD-HSD	10-19 years	3
FB: V, G, I, Pub	Kneringer & Page (1999)	NR	NR	CD	1 month-3.5 years	10
FB: V, I, Pv	Parsons et al. (1993)	31-60 years	NR	>HSD-CD	NR	46 (4 supervisors)
FB: V, I, Pv	Parsons et al. (2013)	31-57 years	7f/3m	>HSD-GD	2-31 years	10
FB: V, D, Pv	Schepis & Reid (1994)	18-51 years	9f/0m	>HSD-HSD	8 days-6 months	9
FB: V, Pv	Smidt et al. (2007)	NR	16f/2m	NR	Weeks-30+ years	18

(continued)

Table 2. *Demographics of Participants in Studies on Performance Feedback Approaches (continued).*

Study Type	Author(s) and Year	Age	Sex	Education	Experience	Total number of participants
FB: V, Pv, NonS	Smith (1995)	average age 23 years	1f/3m	>CD	average 7 months	4
FB: V, I, Pub	Towery et al. (2014)	NR	NR	HSD-CD	15-18 years	6
FB: V, I, Pub	Wilson et al. (1991)	19-60 years	NR	>HSD- >CD	0-95 months	11
FB: V, I, Pub	Wood et al. (2007)	early 20s-late 40s	0f/4m	HSD	0-10 years	4
FB: V, I, Pv	Zoder-Martell et al. (2014)	NR	4f/0m	NR	3-13 years	4
	Summary	**18-60 years**	**63f/28m**	**>HSD-GD**	**0-30+ years**	**176**

Note. CD= college degree, G= graphic, GD= graduate degree, HSD= high school degree, I= immediate, FB= feedback, NonS= nonsupervisory, NR= not reported, Pub= public, Pv= private, V= vocal, and W= written.

Table 3. *Demographics of Participants in Studies on Self-Generated Feedback Approaches.*

Study Type	Author(s) and Year	Age	Sex	Education	Experience	Total number of participants
Self-Monitoring	Morris & Ellis (1997)	NR	6f/6m	NR	NR	12
Self-Management	Mowery et al. (2010)	21-33 years	3f/1m	HSD-CD	10 months-3 years	4
Self-Monitoring	Sigafoos et al. (1992)	23-41 years	3f/0m	NR	3 months- 4 years	3
Self-Management	Suda & Miltenberger (1993)	21-32 years	3f/1m	HSD	6 months- 5 years	4 (1 supervisor)
	Summary	**21-64 years**	**28f/ 12m**	**HSD- GD**	**1 month-20 years**	**40**

Note. CD= college degree, GD= graduate degree, HSD= high school degree, and NR= not reported.

Table 4. *Demographics of Participants in Studies on Reinforcement-Based Approaches.*

Study Type	Author(s) and Year	Age	Sex	Education	Experience	Total number of DCS participants
Reinforcement	Cook & Dixon (2006)	28-40 years	NR	NR	NR	3 supervisors
Reinforcement	Courtemanche et al. (2014)	42-54 years	NR	HSD- CD	10 months- 3 years	2 & 1 para
Reinforcement	Roscoe et al. (2006)	NR	NR	NR	NR	4
	Summary	**28-54 years**	**NR**	**HSD- CD**	**10 months-3 years**	**10**

Note. CD= college degree, GD= graduate degree, HSD= high school degree, and NR= not reported

Table 5. *Articles published prior to 1989.*

Author(s)	Year	Intervention Type
Alavosius & Sulzer-Azaroff	1986	FB
Bricker et al.	1972	R
Brown, Willis, & Reid	1981	FB
Burg et al.	1979	SM
Burgio et al.	1983	SM
Burch et al.	1985	FB
Calpin et al.	1988	SM
Coles & Blunden	1981	FB
Greene et al.	1978	FB
Hollander et al.	1973	R
Ivancic et al.	1981	FB
Iwata et al.	1976	R

Continued.

Table 5. *Articles published prior to 1989. (Continued).*

Author(s)	Year	Intervention Type
Kissel et al.	1983	SM
Panyan et al.	1970	FB
Patterson et al.	1976	R
Pommer & Streedbeck	1974	R
Prue et al.	1980	FB
Realon et al.	1986	R
Seys, & Duker	1986	SM
Shoemaker & Reid	1980	R
Spreat et al.	1985	FB

Note. FB= Feedback, SM= Self-monitoring/self-management, R= Reinforcement.

Table 6. *Articles published in the past 30 years excluded from the literature review.*

Author(s)	Year	Intervention Type
Arco	1991	FB
Blough et al.	2006	FB
Doerner et al.	1989	SG
Embregts	2003	FB
Guercio et al.	2005	FB
Jensen et al.	1992	FB
Mozingo et al.	2006	FB
Richman et al.	1988	SG

Note. FB= Feedback, SG= Self-Generated.

Table 7. *Demographics of DCS.*

Participant	Position	Age	Sex	Highest Completed Education	Years of Experience Working with Individuals with IDD
1	DCS	62	Female	High School	27
2	DCS	30	Female	Associate	3
3	DCS	NR	Female	NR	NR
4	DCS	56	Female	High School	13
5	DCS	29	Female	High School	6

Note. NR= Not Reported.

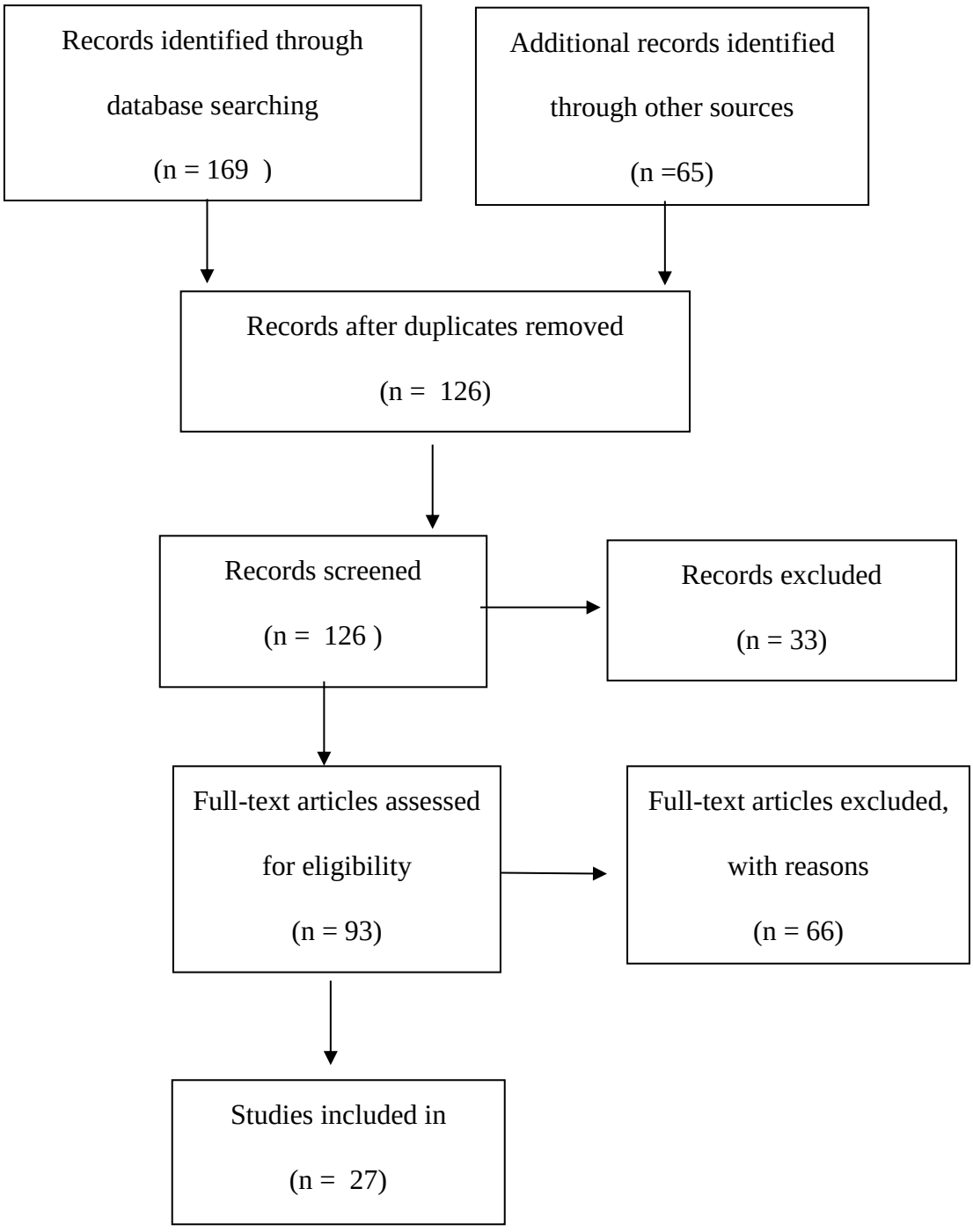

Figure 1. Literature Review Search.

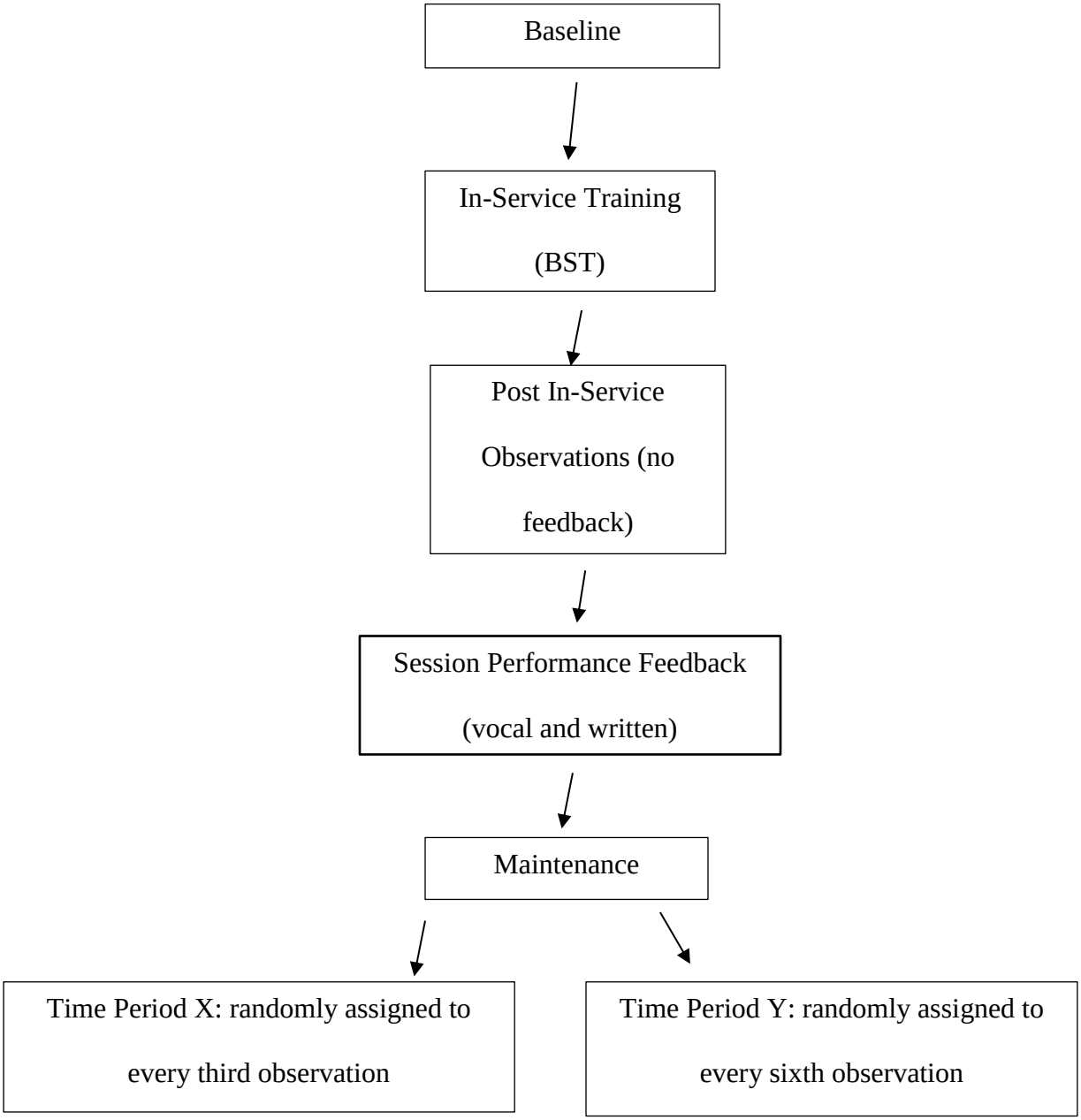

Figure 2. Steps of Experiment.

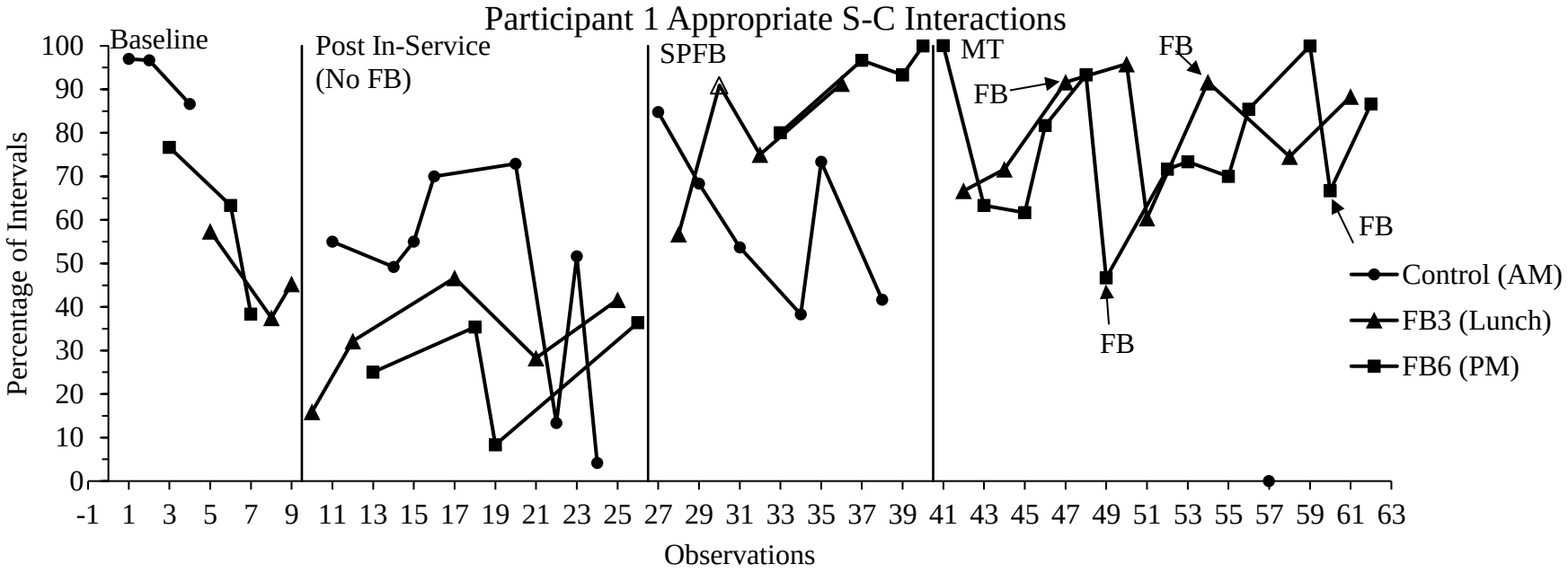

Figure 3. Participant 1 Appropriate Staff-Client Interactions. The open triangle (44) is the first observation following feedback.

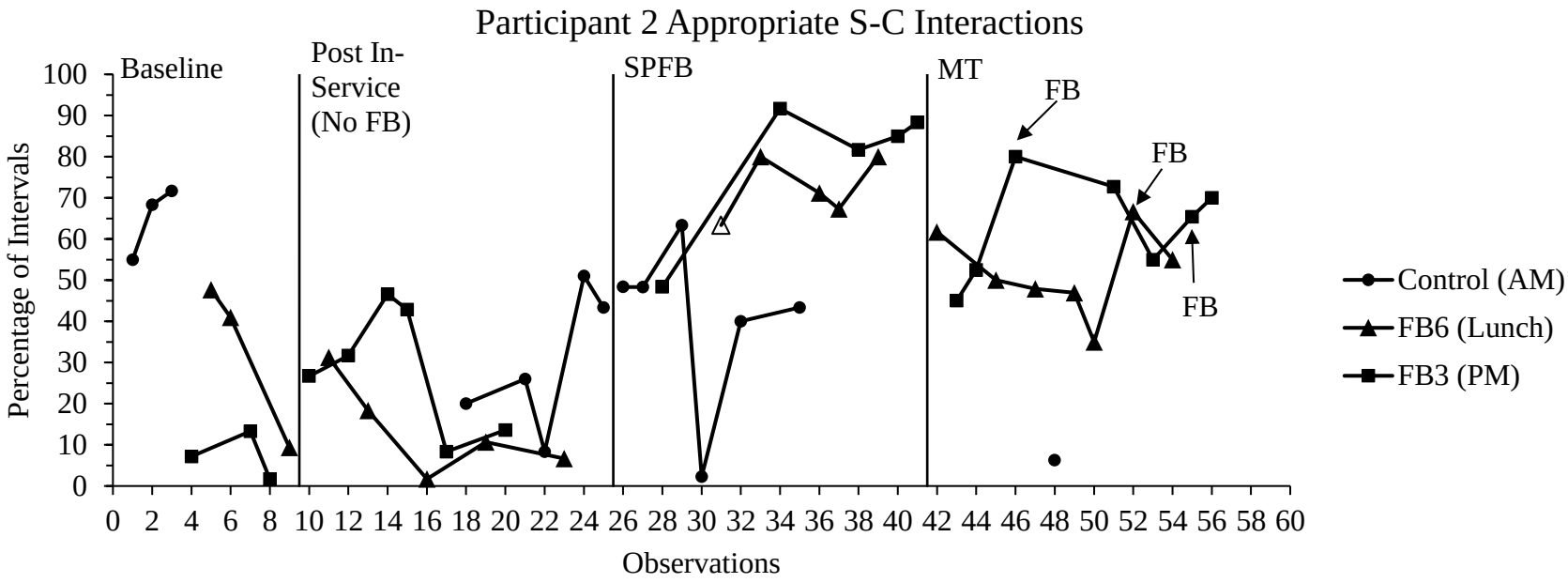

Figure 4. Participant 2 Appropriate Staff-Client Interactions. The open triangle (31) is the first observation following feedback.

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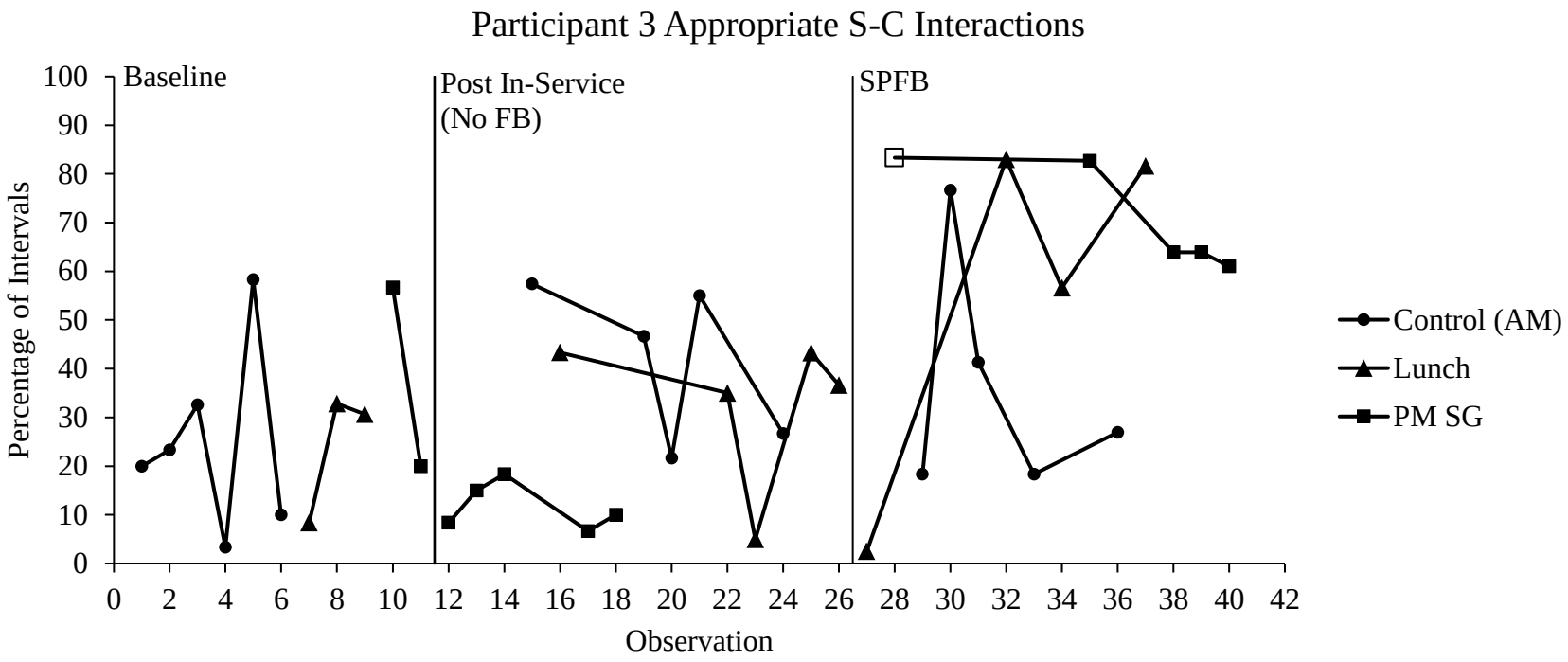

Figure 5. Participant 3 Appropriate Staff-Client Interactions. The open square (28) is the first observation following feedback.

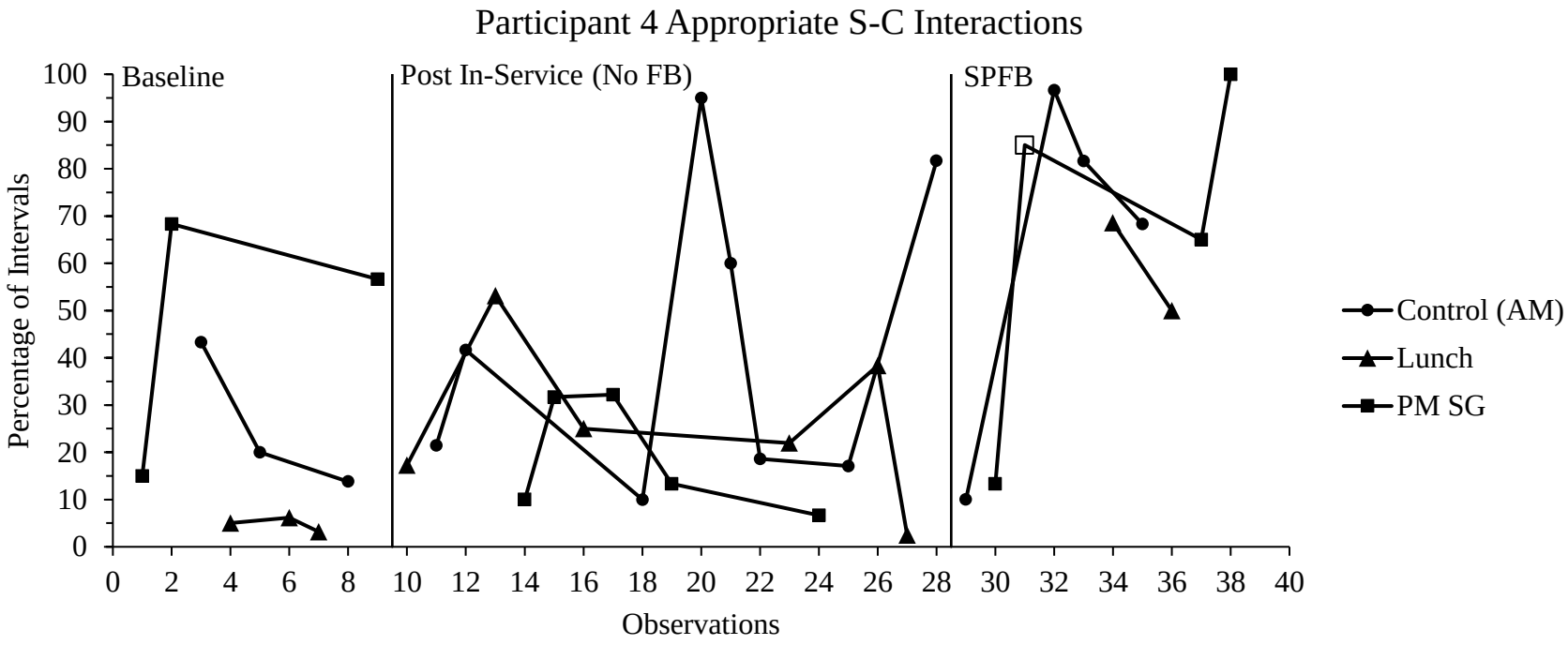

Figure 6. Participant 4 Appropriate Staff-Client Interactions. The open square (31) is the first observation following feedback.

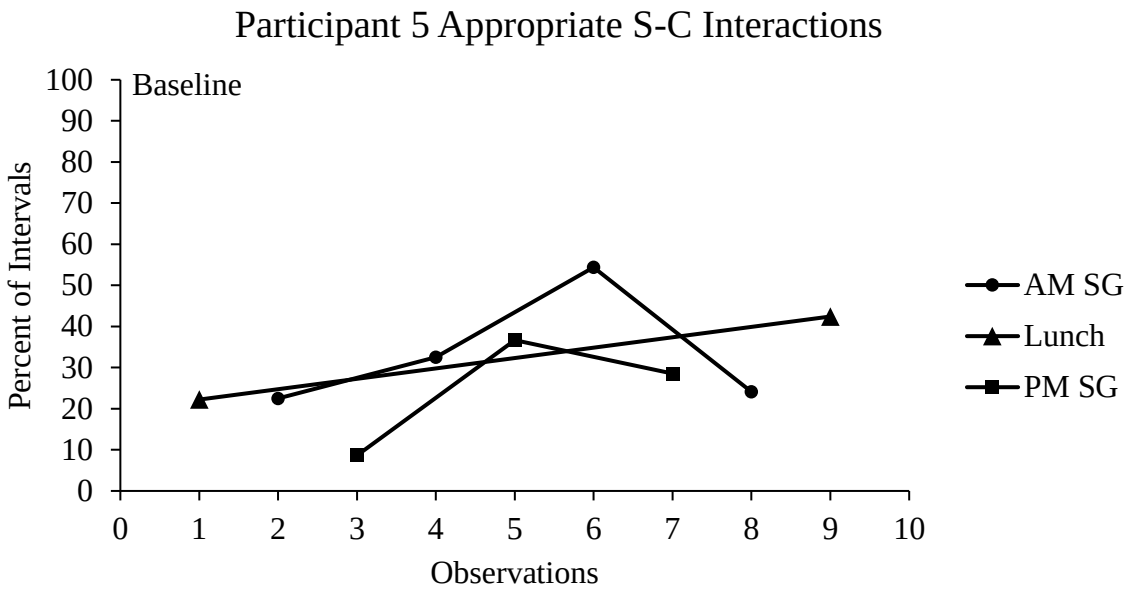

Figure 7. Participant 5 Appropriate Staff-Client Interactions.

Appendices

Appendix A

MTS Data Sheet

Date: _____Data collector initials: _____ Activity(s):_____

Time Observed: _____Staff observed initials:_____

+= Appropriate, - = Inappropriate, 0= No Interaction BL TX(no FB)

TX(FB) MT

Time	**Staff-Client**	**Time**	**Staff-Client**	**Time**	**Staff-Client**	**Time**	**Staff-Client**
15s		4 min 15s		8 min 15s		12 min 15s	
30s		4 min 30s		8 min 30s		12 min 30s	
45s		4 min 45s		8 min 45s		12 min 45s	
1 min		5 min		9 min		13 min	
1 min 15s		5 min 15s		9 min 15s		13 min 15s	
1 min 30 s		5 min 30s		9 min 30 s		13 min 30s	
1 min 45s		5 min 45s		9 min 45s		13 min 45s	
2 min		6 min		10 min		14 min	
2 min 15s		6 min 15s		10 min 15s		14 min 15s	
2 min 30 s		6 min 30 s		10 min 30s		14 min 30s	
2 min 45s		6 min 45s		10 min 45s		14 min 45s	
3 min		7 min		11 min		15 min	
3 min 15s		7 min 15s		11 min 15s		15 min 15s	
3 min 30s		7 min 30 s		11 min 30s		15 min 30s	

3 min 45s		7 min 45s		11 min 45s		15 min 45s	
4 min		8 min		12 min		16 min	

Appendix B

Procedural Fidelity Forms

Baseline PF Checklist

Date: _____

Data collector's initials: _____

Staff Initials: _____

Activity _____

Did not provide feedback _____

In-Service Training PF Checklist

Date: _____

Data collector's initials: _____

Staff Initials: _____

Activity _____

Reviewed instructions: _____

Modeled two scenarios: _____

Followed scripts for modeling: _____

Provided 10 or more opportunities for interactions: _____

Provided feedback to staff (when applicable): _____

Post In-Service Training PF Checklist

Date: _____

Data collector's initials: _____

Staff Initials: _____

Activity _____

Did not provide feedback _____

On-the-job Training PF Checklist

Date: _____

Data collector's initials: _____

Staff Initials: _____

Activity: _____

Provided feedback within 10-20 minutes post observation _____

Provided praise _____

Provided corrective feedback _____

Provided statement on performance level _____

Maintenance PF Checklist

Date: _____

Data collector's initials: _____

Staff Initials: _____

Activity _____

Provided feedback in correct activity _____ (every 3rd observations and 6th observations)

Provided feedback within 5-10 minutes post observation _____

Provided praise _____

Provided corrective feedback _____

Provided statement on performance level _____

Appendix C

In-Service Training: Instructions for Participants

How to find opportunities to interact more frequently with our individuals

A large goal here at Hope Haven is to interact frequently and appropriately with our individuals continuously throughout the day. Interacting with our individuals can mean speaking with them about a variety of topics, assisting them with an ISP goal, assisting with meals, running a small group, etc. Interactions can be vocal or non-vocal. For example, when you are assisting someone, you might find yourself speaking out loud to the individual about what you are doing, or you might show them how to do something without speaking.

Most of the observed interactions have been positive and appropriate. I am reviewing examples of inappropriate interactions, so we all understand what they are. Examples include when we tell an individual to stop doing something (i.e., stop ripping up paper) without explaining why they should not or raising our voice at an individual. Telling an individual to "stop doing X" is not going to solve the problem. However, providing them a rationale or telling them what they should be doing instead, might increase the chances of them engaging in appropriate behavior. For example, "stop stealing markers from Billy because he will hit you," is an example of how you could provide a rationale for the individual's inappropriate behavior. Sometimes providing attention to inappropriate behavior might occasion the behavior to occur again if the

individual is seeking out your attention. Think about the function or the why behind the behavior!

You all are the experts! I have seen wonderful interactions between you and the individuals. However, we need to find ways to increase our appropriate interactions with our individuals to help facilitate ISP goals, happier individuals, and to make the day go by more quickly! We all know not everyone likes our attention or wants us to chat with them continuously. So, start seeking out individuals who do enjoy or welcome your attention and help. A CAG goal over the next few months is to increase our appropriate staff-individual interactions to at least 85% of the time while we are at Hope Haven. Today we are going to practice how we can find opportunities to engage with our individuals more frequently. Sometimes there are missed opportunities and therefore it is important to practice how to find or create opportunities!

Appendix D

In-Service Training: Instructions for Researchers

<***Model***: A researcher assistant (RA) and I will model two different clients (vocal and non-vocal). I will play DCS and RA will be the client. The RA will engage in appropriate behavior and inappropriate behaviors. I will model how to appropriately respond and initiate appropriate interactions. >

MAGGIE: DCS AND HELPER: CLIENT

MODEL 1: Appropriate behavior to reinforce

An activity is finished.

DCS: alright, we are done with coloring. I need everyone to help me with clean up!

Client: *picking up markers*

DCS: Thank you so much for picking up the markers!

Client: *smiles and continues to pick up markers*

DCS: *goes over to help with the markers but does not speak*

DCS: oh look its blue! Now you just put away the yellow!

Client: *shifts body away from DCS but continues to clean up.*

DCS: *(TO AUDIENCE) Ok she shifted her body away from me so that tells me I need to change my behavior and move on.*

MODEL 2: vocal client who engages in inappropriate behavior

DCS: alright, we are done with coloring. I need everyone to help me with clean up!

Client: (loud voice) YOU pick them up! I'm tired

DCS: I could really use your help, so we can start lunch.

Client: No, I do not want to help. LEAVE ME ALONE

DCS: *(looks at other clients who are helping).* Good job everyone! You all are doing a wonderful job.

Client: It is my choice and I do not want to clean up.

DCS: *(says to other clients)* I really appreciate you all helping! Who wants to play UNO?

Client: OH I WANT TO PLAY!

DCS: Wonderful! Can you push the chairs in and help me get the cards?

Client: Ok.

<***Role-Plays with feedback***: RAs and I will be clients while DCS. We will be both vocal and non-vocal clients at different times. We (clients) will engage in both appropriate and inappropriate behavior. Each role-play will include 10 opportunities for staff to appropriately interact with the researchers per scenario. Staff will role-play with the researchers until their staff-client interactions during the role play were positive and appropriate during at least 90% of the interaction opportunities for three consecutive role-plays. Each HH staff member will randomly choose a scenario. Each RA will randomly choose a client per scenario.

Scenarios: (sets the stage)

1. assisting with meal time
2. assisting with contract work
3. time for outdoor activity
4. Transition from high preferred activity to low preferred activity
5. Transition from low preferred activity to high preferred activity

6. focus group time
7. exercise time

Client roles:

1. appropriate behavior, compliant, vocal
2. appropriate behavior, compliant, non-vocal
3. inappropriate behavior, noncompliant, vocal (end on appropriate bx occurring)
4. inappropriate behavior, noncompliant, non-vocal (end on appropriate bx occurring)

Appendix E

Data Sheet for In-Service Training

Data collector's initials _____ Primary or IOA

Role-Play # _____

DCS Initial: _____

Scenario: _____

Opportunities to respond	Appropriate	Inappropriate	Missed
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Appendix F

Staff Session Performance Feedback Form (Phases 3 and 4)

Date: _____

Staff Initials: _____

Activity: _____

What you did well:

Next time try:

Percent of appropriate interactions: _____

Goal is 85%