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The Use of the Performance Diagnostic Checklist for Human Services to Increase Paraeducators' Effective Implementation of Error-Correction Procedures During Discrete Trial Training

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THE USE OF THE PERFORMANCE DIAGNOSTIC CHECKLIST FOR HUMAN SERVICES TO INCREASE PARAEDUCATORS' EFFECTIVE IMPLEMENTATION OF ERROR-CORRECTION PROCEDURES DURING DISCRETE TRIAL TRAINING

by

Melissa Bowe

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ABSTRACT

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by

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The Performance Diagnostic Checklist for Human Services (PDC-HS) has been used in treatment clinics to identify the variables contributing to poor employee performance, and subsequently recommend an intervention to improve performance. The special education classroom, where special education teachers supervise paraeducators' skills and performance and are responsible for providing training, may represent a setting where the PDS-HS can be applied. The purpose of this study was to evaluate the effectiveness of the PDC-HS, as completed by classroom teachers, in a public school special education setting to improve performance of paraeducators for discrete trial instruction.

(56 pages)

PUBLIC ABSTRACT

The Use of the Performance Diagnostic Checklist for Human Services to Increase Paraeducators' Effective Implementation of Error-Correction Procedures During Discrete Trial Training

Melissa Bowe

Employees in the field of human services can influence the health and rate of progress of the clients they serve. A human service supervisor's responsibilities include identifying why an employee may be performing poorly and provide an effective intervention to ensure improved performance. The Performance Diagnostic Checklist for Human Services (PDC-HS) has been used in treatment clinics to identify the variables that can contribute to poor employee performance, and subsequently recommend an intervention to improve performance.

The special education classroom is a human service setting in which special education teachers supervise paraeducator's skills and performance. A paraeducator's role includes providing instruction to students. Discrete trial instruction is an effective method for students requiring specialized instruction to acquire new skills and concepts. Poor instruction can have an adverse impact on a student's performance resulting in a slow rate of progress or regression. Special education teachers are trained in specialized instruction, behavior management and classroom organization, but are rarely prepared to supervise and train other adults. Additional challenges are time to provide professional development and training preparation, given the background and experience of

paraeducators. Research has demonstrated that a systematic approach for training and performance evaluation is required in order to provide quality instruction.

This research evaluated the effectiveness of the PDC-HS, as completed by classroom teachers, in a public school special education setting to improve the performance of paraeducators for discrete trial instruction. Three teachers first identified which paraeducators were not correctly implementing the steps for discrete trial instruction. They then used the PDC-HS to determine why their paraeducators were performing poorly and which interventions could improve their performance.

The results indicated that a lack of training was contributing to poor performance and a Behavior Skills Training (BST) package would most likely increase their performance. The BST package began with defining the steps for discrete trial instruction, modeling the steps, practicing the steps and providing feedback on progress. Once the paraeducator was able to correctly demonstrate the steps with an adult, they were able to continue instruction with their students. The data demonstrated that their performance significantly increased after they were provided BST.

The social validity results indicated that the teachers had a positive experience using the PDC-HS. All teachers reported that this was the first time they had consistently taken data on a paraeducator's performance and were appreciative of the training and pleased with the results. The results also indicated that all were unaware of their paraeducator's skill in discrete trial instruction and saw the value and outcomes of using data analysis for both the paraeducators and the students they were working with.

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Melissa Bowe

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INTRODUCTION

The human service field has been defined as “a professional approach to helping individuals, families and communities address their unique needs” (Woodside & McClam, 2012, p. 2). The individuals who work in this field can impact the health and rate of progress of the clients they serve. Poor employee performance in the human service setting can have an adverse effect on clients; for example, impeding their rate of progress or causing undue harm (Carr, Wilder, Majdalany, Mathisen, & Strain, 2013). One of the roles of a human service supervisor is to identify why an employee is performing poorly and intervene to ensure performance is improved.

An effective method for identifying factors associated with poor performance is a functional assessment. Functional assessment of problem behavior has become an evidence-based practice in the field of behavior analysis (e.g., Hanley, Iwata, & McCord, 2003). Functional analysis is the systematic process of identifying variables that contribute to the occurrence of problem behavior. Based on the variables identified, an intervention is then selected to improve the behavior. Past researchers have demonstrated that interventions based on the identified function of the problem behavior are more successful at reducing the problem behavior and increasing appropriate behavior than non-function based interventions (Iwata, Pace, Cowdery, & Miltenberger, 1994; Repp, Felce, & Barton, 1988). Conceivably, an employer might use this method to identify the maintaining variables of problematic employee performance in a systematic manner, and subsequently select a matched intervention that saves time and is more likely to lead to

long-term desirable outcomes.

The Performance Diagnostic Checklist (PDC), based on a functional assessment approach, was developed by Austin (2000) to assist employers in determining the variables that might impact employee performance in private industry. The results of the assessment indicate function-matched interventions that target the employee's problem behavior for improvement. Carr et al. (2013) modified the checklist to address the environmental factors that may impact performance for those working in the field of human services. The Performance Diagnostic Checklist – Human Services (PDC-HS) is a functional assessment composed of 20 questions that requires either informant report or direct observation. Upon completion, the checklist then guides the employer to select from among several evidence-based and function-matched interventions to improve employee performance. Specifically, the Intervention Planning Section assists the employer in selecting an intervention, or several interventions, in one of the following areas: (a) training, (b) task clarification and prompting, (c) resources, materials, and processes, and (d) performance consequences, effort, and competition (Carr et al. 2013).

Research demonstrates that the PDC-HS is a successful tool for supervisors, who are also Board Certified Behavior Analysts (BCBAs) with master or doctorate degrees, in university-based autism treatment centers. In both the Carr et al. (2013) and the Ditzian, Wilder, King, and Tanz, (2014) studies, the responsibilities of a BCBA included supervising the therapists assigned to work with children with autism. The therapists were graduate-student employees at the treatment centers. The supervisors used the PDC-HS to determine the variables that impacted poor performance of the therapists in their

assigned duties and develop corresponding treatments to improve that behavior (Carr et al., 2013; Ditzian et al., 2014).

Human service environments also include schools. The special education classroom, where special education teachers supervise paraeducators' skills and performance, and are responsible for providing training, may represent a setting where the PDC-HS can be applied. One of the duties of a paraeducator is to assist with instruction of students in the classroom. Discrete trial training (DTT) is an effective teaching procedure for children with autism and requires the instructor to follow specific guidelines during the instruction (Smith, 2001). The teacher provides the initial training to paraeducators and then evaluates the paraeducators' performance to ensure the guidelines are being followed. Managing the consequences of a student error (e.g., stopping the trial, removing materials, collecting data) is one area in DTT procedures in which the teacher may be able to use the PDC-HS to improve paraeducator performance in the classroom.

Past research has found that even though the roles and responsibilities of the paraeducator have expanded through the years, the majority are not trained to assist in providing instruction and behavior management (Giangreco, Broer, & Edelman, 2002). Special education teachers are trained in specialized instruction, behavior management and classroom organization, but are rarely prepared to supervise and train other adults (Carnahan, Williamson, Clarke, & Sorensen, 2009). Additionally, factors such as time to provide professional development and training preparation, given the background and experience of paraeducators, can also be a challenge for teachers (Forbush & Morgan,

2003). Maggin, Wehby, Moore-Partin, Robertson, and Oliver (2009) considered the problem of how to support paraeducators to provide quality instruction and determined that the most efficient method is to increase the capacity of the teacher to supervise the paraeducators in the classroom. Their strategies to do so include a systematic approach to training for tasks and performance evaluation to ensure assigned duties are implemented successfully. A systematic approach that efficiently analyzes paraeducator performance could assist teachers in developing targeted interventions for their employees in a timely manner. Further research is needed to determine if the PDC-HS can be used in settings such as a special education classroom and with different classes of participants, such as special education teachers, to effectively identify barriers in employee performance and identify the intervention(s) resulting in improved classroom performance.

CHAPTER II

LITERATURE REVIEW

I researched the use of an assessment tool titled the Performance Diagnostic Checklist – Human Services (PDC-HS). I identified additional articles to review by searching the terms *performance diagnostic checklist*, *performance analysis*, *performance feedback* and *employee performance* with Google Scholar, the Ebsco Host database (Eric and Academic Search Premier), and the reference section from related articles. The data-based research yielded 78 results related to performance diagnostic checklist, and four related to the PDC-HS. I narrowed the field to include an article describing the use of the PDC in a grocery store to improve customer service behavior by Rice, Austin, and Gravina (2009). The authors suggested that the use of a functional approach in Organizational Behavior Management (OBM) could increase a manager's capacity to develop and implement interventions which could also lead to behavioral maintenance. I then selected Carr et al. (2013), who reviewed the development of the PDC, but then proposed a modified version titled the PDC-HS that specifically addressed the maintaining variables in the human service employment field. The third article conducted research in a similar setting and with similar participants on the PDC-HS and is included as a basis for continuing research on the PDC-HS.

Rice et al. (2009) examined the use of a functional assessment in OBM as a functional approach to evaluate potential variable(s) that impede employee performance and the use of interventions that address those variable(s). The authors first reviewed previous studies that have improved customer service behavior using multiple

interventions. Differences among results in past studies were noted as a limitation. The differences were hypothesized to have occurred because past researchers did not use a functional approach to address the variables that contribute to poor behavior. A second limitation of past studies of OBM is that the researchers implemented the described treatments, as opposed to the managers or supervisors. The PDC was used in this study as a functional assessment to first determine potential variables impeding customer service behavior and secondly to develop an intervention to improve those behaviors.

The participants for the study were 12 full- and part-time workers ranging in age from 19 to 70 years old and took place in a grocery store in the Midwestern U.S. The dependent variable was the percentage of correct greetings or closings. A correct greeting required three components: (a) the employee giving eye contact to the customer, (b) the employee turning up the corners of the mouth to smile, and (c) conveying one of three greetings ("Good morning," "How are you today"? or "Welcome to [name of the store]"). A correct closing included the same three elements with the verbal greeting changing to "Good-bye," or "Have a nice day." An observer, seated near the front door or dining area of the setting, collected data during arbitrarily selected times of the day and days of the week. At least 10 opportunities to interact were collected for each observation and converted into a data point by dividing the number of correct greetings or closings by the total number of observations. The employees were not aware of the observations. The PDC was used to identify the variables that may be maintaining poor customer service behavior. The results indicated that written job descriptions and job or task aids listing expected behaviors and when to engage them were not in place and managers were

inconsistently providing consequences, delivering feedback and monitoring customer behavior performance. A package of task clarification and social praise were selected to address the function of the identified variables that would be implemented by the manager to all participants concurrently.

The authors used a multiple baseline design across behaviors to evaluate the effects of the interventions. Baseline was established for 25 sessions before the intervention package of task clarification and social praise was implemented. Task clarification consisted of the manager meeting individually with each employee to review a script for each set of greeting and closing behaviors. The manager was then trained to recognize a correct greeting or closing with social praise by approaching the employee and saying, “Great job on your greeting,” or “That was great customer service.”

The results for correct greetings in baseline demonstrated a mean percentage of correct greetings of 11.5%. The mean percentage increased to 66% during treatment and to 70% at a 48-week follow-up. New employees that did not receive treatment had a mean percentage of 46.7% at the follow-up check. The baseline mean for percentage of correct closings was 8%. After treatment the percentage increased to 70% with the 48-week follow-up at 76.7% and for new employees at 40% that did not receive treatment. The manager was given the scripts to use with new employees but post-intervention checks revealed that they were not used along with a discontinued use of social praise. The manager reported a nonpreference for social praise that could have led to a lack of maintenance to the technique. He found it difficult to remain in the vicinity for the interaction to occur and having time to offer the social praise. Consecutive customer

interactions also made it difficult to have the opportunity to offer praise. It was acknowledged that the low acceptability of social praise was a limitation of the study. Future research was suggested on identifying systems to deliver praise in a frequent and easy manner that is acceptable to managers. Another limitation was the intervention package of two components and future studies could include a component analysis of the intervention. The authors also suggested that interventions not based on the results of the PDC could have resulted in improved behavior. A comparison of interventions based on the PDC results to arbitrarily selected interventions or contraindicated interventions would assist in the validation of the PDC as a functional assessment tool. The authors also identified a limitation in the use of a two-part multiple baseline design that can only assess limited internal validity.

The successful use of the PDC to improve employee performance has led to the modification of the original checklist for use in the human service setting. Carr et al. (2013) recognized the value of the PDC in a human service setting to assist in conducting a functional assessment of performance issues, but also acknowledged that several items were not applicable to the human setting. He identified specific variables in the human service setting relevant to performance and developed the PDC-HS. The PDC-HS also includes an Intervention Planning section listing specific evidence-based interventions with accompanying literature citations to guide the selection on interventions. The purpose of the study was to examine the effects of the selection of treatment-based interventions based on the results of the PDC-HS.

The participants in the Carr et al. (2013) study were 15 graduate students enrolled

in ABA master's program and employed at a university-based treatment center where they worked one-on-one with children with autism between 3 and 7 years of age. Therapy sessions occurred for 1.5 hours in 3 m by 3 m treatment rooms and participants were assigned to clean them at the end of the session. The dependent variable was the percentage of completed tasks on a treatment room cleanliness checklist. Observers completed the checklist 10-15 min after each session ended. Once a baseline was established and data collected, three supervisors who were BCBAs with masters or doctorate degrees were individually interviewed using the PDC-HS for questions that required informant report. The remaining questions were completed through direct observation. Interventions were identified and implemented after determining the results of the PDC-HS.

The Carr et al. (2013) study evaluated the effects using a concurrent multiple-baseline design (Cooper, Heron, & Heward, 2007) across treatment rooms. Data from all three respondents on the PDC-HS demonstrated higher percentages of no responses in the areas of *Training* and *Feedback on Performance.* The two remaining areas of *Task Clarifying* and *Prompting and Resources, Materials,* and *Effort and Competition* had the lowest percentages of no responses. Higher percentages indicated an area with a problem. Training and posted graphed feedback (feedback on performance) were indicated by the PDC-HS and used for the first intervention. Two of the rooms used a second intervention that was not identified as a problematic area on the PDC-HS to provide a comparison to the PDC-HS intervention. The PDC-HS-nonindicated intervention was introduced before the PDC-HS identified intervention of training and posted graphed feedback. The second

PDC-HS-nonindicated intervention was task clarification and increased availability of materials. The effectiveness of the interventions was measured by the percentage of completed tasks.

Baseline data yielded a mean range of 18-41% of task completion of cleaning duties across all rooms. The nonindicated intervention was introduced in two of the rooms after baseline and achieved 36% and 12% completed cleaning tasks between the two rooms. The mean range during the PDC-HS identified intervention phases of training and posted graphed feedback for all rooms was 80-100% of completed cleaning tasks. The interventions selected based on the PDC-HS results were successful in improving the cleaning of therapy rooms. The alternative intervention selected not based on the PDC-HS results had no significant change in comparison to baseline in the two rooms it was implemented.

Limitations of the Carr et al. (2013) study include only assessing a limited range of interventions from the intervention planning section, not assessing other PDC-HS-nonindicated interventions, only assessing a combined treatment package vs. a single-intervention component, only assessing a limited number of informants, and the difficulty of identifying behavior deficits through direct observation. Researchers suggested further research of replication of the effects of the PDC-HS in different settings and with different classes of human-service employees, an evaluation of the full range of variables on the PDC-HS, and a comparison of interventions between those who do and do not use the assessment.

Ditzian et al. (2014) achieved similar results as the Carr et al. (2013) study in

evaluating the PDC-HS using comparable participants and a university based setting. The purpose of the Ditzian et al. study was to examine the effectiveness of the PDC-HS in determining the treatment needed to produce consistent securing of therapy doors in an autism treatment center. The supervisors had BCBA certification and the participants were four female therapists employed by the clinic. A PDC-HS-nonindicated intervention was also evaluated for comparison. The supervisors of the center identified failure to maintain secure therapy doors was resulting in an increase in clients eloping into hallways and the noise level in the hallways, as well as potential risks to client privacy and confidentiality. The dependent variable was the behavior of the therapist closing a door with the latch secured each time she passed through the doorway. Data were collected on the percentage of opportunities the therapist closed the door from live and videotaped sessions.

Baseline levels of door closing were established, and then the researchers administered the PDC-HS to the supervisors. PDC-HS indicated and PDC-HS-nonindicated interventions were then developed and implemented. The PDC-HS identified lack of consequences as the variable contributing to poor employee performance and indicated individual verbal and graphed feedback delivered by a supervisor as the function-matched intervention. The nonindicated intervention consisted of a written prompt posted by the door stating: “please remember to keep the door closed at all times.” A concurrent multiple baseline design across participants was used to evaluate the effects of the interventions.

The results from the Ditzian et al. (2014) study depicted a low rate of door

securing during baseline, with an average range of door securing in 1-14% of opportunities. The introduction of the PDC-HS-nonindicated intervention for two of the participants resulted in door securing occurring in 4% and 6% of opportunities. The introduction of the PDC-HS indicated intervention resulted in an increase of door securing to a range of 66-80% of opportunities. These results suggested that the PDC-HS was a useful tool to identify effective interventions for poor employee performance. Desired results were achieved from implementation to skill acquisition in seven sessions for participants with one function-based intervention and in 14 and 18 sessions for participants starting with a non-function based and concluding with a function-based intervention.

The authors in the Ditzian et al. (2014) study pointed out that questions requiring informant report may be the most viable approach in identifying behavior that is influenced by rules or other events. The informant report can hypothesize the antecedents and consequences that can be temporally distant from the target behavior and occur in organizational settings. The PDC-HS combines informant report with direct observation in an attempt to obtain accurate information on employee performance. Limitations of the study included only one PDC-HS indicated intervention was analyzed and others may have also been effective and that the supervisors may have been able to identify the maintaining variables without the use of the PDC-HS and further research could assess this area.

Researchers have demonstrated that the PDC-HS is effective at identifying variables related to poor performance for employees responsible for meeting the needs of

others in a university-based treatment center. The Carr et al. (2013) study examined the effectiveness of the PDC in identifying interventions to improve employee's performance in room cleaning tasks while the Ditzian et al. (2014) study used it to improve the securing of doors. Both sets of skills are discrete, well defined and relatively simple tasks. Just as special education teachers use tools to identify interventions for their students, they may also use the PDC-HS to identify interventions for the paraeducators in the classroom. This study examined a more complicated skill set in the special education classroom. Smith (2001) stated that in order for discrete trial training (DTT) to be an effective teaching procedure it requires the instructor to follow specific guidelines during the instruction. This study examined a specific portion of the delivery procedures for DTT, specifically managing consequences of incorrect responses. The purpose of the current study is to evaluate the effectiveness with which teachers use the PDC-HS in a public school special education setting to improve performance of paraeducators.

Purpose Statement

The purpose of this study was to examine the utility of the PDC-HS in a special education classroom setting when used by a teacher to identify the factors contributing to poor performance in paraeducators in the delivery of discrete trial teaching procedures. The research further evaluated the effectiveness and ease of implementation of the interventions recommended from the results of the special education teacher's responses on the PDC-HS.

Research Question

To what extent will the use of the PDC-HS, as completed by special education teachers, identify the variable(s) maintaining paraeducators' substandard performance for error correction instruction steps, and identify interventions that are effective at increasing correct implementation of error correction procedures during discrete trial teaching?

CHAPTER III

METHODS

Participants and Settings

The participants were four female special education paraeducators and their supervising special education teachers (three total). The participants were selected through suggestions from classroom teachers and were then asked for consent to join the study. Eight paraeducators originally gave consent to participate. A checklist with eight components of managing consequences for an error in discrete trial instruction was used to determine participants that demonstrated poor delivery of the components. The criteria indicated paraeducators with a performance below 70% across three consecutive observations. The four participants who qualified had been delivering discrete trial instruction to students in the classroom for 4 months to 2 years at the time data collection began and were all initially trained by their supervising teacher.

The study was conducted across three early childhood special education classrooms located in public schools and utilized discrete trial training as a main method of instruction. All discrete trial instruction sessions occurred in a partitioned section of the classroom that reduced the noise and distraction that can occur with daily routines of other students and staff in the classroom. Partitions also blocked the participants from observing other participants running discrete trial instruction and possibly confound results. The student sat at an appropriate-size table for a preschooler with the paraeducator sitting to the side. All sessions occurred within the participant's assigned

instruction time.

Preintervention Assessments

A checklist was used to evaluate the performance of paraeducators to manage a student's incorrect response during discrete-trial instruction. The checklist components were obtained from a larger discrete trial checklist that is part of a self-instructional manual and has been shown to be effective in past research (i.e., Arnal et al., 2007, Thiessen et al., 2009, Thompson et al., 2012). The checklist is composed of eight components needed to appropriately manage incorrect responses for discrete trial instruction. Each time a child elicited an incorrect response; the data taker would observe and collect data on the paraeducator's response in completing each of the eight components correctly. This process occurred for the first five occurrences of an incorrect response. Once a baseline was established meeting the criteria of below 70% across three consecutive sessions, the special education teacher completed a PDC-HS on each participant. Any response of *no* to a question on the PDC-HS was considered for an area for intervention. The special education teacher then referred to the PDC-HS Intervention Planning guide and selected one intervention to address the performance problem and another intervention from an area not indicated to be a performance problem.

Dependent Variable and Response Measurement

The dependent variable was the percent of correctly completed steps performed by paraeducators when responding to an incorrect student response as measured by the

checklist. An eight-component checklist (see Table 1) was used to record the occurrence or nonoccurrence of each item on the checklist. The observer used the checklist for the first five opportunities the paraeducator had to respond to a student error in a DTT session. For each opportunity to manage the consequences of an incorrect response during instruction, the observer would record the correct occurrence or nonoccurrence of each behavior on the checklist. This procedure provided eight components for each student error. Given that the checklist was used for the first five errors, 40 data collection points per data collection session were possible. If there was not an opportunity for the paraeducators to perform the behavior, the item was marked *not applicable* and not included for the total count of opportunities.

The total number of occurrences of each checklist item was divided by the total

Table 1

Discrete Trial Instruction Checklist

Steps	Operational definition
1. Block gently, remove materials, look down (2-3 secs.)	1. End the trial as soon as a student attempts to make an incorrect response. Block contact with the materials (if any) and look down/away. Remove the materials.
2. Record incorrect response	2. Record data
3. Secure child's attention	3. Secure attention by gaining eye contact.
4. Re-present materials	4. Re-present the materials if needed for the target response
5. Re-present instruction & prompts to guarantee correct response	5. Give instruction while immediately providing a prompt to give a correct response.
6. Give praise only	6. Give verbal praise only
7. Record error correction	7. Record data indicated as error correction
8. Have brief inter-trial interval (3-5 secs.)	8. Intertrial is time between trial completed and subsequent trial

opportunities (occurrences and nonoccurrences) and then converted to a percentage to obtain a percentage of correctly completed responses.

Interobserver Agreement

A second data collector simultaneously collected data (see Table 2) on the delivery of discrete trials and scored independently for purposes of interobserver agreement. The second observer collected data for a mean of 37% per baseline conditions, 56% of nonindicated conditions and 33% of indicated sessions using a trial by trial-by trial interobserver agreement formula (Cooper et al., 2007). This was calculated by dividing the number of agreements by the sum of the total number of agreements and disagreements. That number was then converted to a percentage. The mean was

Table 2

Data Collection Sample

	Managing consequences for an incorrect response	1	2	3	4	5	Total	%
1	Block gently, remove materials, look down (2-3 secs.)							
2	Record incorrect response							
3	Secure child's attention							
4	Re-present materials							
5	Re-present instruction & prompts to guarantee correct response							
6	Give praise only							
7	Record error correction							
8	Have brief intertrial interval (3-5 secs.)							

Note. + correct response, - incorrect response.

1. Total each column with the number of correct responses over the number of opportunities to respond
2. Add the total number of correct response and divide by the total number of opportunities to respond
3. Multiply by 100 to determine the percent of correct responses

calculated by dividing the mean of each condition per participant by the number of participants. An agreement was defined as both observers indicating the same answer from a respondent. Participants 1, 2, 3, and 4 had the following mean agreements across all conditions, respectively: 95% (range, 93 % to 100%), 95% (range, 93% to 96%), 98% (range, 97 % to 100%), and 95% (range, 92% to 100%).

The data collectors were trained on the discrete trial checklist in the classroom where the research would take place. A systematic approach to training the data collectors followed the steps outlined by Cooper et al. (2007). Training adhered to the following steps.

1. The data collectors reviewed the forms, definitions of the behavior and the procedures for recording the behavior with the researcher. Examples and nonexamples of each target behavior were defined.

2. The data collectors practiced observing and recording data from recorded discrete trial sessions performed with students of the target age group for the study. The recorded sessions included opportunities to make increasingly difficult discriminations of the target behavior. The data collectors rescored the same sessions a second time to compare the reliability of their measures. This was to ensure they were consistently applying the measurement system. Once the data collectors had reached 90% accuracy in comparing their own results across three consecutive sessions, they preceded to the next step.

3. The data collectors practiced in live sessions in the natural environment until 90% agreement with a second data collector was achieved across three consecutive sessions.

Treatment Integrity

Direct observation was used to measure the implementation of the intervention. The teacher and the student researcher recorded the occurrence or nonoccurrence of required behavior for the nonindicated and indicated intervention. In order to account for

teacher reactivity, the observations were as unobtrusive as possible, unscheduled and unannounced. The items on the checklist were operationally defined and reviewed by both the teacher and student researcher (see Table 1). The teacher completed all antecedent checklist items prior to the initial session to ensure all required training was completed.

The student researcher served as the second observer and recorded data on the proper implementation of the PDC-HS intervention. The intervention was implemented based on the procedural steps outlined by the teacher and student researcher. Literature citations in the Intervention Planning section of the PDC-HS were referred to in developing the steps. Treatment integrity was collected at the initial session in each condition. Both the nonindicated and indicated interventions steps included training activities to be performed before the first session of data collection for each intervention. The nonindicated intervention included one step inquiring if the discrete trial checklist was in view that was observed during the intervention. A percentage score was calculated by dividing the number of correctly implemented steps divided by the total number of steps and multiplying by 100%. Treatment integrity was 100% across all participants and conditions (see Appendices A and C for treatment integrity checklists).

Experimental Design

A concurrent multiple baseline across subjects was used for the experimental design (Cooper et al., 2007). This design was used to measure the effects of the intervention selected based on the results of the PDC-HS. This design was selected to

demonstrate each participant's performance as the independent variable of a PDC-HS single intervention is applied independent of the other participants.

Experimental Procedures

Baseline

The baseline condition consisted of measuring the current performance of paraeducators percentage of correctly completed steps in managing the consequences of an error in discrete trial instruction. Each participant was scored on the first five opportunities to respond to an incorrect response once a work session had begun with a student. The teacher observed from 5-7 ft. away from the work session and collected the required information for each step. The teacher did not provide any instructions, prompts, or feedback. Baseline was established once an even stable rate of at least three data points was obtained.

Problem Performance Identification

Once baseline was established the researcher and special education teacher reviewed the DTT checklist results for each paraeducator in order to determine the checklist item(s) with which the paraeducator was consistently making performance errors. The researcher read each item out loud on the PDC-HS to the teacher and answered any questions the teacher had. The researcher scored each item with the teacher's response. Seven of the questions required direct observation, and were scored upon observation and agreement by both the teacher and researcher. The questions were divided among 4 intervention areas: (a) training, (b) task clarification and prompting, (c)

resources, materials, and processes, and (d) performance consequences, effort, and competition. Each question answered as *no* was considered for intervention, regardless of the area. For the purposes of this study to compare a nonindicated to an indicated intervention, a nonindicated intervention was implemented first to determine if an intervention not based on the function of the employee performance problem would increase the paraeducators skill in managing the consequences of an error in DTT.

PDC-HS-Nonindicated Intervention:
Task Clarification

A PDC-HS-nonindicated intervention was chosen based on those items not identified as problem areas on the PDC. The purpose of this condition was to compare the effectiveness of the PDC-HS-intervention to the PDC-HS-nonindicated intervention. The teachers noted that the checklist data results revealed that the paraeducators were not consistently following the operational definition for step one which was “End the trial as soon as a student attempts to make an incorrect response.” Paraeducators repeated the instruction twice if the student made an incorrect response or no response without completing the whole process indicated by the checklist to manage an error. Two teachers had no steps for discrete trial instruction posted in the instruction area. One teacher had the steps posted, but no operational definitions of the steps were included. The teachers chose to implement a nonindicated intervention in the area of Task Clarification and Prompting by posting the steps to manage the consequences of an error and include a definition of what an error was. In order to analyze the effects of a similar nonindicated intervention, the teachers in collaboration developed a definition of what an error was and

included it on the checklist highlighted in yellow (see Appendix A and B)**.**

PDC-HS-Indicated Intervention One:
Training

All teachers selected and implemented the same indicated intervention of behavior skills training (BST) in the area of Training. This was the only area that scored 100% across participants. The other suggested intervention of improved personnel selection in the area of Training was not a viable option. The teacher met with the participant individually in the classroom. She gave the participant a description of the DTT error correction procedures, explained them, and answered any questions. Next the teacher demonstrated the error correction steps for the participant, with the para playing the role of the child. The teacher then switched roles and asked the participant to practice the error correction procedure. The teacher provided feedback throughout the role play. The BST ended when the participant demonstrated correct implementation of the procedures with at least 90% accuracy across five error correction opportunities. A training checklist for implementation was developed from a review of the literature cited on this intervention in the PDC-HS (See Appendix C). A criterion for responding of 90% or higher for at least three consecutive data collection opportunities ended the condition and deemed the intervention successful.

PDC-H-Indicated Intervention Two

If participants did not meet the criterion of 90% or higher of correctly completed steps of discrete trial delivery and more than one intervention was indicated by the PDC-HS, intervention two would have been implemented. Data would have been collected

starting the first day of implementation and monitored for a sustained level of responding (three data points consecutively at 90% or higher). The PDC-HS intervention one was successful in this study. This phase was not needed.

Social Validity

A social validity measure was given to the teachers to complete after all data were collected for the study. The measure consisted of 10 statements regarding the PDC-HS. The rating scale ranged from a score of 1 for strongly disagree to 5 for strongly agree (see Appendix D).

CHAPTER IV

RESULTS

The PDC-HS results are illustrated in Figure 1. All respondents indicated *no* for all responses in the Training section designating it as an area that may have been contributing to poor employee performance. For respondent 1, 40% of the questions and for respondents 2 and 3, 80% of the questions on the Performance Consequences, Effort and Competition section suggested a problem making it the second area to consider for an intervention. For respondents 1 and 2, 0% of the questions and for respondent 3, 30% of the questions in the Resources, Materials and Processes section suggested a problem. The results indicated this area was not a concern and designated it as the first area to consider for a nonindicated intervention. For respondent 2, 0% of the questions, respondent 1,

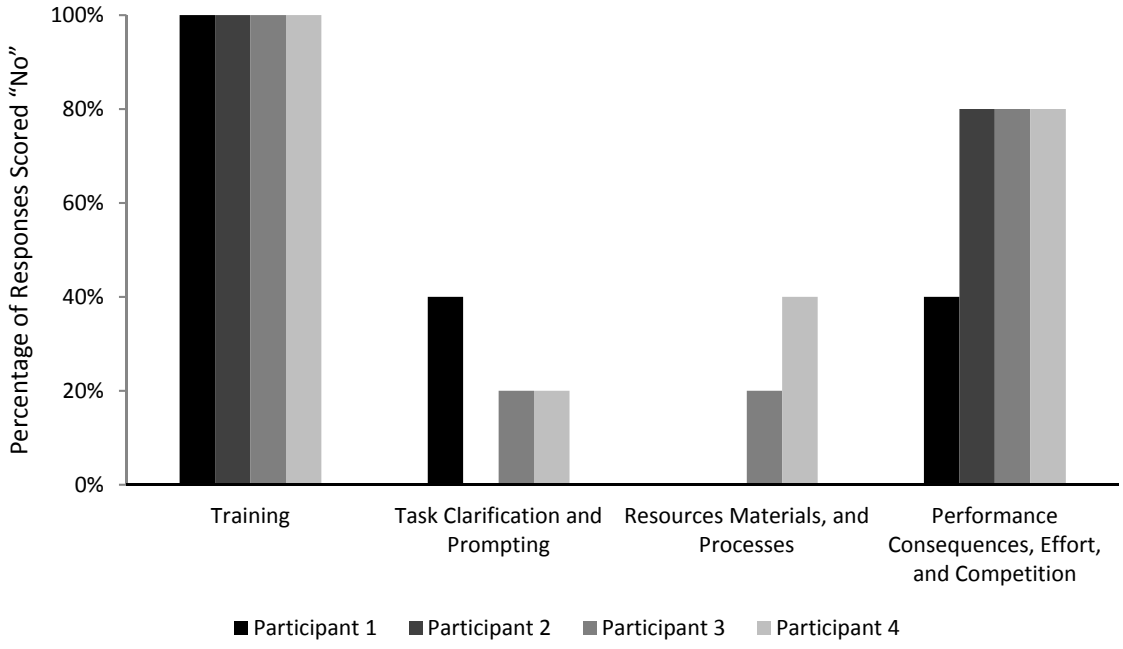

Figure 1. PDC-HS results of three teachers' responses to the performance of four paraeducators.

40% of the questions and for respondent 3, 20% of the questions in the Task Clarification and Prompting section suggested a problem indicating this is not a significant area of concern. After reviewing the results, all teachers and the researcher decided to implement the same nonindicated and indicated interventions. Items frequently endorsed with *no* are those indicated for intervention. All respondent results revealed similar percentages across all four areas.

All four participants met the performance criterion of below 70% correctly implemented steps for managing the consequences of an error across three consecutive observations for inclusion at baseline. In baseline, Lisa demonstrated variable responding ranging from 47-72%. Linda demonstrated variable responding over eight baseline sessions ranging from 12-35%. Carly demonstrated low variable responding ranging from 12-35% across 11 sessions in baseline. Paula remained in baseline for 14 sessions with responding ranging from 10-32%.

In the nonindicated intervention (task clarification and checklist) condition, Lisa's performance began at 60%, increased to 92% in the second session in this condition, followed by a steady decrease across three sessions that ended at 67%. Linda demonstrated low, stable responding, ranging from 20-30% across three sessions. Carly had variable responding throughout the condition ranging from 35-82% across four sessions. Paula had moderate stable responding ranging from 52-60% across three sessions. All four participants failed to meet the performance criterion of 90% or higher of correctly completed steps.

The BST component was conducted as the indicated intervention. All four

participants met the criterion of the BST component. In the indicated intervention condition (training) Lisa's responding increased to 87% in the first session and then remained at or above 90% for the remaining four sessions. Linda demonstrated variable responding across the first four sessions ranging from 75-90%. Responding in the fourth session in this condition was 80%, a 10% drop from the previous session. This session occurred following a 1-week break for the entire classroom. The researcher and teacher decided to implement a coaching session, as part of the BST model, to improve employee performance. The teacher repeated the BST component by reviewing the steps for the error correction procedure. The teacher then demonstrated the steps with the para with the para playing the role of the child. The teacher and para then switched roles and the para practiced the steps for error correction with feedback provided throughout the role play. The coaching session ended when the para completed 90% of the steps for error correction across five opportunities. After the coaching session, the mean of the next three sessions was 96%. Carly demonstrated high stable responding in the indicated intervention condition ranging from 90-98% across three sessions. Paula also demonstrated high stable responding in this condition ranging from 95-100 % across three sessions. A second indicated intervention was not needed for any of the participants (see Figure 2).

The results of the social validity measure revealed a similar trend across the three teachers, with one teacher indicating a higher score in some areas. Two teachers agreed somewhat that the PDC-HS was easy to use, whereas one teacher was neutral. One teacher strongly agreed that she would use the PDC-HS in the future, and the other two

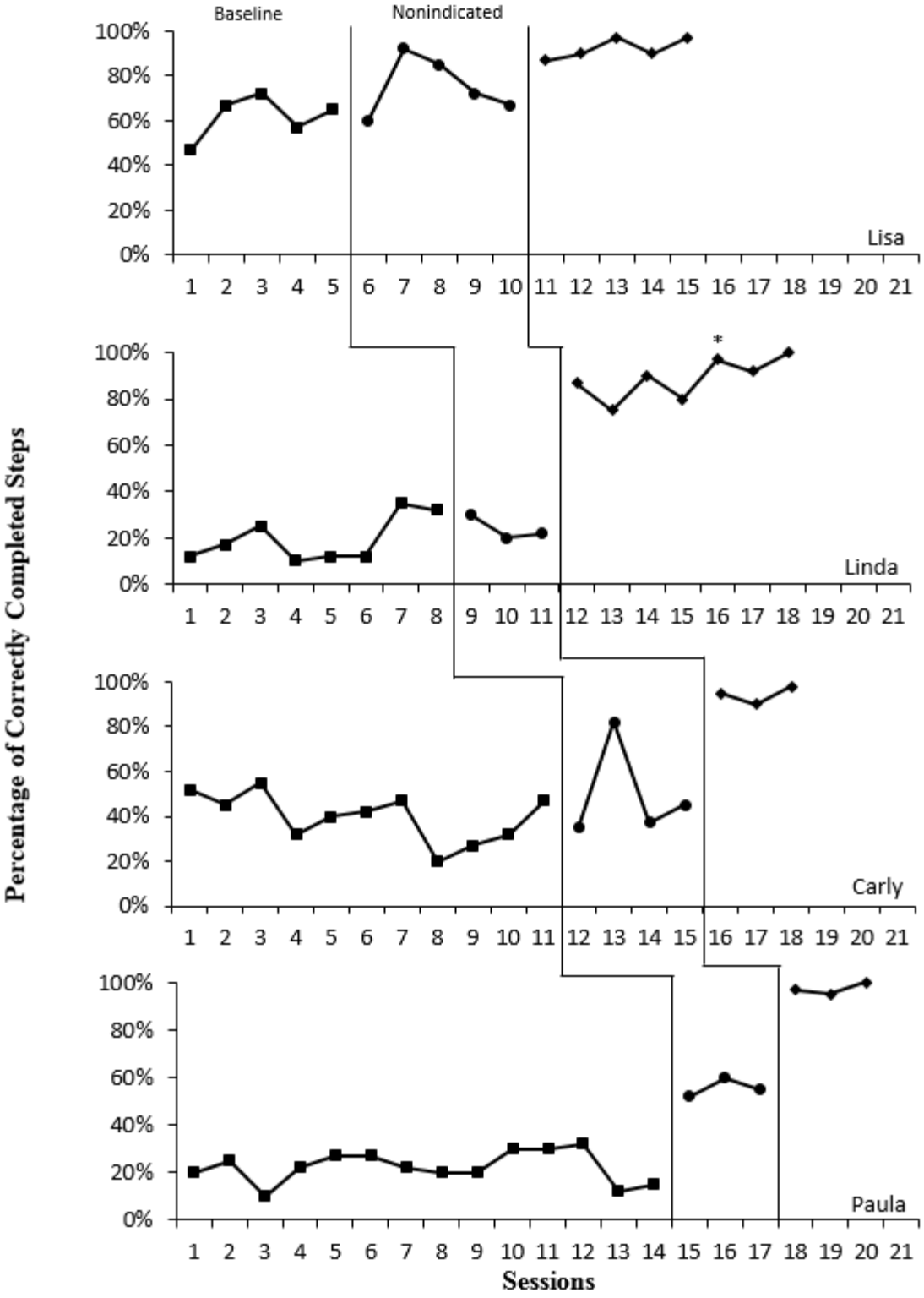

Figure 2. Results of PDC-HS nonindicated and indicated intervention (*coaching session).

indicated that they agreed somewhat. All teachers marked disagree somewhat or strongly disagree that they were confident in addressing staff performance problems before using the PDC-HS. The statements of “After using the PDC-HS I am confident in addressing staff performance problems”, “The PDC-HS is easily incorporated into my performance evaluation systems,” and “I would recommend the PDC-HS to other educators” all had mixed results with one indicating strongly agree, one indicating agree somewhat and one indicating neutral. All teachers agreed somewhat that the time requirements of using the PDC-HS were reasonable. One teacher strongly agreed that the PDC-HS was overall an effective tool to identify and improve paraeducator’s DTT performance and that she was satisfied with the outcomes of using the PDC-HS. The other two teachers indicated agree somewhat for both items.

The social validity results indicate that the teachers had a positive experience using the PDC-HS. All teachers reported anecdotally that this was the first time they had consistently taken data on a paraeducator’s performance and were appreciative of the training and pleased with the results. It was also indicated that all were unaware of their paraeducator’s skill in managing the consequences of error correction and saw the value and outcomes for both the paraeducators and the students they were working with through collection and analysis of the data (see Table 3).

Table 3

Social Validity Results

Item	Teacher 1	Teacher 2	Teacher 3
1. The PDC-HS is easy to use.	4	4	3
2. I will use the PDC-HS in the future.	4	5	4
3. Before using the PDC-HS I was confident in addressing staff performance problems.	1	2	2
4. After using the PDC-HS I am confident in addressing staff performance problems.	3	5	4
5. The time requirements of using the PDC-HS are reasonable.	4	4	4
6. The PDC-HS is easily incorporated into my performance evaluation systems.	3	5	4
7. Overall, the PDC-HS is an effective tool to identify and improve paraeducator's delivery of discrete trial instruction.	4	5	4
8. I would recommend the PDC-HS to other educators.	4	5	3
9. I am satisfied with the outcomes of using the PDC-HS.	4	5	4

Note. Strongly disagree = 1; Disagree somewhat = 2; Neutral = 3; Agree somewhat = 4; Strongly agree = 5.

CHAPTER V

DISCUSSION

Three preschool teachers completed the PDC-HS checklist to assess the barriers to accurate implementation of error correction procedures when providing DTT instruction to preschool students with autism. The paraeducator's supervising teachers completed the PDC-HS, which indicated that variables related to training and consequences were likely barriers. A nonindicated intervention (task clarification and checklist) improved performance slightly for two participants, but the effects did not maintain. The indicated intervention, consisting of a BST package, was successful at increasing accurate performance for all of the paraprofessionals to at or above criterion. The findings of this study are in line with those from Carr et al. (2013) and Ditzian et al. (2014). The current study replicated the procedures of those two studies, and extended them in several ways.

First, the previous studies focused on highly trained professionals in controlled University-based clinics with a BCBA-level supervisor, and the supervisor completed the PDC-HS. This study focused on paraprofessionals in public school classrooms. Furthermore, the preschool teacher completed the PDC-HS. This study also expanded the current literature by applying the PDC-HS to a more complex behavior than previous studies. Here, we focused on performance issues related to managing consequences for error correction in discrete trial instruction. Specific guidelines need to be implemented correctly in order for DTT to be an effective teaching procedure that supports student learning (Smith, 2001). The PDC-HS was used to assess which area of (a) training; (b)

task clarification and prompting; (c) resources, materials, and processes; and (d) performance consequences, effort, and competition was influencing poor performance and then identity an intervention to improve the paraprofessionals skill to manage consequence for error correction. Although a social validity measure was not conducted with the paraprofessionals, one paraprofessional acknowledged that the student she was working with was not able to master a receptive identification target of “spoon” until the paraprofessional was provided the indicated intervention of BST. Once the paraprofessional completed all steps correctly the student was able to master the target.

This study also compared the effects of a PDC-HS nonindicated and PDC-HS indicated intervention for all participants. The previous two studies implemented a nonindicated intervention to a subset of participants. Here, applying the nonindicated intervention to all participants increased the demonstration of experimental control across baseline, nonindicated, and indicated interventions. The non-indicated intervention was selected from the PDC-HS intervention sample guide after the results of the PDC-HS were analyzed. A checklist describing the steps to manage the consequences of an error in discrete trial instruction was selected to implement in all classrooms because this area scored low across all classrooms and it is something teachers typically rely on as the primary component to quickly train paraprofessionals. Implementing the same nonindicated intervention across all classrooms allowed for a more systematic analysis of the results of both the nonindicated and indicated interventions. The classroom work areas contained either no checklist or an inaccurate checklist that did not include all steps of the procedure or provide a definition of what constituted an error. The implementation

of the checklist demonstrated some improvement across all participants but not to the level of criterion required to effectively complete the procedure and it was not maintained.

The checklist may have been ineffective because the participants failed to consistently refer to it. Another possibility is that the participants misinterpreted some of the steps because a definition was not provided for all steps. The drop in performance could also have been the result of teachers not maintaining supervision once a change is observed in performance. Frequently teachers implement an intervention aimed at changing staff performance and observe until staff appear to be implementing the changes. Staff observation usually terminates once the change is noted. Employees' performance may worsen due to skill drift or short-term observer effects. The results in the current study demonstrated that, although the nonindicated intervention did improve performance for three of the employees, the performance change did not meet criteria and was not maintained.

Forbush and Morgan (2003) identified the time required to provide professional development and training can be a challenge for teachers. The current study did not track or compare the amount of time necessary to identify the function of substandard performance and subsequently identify, prepare and implement an intervention to improve employee performance to desired results. As one of the proposed strengths of the PDC-HS, future research could study the time required between identified PDC-HS interventions and what the teacher traditionally does to correct substandard performance.

A limitation of the study is that other nonindicated interventions were not

assessed and may have been effective at increasing performance. The area of resources, materials, and process also received a low number of *no* responses and could have been considered an area from which to select a nonindicated intervention. One teacher noted in this area that she felt her data collection sheets were difficult to access and use during DTT. Although the indicated intervention in this study may have slightly improved processes, it would not have corrected the paraprofessionals' overall skill in managing the consequences of error correction. The checklist was identified as a nonindicated intervention due to a low number of *no* responses and seemed the most likely nonindicated intervention to address this performance problem. The area of performance consequences, effort and competition could have also improved performance, but it was the next area after training to receive the most *no* responses and would have competed as an indicated intervention.

Some questions on the PDC-HS were subjective in relation to DTT. For example, in "Performance consequences, Effort, and Competition" question 4 states "Is the task simple or does it involve relatively low response effort?" One teacher that was new to DTT responded *no* while the other two teachers that had at least four years of experience responded *yes.* A teacher new to DTT may not be familiar with what might constitute "other potentially competing tasks" for question 5 in this same area. It may be possible that future use by special education teachers with a range of background experience with DTT could have varying results.

Another limitation was managing student problem behavior during DTT. Question 5 on the PDC-HS inquires if the task takes precedence over other potentially

competing tasks. All teachers responded *no* and referred to behavior management. Data were not collected on problem behavior as it was not the purpose of the study. It can be difficult for a paraprofessional to manage problem behavior while being observed. The combination of being observed and managing problem behavior could have contributed to poor performance.

In conclusion, these findings support past research, and extend the current literature base to a different class of human service providers and a more complex behavior. The results suggesting that the PDC-HS is a useful tool for assessing staff performance problems in treatment centers and public school settings. This research may increase the capacity of the special education teacher to supervise and train paraeducator performance with a systematic approach that may save time by identifying the most appropriate intervention to correct performance issues. In addition, well-trained paraeducators implementing instructional procedures with a high degree of fidelity may result in improved student performance.

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APPENDICES

Appendix A

Treatment Integrity for Definition Prompt

Treatment Integrity for Definition Prompt

Participant:	**Date:**	**Session #:**	**Primary IOA** *(Circle One)*
Data Collector Name:			

Component	**Y=Yes N=No**
Was the employee individually given a verbal prompt on the definition of what a student error is?	Y N
Was the discrete trial procedure checklist posted in view (no obstructions) in the area in which discrete trials are performed?	Y N
Was a definition of a student error highlighted on the discrete trial procedure checklist? *Error= giving wrong answer either verbally or pointing, needing to give direction more than once, giving any hints through body language (smiles, nodding head)*	Y N
Was the employee told to not mention the checklist highlight to anyone else?	Y N
	/4
% of correctly implemented steps divide the # of correctly implemented steps by total # of steps	

Appendix B

Checklist for Nonindicated Intervention

Error Correction Procedure

(Error = giving wrong answer either verbally or pointing, needing to give direction more than once, giving any hints through body language (smiles, nodding head)

1. Block gently, remove materials, look down (2-3 seconds)
2. Record incorrect response
3. Secure child's attention
4. Re-present the materials
5. Re-present the instruction with prompts to guarantee correct response
6. Give praise only
7. Record error correction
8. Have brief inter-trial interval (3-5 seconds)

Appendix C

Treatment Integrity for Behavior Skills Training on Managing Consequences for an Incorrect Response in Discrete Trial Instruction

Treatment Integrity for Behavior Skills Training on

Managing Consequences for an Incorrect Response in Discrete Trial Instruction

Participant:	**Date:**	**Session #:**	**Primary IOA** *(Circle One)*
Data Collector Name:			

Component	**Y=Yes N=No**
Was the para given a copy of the procedures for managing consequences for incorrect responses during discrete trial instruction?	Y N
Was each step of the procedures defined?	Y N
Was the para given an opportunity to ask questions regarding the steps?	Y N
Did the para observe the teacher and a trained para demonstrate how to manage consequences of error correction? At least twice for each scenario of no response and an incorrect response.	Y N
Was the para given an opportunity to ask questions regarding the steps after the observation?	Y N
Did the para rehearse with another adult the steps of managing consequences for an incorrect response?	Y N
Was the para given feedback after each trial on which critical items on the list they did not complete correctly?	Y N
Was the para retaught procedures that she did not complete correctly during rehearsal?	Y N
Did the para complete at least 5 opportunities with a total of 90% or better during rehearsal?	Y N
	/9
% of correctly implemented steps divide the # of correctly implemented steps by total # of steps	

Appendix D

Social Validity Measure

Social Validity Measure

Name:

Please indicate the extent to which you agree or disagree with the following statements regarding the PDC-HS by circling a number that most closely reflects your opinion.

Strongly Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Strongly Agree
1	2	3	4	5

1. The PDC-HS is easy to use.
   1 2 3 4 5
2. I will use the PDC-HS in the future.
   1 2 3 4 5
3. Before using the PDC-HS I was confident in addressing staff performance problems.
   1 2 3 4 5
4. After using the PDC-HS I am confident in addressing staff performance problems.
   1 2 3 4 5
5. The time requirements of using the PDC-HS are reasonable.
   1 2 3 4 5
6. The PDC-HS is easily incorporated into my performance evaluation systems.
   1 2 3 4 5
7. Overall, the PDC-HS is an effective tool to identify and improve paraeducator's delivery of discrete trial instruction.
   1 2 3 4 5
8. I would recommend the PDC-HS to other educators.
   1 2 3 4 5
9. I am satisfied with the outcomes of using the PDC-HS.
   1 2 3 4 5