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## The Effects of Pyramidal Training of Behavioral Skills Training on Staff Interactions With Students With Developmental Disabilities


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**THE EFFECTS OF PYRAMIDAL TRAINING OF BEHAVIORAL SKILLS  
TRAINING ON STAFF INTERACTIONS WITH STUDENTS WITH  
DEVELOPMENTAL DISABILITIES**

A Master's Thesis

Presented to

The Graduate College of

Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Applied Behavior Analysis

By

Mallory Eoff

May 2022

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DISABILITIES**

Psychology

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**ABSTRACT**

Well-trained staff are critical for quality care in human service settings, but training requires resources that are often unavailable or restricted. This results in staff with inadequate training and worse outcomes for those in their care. Behavioral Skills Training (BST) is an effective training strategy with empirical support. The current study implemented a pyramidal training procedure with BST to train staff to increase staff use of positive interactions and behavior-specific praise statements when working with children with developmental disabilities in a public-school setting. Instruction, modeling, practice, and feedback were used to teach lead classroom teachers and their paraprofessionals how to interact positively and use behavior specific praise. Lead teachers were trained by the experimenter to train their paraprofessionals to interact positively and use behavior specific praise with students in a special education classroom. An AB experimental design was used to assess the effectiveness of the pyramidal training program. Participants increased positive interactions and/or behavior specific praise statements as a result of the pyramidal training program.

**KEYWORDS:** staff, training, pyramidal training, peer training, behavioral skills training, developmental disabilities, behavior-specific praise, positive interaction

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In the interest of academic freedom and the principle of free speech, approval of this thesis indicates the format is acceptable and meets the academic criteria for the discipline as determined by the faculty that constitute the thesis committee. The content and views expressed in this thesis are those of the student-scholar and are not endorsed by Missouri State University, its Graduate College, or its employees

## TABLE OF CONTENTS

Introduction	1
Literature Review	2
Methods	8
Participants	8
Setting	9
Dependent Variables	9
Data Collection System	10
Experimental Design	11
Baseline	11
Peer Trainer Instruction	11
Stage 1: Training of Responses	12
Stage 2: Train-the-Trainer I	12
Stage 3: Train-the-Trainer II	13
Training Response	13
Booster Feedback Sessions	14
Generalization	14
Inter-Observer Agreement	14
Results	16
Discussion	21
Limitations	22
Summary	25
References	27
Appendices	40
Appendix A. IRB Approval Certificate	40
Appendix B. BST Checklist, Stage 2	41
Appendix C. BST Checklist, Stage 3	41

## LIST OF TABLES

Table 1. Examples and Nonexamples of a Positive Interaction	29
Table 2. Examples and Nonexamples of Behavior Specific Praise	30
Table 3. Training of Responses	31

## LIST OF FIGURES

Figure 1. Participant 1	33
Figure 2. Participant 2	34
Figure 3. Participant 3	35
Figure 4. Participant 4	36
Figure 5. Participant 5	37
Figure 6. Participant 6	38
Figure 7. Participant 7	39

## INTRODUCTION

Many special education teachers and paraprofessionals report feeling unequipped to support students with behavioral needs (Royer et al., 2019). Teachers are often trained by consultants hired by the school district who then leave (Demchak et al., 1992). With this training model, teachers are left without a training expert to consult with should questions arise after initial training. Due to a consistent shortage of highly qualified special education teachers, an amendment to the Individuals with Disabilities Act (IDEA) in 1997 mandated that school districts hire paraprofessionals to assist in the educational process (Zobell and Hwang 2020). Zobell and Hwang (2020) defined paraprofessionals as “school personnel who provide instruction or other direct services to children under supervision of teachers or licensed professionals” (p. 2). Legislation such as No Child Left Behind (2002) and Every Student Succeeds act (2015) mandate that all children should receive an education from a highly qualified team regardless of their disabilities.



## LITERATURE REVIEW

The Individuals with Disabilities Act (IDEA) (2004) requires that paraprofessionals are trained according to state standards and supervised by qualified personnel. However, IDEA (2004) does not provide specific criteria of training or supervision. State legislators and local education agencies are responsible for determining the criteria. According to the US Department of Education (2017), there were 415,000 paraprofessionals employed in school districts in the year 2014 and 340,000 special education teachers. For every seven special education teachers, there were eight paraprofessionals. Many paraprofessionals receive little professional training to best support the students they are working with (Lerman et al. 2019; Zobell and Hwang, 2020). According to Lerman et al. (2019), the lack of paraprofessional training is likely due to the considerable cost of training. Secondly, there is a lack of qualified trainers in most schools and there is often not enough time in a school day for training. School districts often expect teachers to train and supervise the paraprofessionals that are assigned to their classroom. However, teachers are rarely trained on how to provide effective training to paraprofessionals (Lerman et al. 2019; Zobell and Hwang 2020). The lack of training can lead to high turnover rates of paraprofessionals. It also negatively affects program integrity as many of the direct care staff working with students are not professionally trained to implement research-based academic and behavioral strategies.

There is demand for well-trained, highly qualified special education teachers and paraprofessionals in public school settings. However, there is little research on how school districts can maintain well-trained, highly qualified staff given their budget restraints and lack of in-district trainers. Pyramidal training is a training approach that avoids the previously stated

pitfalls in school districts (Demcheck et al. 1992; Pence et al. 2014). Pyramidal training, or peer to-peer training, is a training model that involves professional direct training of lead staff members who then train other staff members. In a pyramidal training model, an expert trainer trains lead staff members in a specific skill. Once the lead staff members have reached mastery criterion, they train their staff assistants who work closely with them. This training model has been used to train teachers to implement behavior analytical skills (Maffei-Almodovar and Sturme y 2018), direct care staff at community day programs about the principles of ABA and feedback techniques (Haberlin et al. 2012) paraprofessionals to implement discrete trial training (DTT) (Lerman et al. 2019), and assistant habilitation specialists to increase interactions and positive statements when working with individuals with dual diagnosis in a day habilitation center (Finn and Sturme y 2009). In a school setting, the expert trainer trains the lead classroom teachers on a specific skill. Once mastery is met, the lead teacher trains the paraprofessionals that work with their students. Further research on the effectiveness of pyramidal training in school districts would be beneficial. Pyramidal training can cut training costs, limit the amount of time it takes to train all staff members, and ensure there are qualified consultants in the district to support after the initial training (Finn and Sturme y 2009).

Haberlin et al. (2012), studied a comparison of pyramidal staff training and direct staff training in community-based day programs. Both groups were trained in implementing applied behavior analysis (ABA) principles with individuals with developmental disabilities. However, one group of participants was trained using a pyramidal training approach and a second group was trained using a direct staff training approach. In the pyramidal training group, the experimenter trained the supervisors at the day program in ABA principles and how to provide feedback to direct care staff. Supervisors then trained the direct care staff in ABA principles. In

the direct staff training group, the experimenter trained only the direct care staff in ABA principles. In this group, supervisors were not trained to provide training to their staff in ABA principles or how to correctly provide feedback. The experimenters studied the effects of the two training approaches (pyramidal and direct) on staff use of correct teaching procedures and staff knowledge of ABA principles. As a result of this study, the pyramidal training group demonstrated a greater mean percentage of correct teaching procedures in the post training and follow up conditions when compared to the direct training group. The direct training group's mean percentage of correct teaching procedures implemented was 45% accuracy during baseline. The pyramidal training group's mean baseline performance was 41% accuracy. In the follow up phase, the direct training group's mean percentage of correct teaching procedures implemented increased to 62% accuracy and the pyramidal training group increased 87% accuracy.

Previous research has demonstrated that when combined with behavioral skills training (BST), pyramidal training is an effective way to train others to implement a variety of behavioral procedures such as DTT, stimulus pairing, preference assessments, mand training, graphing data, and positive praise (Finn and Sturmey 2009; Lerman et al. 2019; Maffei-Almodovar and Sturmey 2018). BST is a training method that includes instruction, modeling, role play, observation, and performance feedback. Experiments have used BST in pyramidal training approaches by using BST to train lead staff and instructing lead staff to use BST components when training assistant staff. Behavior skills training is a highly effective training strategy that can be used to train paraprofessionals (Lerman et al. 2019) In a school setting, an expert trainer would train classroom teachers by providing instruction, modeling the skills, and allowing teachers to role play during training sessions. Next, the expert trainer would observe the teacher using the strategy in their natural classroom setting and provide feedback based on the

observation. Once the classroom teacher meets mastery, they become the trainer and begin training the paraprofessionals in their classroom using the same behavior skills training model of instruct, model, role-play, observe and provide feedback.

Lerman et al. (2019) used pyramidal training combined with behavior skills training to train paraprofessionals to implement discrete trial training with their students. The participants in this study were 16 teachers and 16 paraprofessionals who were enrolled in a summer training program. During baseline, trained observers observed the paraprofessionals' use of correct implementation of DTT components. The paraprofessionals' mean percentage of opportunities with correct DTT responses ranged from 28-77% accuracy. The experimenters used pyramidal training with a BST model to train lead teachers who then trained their paraprofessionals using the same BST model. The results demonstrated an increase in the paraprofessionals' mean percentage of opportunities with correct DTT responses to a range of 84-96% accuracy.

Pence et al. (2014) studied the effects of pyramidal training combined with BST to train trainees to conduct standard functional analysis conditions. A functional analysis is a manipulation of an individual's environment to test variables that reinforce target behaviors. Standard functional analysis conditions include attention, escape, tangible, and play. During each condition, antecedents and consequences are manipulated. During baseline, all trainees demonstrated moderate levels of fidelity conducting standard functional analysis conditions. After training, all but one trainee met mastery fidelity criteria. Mastery criteria was defined as above 90% procedural fidelity.

Finn and Sturmey (2009) used pyramidal training to increase staff interactions and positive statements with adults with dual diagnoses. The researchers used pyramidal training in combination with BST to train four direct care staff to use positive interactions and praise when

working with adults with dual diagnosis in a day habilitation program. The study resulted in an increase in frequency of interactions and increase in proportion of positive statements across all direct care staff with the introduction of a pyramidal training program using behavior skills training. Baseline frequency for positive interactions and praise ranged from 2-22 interactions per observation. Following training, frequency of positive interactions and praise by the direct care staff increased by 12%-49% per observation. Limitations of the study included lack of maintenance probes, lack of data assessing behavior change due to training, and a lack of measure of staff and client acceptability of the training. In addition, the study did not conduct generalization observations after training in less structured settings.

Similarly, positive interactions and positive praise statements have been used in school settings as a naturalistic, non-intrusive classroom management intervention in general education settings and special education settings (Sutherland et al. 2000). Special education settings provide specialized services to students with academic, emotional, and behavioral needs that are too significant to support in the general education setting (Grskovic et al. 2004; Schoger 2006). Teachers in special education settings often observe high frequencies of disruptive behaviors. Previous research has demonstrated a functional relationship between teacher praise and disruptive behaviors. Behavior-specific praise (BSP) has been cited to be the most effective form of positive praise (Sutherland et al. 2000). BSP is a Tier 1 strategy that teachers can use to reduce challenging behaviors. Research has demonstrated that praise is most effective when it is behavior specific. BSP is contingent on student behavior, specific, sincere, varied, and credible (Royer et al. 2019). However, research has found that teacher praise rarely fits BSP criteria. Sutherland et al. (2000) found that as little as 5% of teacher praise statements were behavior specific. Furthermore, research has found that staff members in special education settings often

use a lower rate of praise per hour (4.4 statements per hour) than general education settings (13.5 statements per hour) (Jenkins et al. 2015). BSP is an effective and non-intrusive intervention to reduce challenging behaviors in the classroom that many special education teachers are likely to observe.

The current study replicated and extended the work of Finn and Sturmey (2009) by examining the effects of pyramidal training using behavior skills training to increase paraprofessionals' frequency of positive interactions and behavior-specific praise statements in self-contained special education settings. To address limitations of the previous study, booster feedback sessions focused on interactions occurred as needed. Also, generalization probes were conducted in settings outside of the classroom (e.g., lunchroom, recess, art, music, physical education, computers).

## METHODS

### Participants

Three lead teachers (peer-trainers) and seven paraprofessionals (trainees) served as participants in the study. The lead teachers were special education classroom teachers working at elementary schools in a public school district in southwest Missouri. Lead teacher 1 was a 24-year-old Caucasian male with a bachelor's degree in special education who had been employed with the district for approximately one year. Lead teacher 2 was a 29-year-old Caucasian female with a bachelor's degree in special education who had been employed with the school district for two years. Lead teacher 3 was a 27-year-old Caucasian female with a bachelor's degree in special education who had been employed with the school district for four years.

The seven female paraprofessionals were assigned to the three lead teachers' classrooms and were trained by their respective lead teachers. Participants 1 – 4 were Caucasian females with ages ranging 28-43 years-old who worked in the district for approximately one year. Participants 5 and 6 were Caucasian females ages 32 and 37 who worked in the district for two years. Participant 7 was a 41-year-old Caucasian female who worked in the school district as a paraprofessional for four years. All participants met the state's criteria to be employed as paraprofessionals. Participants 1, 2, 5, and 6 completed a minimum of 60 college credit hours, passed a background check, and obtained a substitute teacher certificate. Participants 3 and 7 completed a minimum of 60 college credit hours and passed a background check.

A behavior technician was trained by the experimenter to collect interobserver agreement (IOA) data during observation sessions with the participants. The behavior technician had been employed by the school district in her current role for two years. Previously, she was a

paraprofessional in the district for 5 years. The training took place during the regular school day.

## **Setting**

The study took place in a public school district in southwest Missouri. All lead teachers and paraprofessionals worked with students in self-contained special education classrooms within the elementary (kindergarten to 5th-grade) buildings. Each classroom served a range of 5 to 10 students. Students had educational diagnoses and qualified under Missouri's eligibility criteria to receive special education services. Each student had an individualized education program (IEP) to meet their academic and behavioral needs in the school setting. Each classroom was assigned at least two paraprofessionals. The highest number of paraprofessionals assigned in one classroom was three.

Students transition out of the special education setting to general education classrooms for durations specified by their IEP. Students attended music, physical education, art, computers, and library classes in the general education setting. In these settings, paraprofessionals support students' academic and behavioral needs as needed. regular education peers were present in the general education setting. Students attended lunch and recess in the general education setting with paraprofessional support.

## **Dependent Variables**

The two responses targeted for increase in this study were positive interactions and behavior-specific praise. A positive interaction was defined as any verbalization, manual signing, or gesture of communication a paraprofessional made to a student or group of students that



expressed approval to the student. This included general statements of praise (e.g., “good job”), general compliments directed towards a student (e.g., “I like your shirt today”), or an indication that a student’s work and/or performance was correct (e.g., “that is correct”). Positive interactions also included positive physical responses involving a student, including shaking a student’s hand, giving them a high-five, and/or a pat on the back. Repeating the same words as a student, verbally saying “okay,” and demands placed on the student were excluded. Table 1 shows examples and non-examples of positive interactions that could occur in the classroom setting. Behavior-specific praise was defined as verbal praise or approval from a paraprofessional that identified a specific behavior of a student or group of students. Since behavior-specific praise was a positive interaction, it was recorded as both a positive interaction and behavior-specific praise statement. Repeating the same words as a student, verbally saying “okay”, and demands placed on the student were excluded. Table 2 provides examples and non-examples of behavior-specific praise.

### **Data Collection System**

The experimenter and a behavior technician conducted all observations during the study. The experimenter trained the behavior technician in the target responses. The experimenter and behavior technician completed practice observations with data collection until interobserver agreement (IOA) reached 90% or higher for two consecutive observations. Observations took place when paraprofessionals were engaged in structured instructional activities with students. Observations were 20 minutes in duration. Positive interactions and behavior-specific praise statements were recorded using partial interval recording. Data were collected simultaneously and continuously for 20, 1-minute intervals using a cellphone for timing and pencils/pens and a

paper data sheet for recording. Observation sessions lasted 20 minutes and occurred 2-3 times a week. Prior to the start of data collection, the institutional review board (IRB) reviewed and approved the proposed study. IRB-FY2021-436 was approved on January 29<sup>th</sup>, 2021 (See Appendix A).

### **Experimental Design**

An AB experimental design was used to demonstrate the relationship between peer-to-peer training and the frequency of positive interactions and behavior-specific praise statements. The independent variable was introduced to all lead teachers during a district scheduled monthly professional development meeting. Following their training, the lead teachers conducted training with their paraprofessionals during a district scheduled monthly professional development meeting.

### **Baseline**

During baseline, the experimenter recorded each participant's use of positive interactions and behavior-specific praise statements during structured activities. A partial interval recording measure with 20, one-minute intervals was used. Each baseline observation lasted 20 minutes.

### **Peer Trainer Instruction**

The experimenter trained each lead teacher (peer trainers) to teach their paraprofessionals (trainees) the target responses. Training sessions were held in a group format during a typical workday. The lead teachers all completed three stages of training (below) with the experimenter and then trained each of the paraprofessionals in all three stages.

### **Stage 1: Training of Responses**

During the first stage of peer trainer instruction, the experimenter observed the lead teachers working with students in their classroom and collected baseline data on positive interactions and behavior-specific praise statements. The data were given to each lead teacher verbally and graphed. The experimenter then conducted a training session with the lead teachers. The experimenter used a classroom to conduct a training session that included modeling of the responses, observations, and feedback. The training session was 15 minutes in duration. During the training session, the experimenter (a) introduced the target responses and their operational definitions; (b) provided the rationale for the importance of emitting the target response; (c) discussed ways to use target responses during the school day; (d) stated what the lead teacher's mean performance was during the pre-training observation session; and (e) explained the criteria for mastery (See Table 3).

### **Stage 2: Train-the-Trainer I**

The experimenter completed a training session with the lead teacher to teach the behavior skills training method. A behavior skills checklist was provided to the lead teacher that listed each step to follow when training their paraprofessional(s) on the target responses (Appendix B). The steps included introducing the topic, rationale, and response definitions, providing suggestions on using responses during the day, asking if there are any questions, discussing baseline performance with each paraprofessional, discussing criterion for mastery, modeling the responses, and thanking the paraprofessionals.

### **Stage 3: Train-the-Trainer II**

During training, the experimenter reviewed the operational definitions of positive interactions and behavior specific praise, described the format of observation sessions, and explained how data would be collected. The lead teacher was given a second behavior checklist that included the two steps for observing the participants: observing peers and delivering feedback. The behavior checklist also included the steps for delivering feedback. The steps included making one positive statement about the observation, making specific suggestions as to how the participant could increase response rate, asking if they have any questions, and thanking the participant (Appendix C). The experimenter then modeled the steps of the behavior checklist with the behavior technician. After modeling was complete, the peer trainers practiced providing feedback using the behavior checklist with a second peer trainer in the group.

### **Training Response**

After the lead teacher completed all three stages of the Peer Trainer Instruction, the lead teachers trained their participant(s) (paraprofessionals) to increase positive interactions and behavior-specific praise statements when working with their students using the behavior checklists provided during Stage 2 and Stage 3 of peer training. Following the training completed by the lead-teacher, the experimenter completed observations of the participants and recorded their use of positive interactions and behavior-specific praise statements. The experimenter was not present during the training with the participants. To ensure the training was completed with fidelity, the lead teachers completed the checklist and made any notes of tasks on the list that were not completed. Lead teachers signed the checklist and returned it to the experimenter after the study was completed.

### **Booster Feedback Sessions**

Booster feedback sessions occurred for participants who did not increase their use of positive interaction and/or behavior-specific praise by 20% or more. The sessions consisted of 5-minute re-training sessions along with performance feedback. The experimenter provided the operational definition of positive interaction and/or behavior specific praise and modeled each response for the participants. Following modeling, the paraprofessional completed two practice opportunities with the experimenter.

### **Generalization**

Generalization probes occurred after demonstration of consistent use of the responses in the special education setting. For positive interactions, generalization probes were completed when a paraprofessional engaged in positive interactions 100% over mean baseline performance or engaged in at least 10 interactions per 20-minute observation session for two consecutive observation sessions. For behavior specific praise, generalization probes occurred when a paraprofessional engaged in behavior specific praise 100% of mean baseline performance or engaged in at least 6 instances of behavior specific praise for two consecutive observation sessions. Generalization probes were collected in settings outside the special education classrooms where students were integrated with their regular education peers. Settings included music, computers, and physical education. Generalization observations were 20 minutes in duration (20, 1-minute intervals) and data was collected using partial interval recording.

### **Inter-Observer Agreement**

The experimenter conducted IOA observations with a behavior technician who worked in

the school district. IOA checks occurred during at least 33% of observations. IOA was assessed on an interval-by-interval basis. The experimenter calculated IOA by dividing the total number of agreements by the number of agreements plus disagreements and multiplying by 100%. An agreement was scored when both observers recorded an occurrence of the target response or a non-occurrence of a target response in a 1-minute interval.

## RESULTS

Three pre-training observations of the lead teachers (peer-trainers) were completed in their classrooms. Data was collected on their use of positive interactions and behavior specific praise. The data provided to the lead teachers at the start of train-the-trainer training. Lead-teacher 1 used positive interactions during 50%-60% of observation interval. He used behavior-specific praise during 55%-65% of intervals. Lead teacher 2 engaged in positive interactions during 45%-55% of intervals. She used behavior specific praise during 55%-67% of intervals. Lead teacher 3 used positive interactions during 45%-60% of intervals. She used behavior specific praise during 45%-58% of intervals. This data was used to demonstrate how data would be visually represented for the participants (paraprofessionals) and to demonstrate how to verbally provide feedback to the participants.

Data for Participant (paraprofessional) 1 are in Figure 1. During baseline, the average percentage of intervals in which a positive interaction occurred was 55% (45%-70%) of intervals. Data during baseline were variable. After training, the percentage of intervals in which a positive interaction occurred was 59% (50%-65%) of intervals. An increasing trend was evident in the post-training data. The average percent of behavior-specific praise statements during baseline was 18% (15%-20%) of intervals. Data was at a consistent level between 15%-20% during baseline observations. The average percentage of intervals in which behavior-specific praise occurred increased from 18% (15%-20%) of intervals to 45% (35%-50%) of intervals following the peer training. An increasing trend was also evident in the participant's use of behavior specific praise during post-training observations. A generalization probe for participant 1 was conducted in music class. Subsequent use of positive interactions and behavior-

specific praise in music class was consistent with the special education setting.

Data for Participant (paraprofessional) 2 are in Figure 2. During baseline, Participant 2 engaged in a positive interaction during an average of 20% (15%-25%) of intervals. A slight increasing trend was present during baseline. Frequency of positive interactions increased by 5% each observation. There was an increase in positive interactions after training. After training, participant 2 engaged in positive interactions in an average of 58% (55%-60%) of intervals. The level of responding remained consistent in the post-training phase. The average percentage of intervals in which behavior-specific praise statements occurred was 0.016% (0%-5%) of intervals during baseline. The average percentage of behavior-specific praise statements increased to 26% (25%-30%) of intervals following the training. Data was consistent and remained at a medium level of responding for 3 consecutive observations in the post-training phase. The generalization probe for participant 2 was completed in computer class. Use of positive interactions decreased by 20% and use of behavior-specific praise decreased by 10%.

Data for Participant (paraprofessional) 3 are in Figure 3. During baseline, Participant 3 engaged in positive interactions during an average of 67% (50%-75%) of intervals. There was high variability in data during baseline. After training, the average percentage of intervals with a positive interaction was 68% (65%-70%) of intervals. Participant 3 engaged in positive interactions at a relatively high percentage during baseline and only increased 1% after training. However, after training variability in their use of positive interactions decreased when compared to baseline. The average percentage of intervals that included behavior-specific praise statements was 11% (5%-15%) during baseline. After training, Participant 3's average percentage of behavior-specific praise statements increased to 48% (40%-55%) of intervals.

Data for Participant (paraprofessional) 4 are in Figure 4. During baseline, Participant 4



had an average of 50% (35%-65%) of intervals where a positive interaction occurred. A decreasing trend was present during baseline for both positive interactions and behavior-specific praise. After training, an average of 60% (50%-65%) of intervals included a positive interaction. The average percentage of intervals in which behavior-specific praise statements occurred was 15% (10%-20%) during baseline. The participant's average percentage of intervals increased to 34% (30%-45%) after training. A booster feedback session was provided after the 3rd post-training observation. Following the booster feedback session, paraprofessional 4 increased her use positive interactions by 5% and her use of behavior-specific praise by 10%. An increasing trend in both positive interactions and behavior-specific praise occurred after the booster feedback session was conducted.

Data for Participant (paraprofessional) 5 are in Figure 5. During baseline, Participant 5 engaged in positive interactions during an average of 28% (15%-50%) of intervals observed. Positive interaction data variability was high during baseline. After training, the average percentage of intervals with a positive interaction increased to 58% (50%-65%) of intervals. A decreasing trend in data was present post-training. However, data remained at a high level above the baseline average. The average percentage of intervals that included behavior-specific praise was 3% (0%-5%) of intervals during baseline. The participant increased the use of behavior-specific praise to an average of 28% (25%-30%) of positive interaction intervals after the training sessions. A generalization probe was collected for participant 5 in the physical education class and use of positive interactions decreased by 10%. However, use of behavior-specific praise remained consistent with the special education setting

Data for Participant (paraprofessional) 6 are in Figure 6. During baseline, Participant 6 engaged in positive interactions during an average of 43% (30%-55%) of intervals. There was a

slight increase in positive interaction intervals after training and data was less variable when compared to baseline. After training, the average percentage of intervals in which a positive interaction was 60% (50%-65%) of intervals. The average percent of participant 6's behavior specific praise statements was 10% (5%-15%) of intervals during baseline. The participant's average percentage of behavior-specific praise statements was 28% (25%-30%) of intervals after the training sessions. A booster feedback session was conducted after the 3rd post-training observation. Following the booster feedback session, participant 6 increased positive interactions by 5%, but her use of behavior-specific praise did not increase.

Data for Participant (paraprofessional) 7 are in Figure 7. During baseline, Participant 7 engaged in positive interactions during an average of 40% (25%-50%) of intervals. There was an increase in positive interactions after training. After training, the average percentage of intervals in which a positive interaction occurred increased to 51% (45%-55%) of intervals. A slight increasing trend in positive interaction data was present in both baseline and intervention phases. The average percent of participant 7's behavior-specific praise statements was 5% (0%-10%) of intervals during baseline. The participant's average percentage of behavior-specific praise statements was 21% (20%-25%) of intervals after the training sessions. A booster feedback session was completed after the 2nd post-training observation. Participant 7 did not increase her frequency of positive interactions or behavior-specific praise.

Interobserver agreement between the experimenter and the behavior technician was collected during 38% of observations. IOA ranged from 85%-100%. For Participant 1, IOA ranged from 90%-100%. For participant 2, IOA ranged from 95-100%. For participant 3, IOA ranged from 95%-100%. For participant 4, IOA ranged from 95%-100%. For participant 5, IOA ranged from 85%-100%. For participant 6, IOA remained consistent at 100%. For participant 7,

IOA ranged from 90%-100%.

## DISCUSSION

Pyramidal training of behavioral skills training resulted in an increase in positive interactions and behavior-specific praise by all staff. Positive interactions increased from an average of 43.5% during baseline to 55.5% after the implementation of the training program. Behavior-specific praise increased from an average of 21% during baseline to 59% after the implementation of the training program. In many participants, variability in data also decreased with the implementation of the training program. Pyramidal training was an effective intervention for increasing participants' engagement in positive interactions and use of behavior-specific praise statements. These findings are consistent with those reported previously (Finn and Sturme, 2009).

The mean increase in behavior-specific praise was larger when compared to the mean increase in positive interactions. The mean responding of behavior specific praise for all participants increased by 30% when compared to baseline. Whereas the mean responding of positive interactions for all participants increased by 12% when compared to baseline. There was an overall increase in both positive interactions and behavior-specific praise statements as a result of the training. However, a more significant change was seen in the participant's use of behavior-specific praise. During baseline, behavior specific praise responses were at a low level for all participants. After implementation of pyramidal training of behavioral skill training, all participants increased their responding to a medium-high level of responding. During baseline, levels of responding for positive interactions were at a medium-high level for all participants. Participants 1, 3, 5, and 6 had variability in their responding during baseline. With the implementation of the training procedure, variability in responding decreased for all participants.

However, positive interaction responses remained at a medium-high level for all participants. Data for behavior-specific praise may be better visually represented as a proportion of positive interaction intervals that included behavior-specific praise statements. This would allow for the greater increase in behavior-specific praise when compared to increases in positive interactions to be visually represented in Figure 1.

## **Limitations**

Limitations identified in the previous study (Finn and Sturmey, 2009) were addressed by incorporating booster feedback sessions. A booster feedback session was completed with three of the participants (#4, #6, and #7). The feedback sessions occurred immediately following an observation and were conducted in the classroom or in the hallway outside of the classroom. Responding for all participants remained consistent with responding prior to feedback sessions or increased after the implementation of the booster feedback session. Participant 7 received a booster feedback session. However, she missed the following 3 days of work due to being ill. She was unable to implement the changes discussed during the feedback sessions immediately. Therefore, the feedback session may not have been effective. An additional session upon participant 7 arriving back to work may have been beneficial. In the future, multiple booster feedback sessions may be indicated for participants until satisfactory improvement is shown.

Generalization probes were collected for participant 1, 2, and 5. The generalization observation for participant 1 was conducted in music class. The participant sat beside the student she was assigned to. The student was a second-grade student who required frequent prompting to maintain focus on the whole group instruction and activities that were occurring. Positive interactions and behavior-specific praise occurred when the student engaged in activities such as

singing and hand motions with the group. Due to the support the student required in this setting, participant 1's use of positive interactions and behavior-specific praise remained consistent with the special education setting. The generalization observation for participants 2 occurred in computer class. Participant 2 supported 2 students who were in 3<sup>rd</sup> grade during the observation. The students wore headphones and were independent in completing the computer activity during 11/20 of observation intervals. During the feedback session, participant 2 verbally stated she felt it was difficult to frequently interact with the students because they were wearing headphones and she did not want to disrupt their learning and momentum towards the computer activity. Lastly, a generalization probe was collected for participant 5 in physical education class. The participant was assigned to support a 1<sup>st</sup> grade student during the observation. Group instruction from the PE coach occurred during 9 minutes of the observation. During group instruction, opportunities to interact with the student were limited.

Future studies should focus on additional generalization observations to determine if staff responses would remain consistent in settings outside of the special education classroom or over duration of time. It is difficult to determine if the responses generalized to the regular education setting with a limited number of probes. Future studies should also ensure that generalization probes are conducted for all participants. It is important to consider the environment when conducting generalization probes. Regular education environments may not allow for as many opportunities to interact with students as the small group structure that is found in the special education classroom, and therefore a decrease in responding rates may occur. Additionally, it is important to consider the support needs of the student the paraprofessional is assigned to. Regular education settings such as music, computers, and PE often have less rigorous demands and expectations than the special education classroom setting. Different students will interact in

regular education settings in a variety of ways and may be more independent in educational settings where less academic rigor is required. This could also limit the number of opportunities for the paraprofessional to interact with and provide behavior specific praise to the student. Additional research in generalization of positive interaction and behavior specific praise would be beneficial

While there was an increase in positive interactions and praise statements after training, the use of a simple A/B design somewhat limited the conclusions that can be drawn from the data. Teachers were only able to meet with their paraprofessionals one Friday each month. Data collection began during the second half of the school year and there were insufficient Fridays remaining to carry out the intervention using a staggered multiple baseline design. To allow enough time to provide all the training, the independent variable was introduced at the same time across all participants. Without staggering the treatment, internal validity is compromised somewhat. It is difficult to determine if the behavior change in participants was a result of the pyramidal training procedure or possible confounds that occurred coincidentally with the implementation of the training procedure. Possible confounds include information on positive interactions and behavior specific praise was provided during a district provided professional development training, paraprofessionals having previous training on the target behavior, and paraprofessional changing their behavior to be more positive because a new person (experimenter) was in the classroom.

In the future, the use of a staggered concurrent multiple baseline design across participants design would increase confidence in the findings and strengthen the conclusions to be drawn. A staggered multiple baseline design would allow a functional relationship between the pyramidal training procedure and increases in positive interactions and behavior specific praise.

It would limit the possibility that confounds are responsible for behavior change because it is unlike the confounds would repeatedly occur at the same time as intervention implementation. In addition, a multiple baseline design does not require withdrawal of intervention. Once training has been conducted, withdrawal of intervention could not occur.

Similarity, time and scheduling constraints resulted in a lack of maintenance probes. Due to required state-wide student testing and student/staff absences, limited generalization observations were completed. During the two-week, state-wide testing, classrooms did not run on their typical schedules and participants were assigned to a variety of other support positions around the school building. During this time, the participants did not interact with their students as they do during a typical school day. In addition to state-wide testing, summer break resulted in insufficient time to conduct maintenance probes. The school buildings close during summer and students and staff are not present. Future studies should include measures of maintenance after training is completed. If the trainees' skills are maintained, this would reduce the training burden that many school districts face.

Research in school settings must always contend with the limited amount of time available between winter and summer breaks to conduct studies. In general, commencement of data collection earlier in the school year (August/September) would allow enough time for the introduction of the treatment in a staggered fashion across participants. This would also provide sufficient time to test for generalization to other settings and for maintenance probes one month after the end of treatment.

## **Summary**

Despite these limitations, the preliminary results in this study tentatively support the use



of pyramidal training to increase efficiency of behavioral skills training in school settings. High-quality training of paraprofessionals is of utmost importance to ensure they possess the necessary skills to support their students. Pyramidal training allows school district staff to train lead teachers, who can then train their paraprofessionals effectively. Oftentimes, budget and time constraints limit training opportunities for school district staff. Peer-to-peer training may be an effective training alternative to traditional training programs that rely on professional trainers. This approach may decrease high paraprofessional turnover rates and increase program integrity in special education settings.

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## TABLES

Table 1. Examples and Nonexamples of a Postive Interaction

Positive Interaction Examples	Positive Interaction Nonexamples
“I like your shirt today!”	“Okay”
Says “Nice Job!: and pats the student on the back	Repeating what a student said
“Good morning!”	“Go lineup”
“That is correct.”	“You need to show my you are ready to work.”
“You did great”	Any academic Instruction from a teacher or paraprofessional.
Plays with a student	Pointing to a spot on the carpet where the student needs to sit down
Initiate conversation with a student about a preferred topic	Hand movement indicating the student to come here
Waves to a student	“Sit down please”
Gives a thumbs up	“Look over here”
“Thanks!”	“Wait”
Responds “yes” when a student complies with a given directive	“No”
Responds to student about a preferred topic	Responding “yes” to a student’s request to complete a task

Note. This table provides examples and nonexamples of positive interactions. Academic instruction and directives are not considered positive interactions

Table 2. Examples and Nonexamples of Behavior Specific Praise

Behavior Specific Praise Examples	Behavior Specific Praise Nonexamples
“I love the way you are sitting in your chair.”	Repeats what a student says
“You’re walking in the hallway, nice job!”	Gives a student a thumbs up.
“Good job asking for help!”	“Good job!”
“3X3=9. That is correct!”	“That is correct!”
“Nice job keeping your hands in your lap.”	“You’re doing it!”
“You did an awesome job raising your hand.”	“You did awesome.”
“You read the word ‘dog’, great job!”	“Okay.”
“Sam, you are sharing your toys with Billy. Great job being a kind friend!”	“You’re so kind!”
“Good job saying focused for your science test, your effort really paid off!”	“You’re a natural born leader!”
“Thanks for being a great leader by helping clean up the classroom without being asked.”	Initiates conversation with a student about a preferred topic.
“You’re using an inside voice, that perfect!”	Waves to a student
“You came into the classroom and got your notebook out all by yourself/ Here’s a ____ (any token reinforcer).”	“Thanks”
	“I love it!”
	“Go line up!”
	“Yes, that is right!”

Note. This table provides examples and nonexamples of behavior specific praise. There must be a specific behavior stated to be recorded as behavior specific praise. If there is a praise statement but no specific behavior stated, it is recorded as a positive interaction.

Table 3. Training of Responses

Training Objective	Description of Training Objective
<p>Introduce the target response and their operational definition.</p>	<p>A positive interaction is defined as any verbalization, manual signing, or gesture of communications a paraprofessional made to a student or group of students that expresses approval to the student. This included general statements of praise (e.g., “good job”), general compliments directed towards a student (e.g., “I like your shirt today”), or an indication that a student’s work and/or performance was correct (e.g., “that is correct”). Positive interactions also include positive physical responses involving a student including shaking a student’s hand, giving them a high five, or giving a pat on the back. Repeating the same words as a student and verbally saying “okay” were excluded.</p> <p>Behavior specific praise is defined as verbal praise or approval from a paraprofessional that identifies a specific behavior of a student or group of students. Repeating the same words as a student, verbally saying “okay”, and demands placed on the student will be excluded.</p>
<p>Provide rationale for the importance of emitting the target response</p>	<p>Positive interactions are a non-intrusive classroom management strategy that can decrease problem behaviors.</p> <p>Research has shown that behavior specific praise is the most effective form of positive interactions. Behavior specific praise is a research-based strategy used to increase desired behaviors</p>
<p>Discuss ways to use positive interactions and behavior specific praise during the school day.</p>	<p>Say “Hi” to students when they enter the classroom, complement students, give high fives and thumbs up, provide behavior specific praise or expected behaviors throughout the day such as sitting quietly, shaving safe hands, staying with adults, etc.</p>

Table 3 continued.

Training Objective	Description of Training Objective
State the number of sessions data was collected. Provide each teacher with their mean performance.	<p data-bbox="829 384 1403 527">Positive interactions: 100% over baseline performance or at least 10 interactions per 20-minute observation session for two consecutive observation sessions</p> <p data-bbox="829 569 1403 709">Behavior specific praise: 100% over mean performance or at least 6 instances of behavior specific praise for two consecutive observation sessions</p>
State what the participant’s mean performance was during the pre-training observation session	State number of sessions data was collected. Provide each teacher with their mean performance
Explain the criteria for mastery	<p data-bbox="829 1014 1403 1157">Positive interactions: 100% over baseline performance or at least 10 interactions per 20-minute observation session for two consecutive observation sessions</p> <p data-bbox="829 1199 1403 1339">Behavior specific praise: 100% over mean performance or at least 6 instances of behavior specific praise for two consecutive observation sessions</p>

Note. This table explains the learning objectives for the training responses phase of training. This phase of training was completed by the experimenter with the lead teachers. Following lead teacher completion of the training, this phase was completed by the lead teachers with their paraprofessionals.

## FIGURES

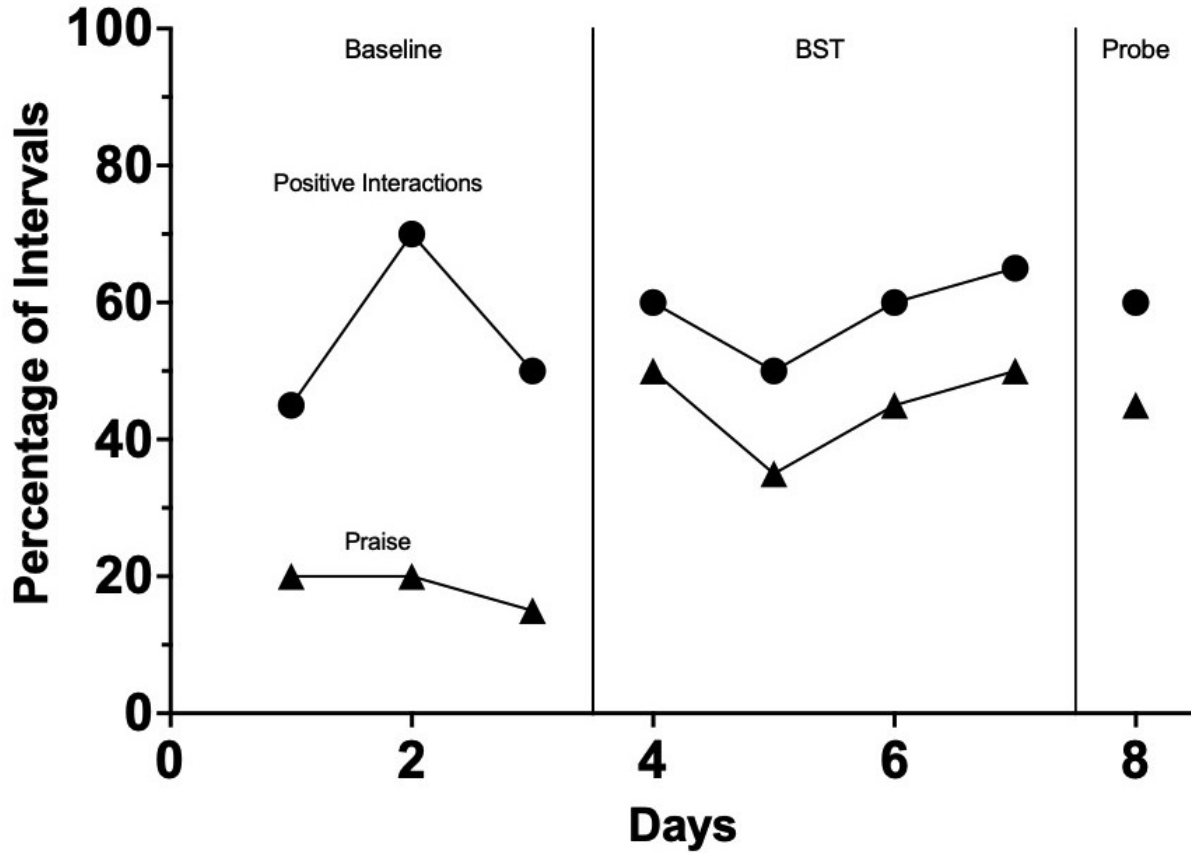


Figure 1. Participant 1's use of positive interactions and behavior-specific praise statements. Percentage of intervals is represented on the ordinate (y-axis) and days are represented on the abscissa (x-axis). Positive interactions are denoted with solid circles and behavior-specific praise is denoted by open triangles



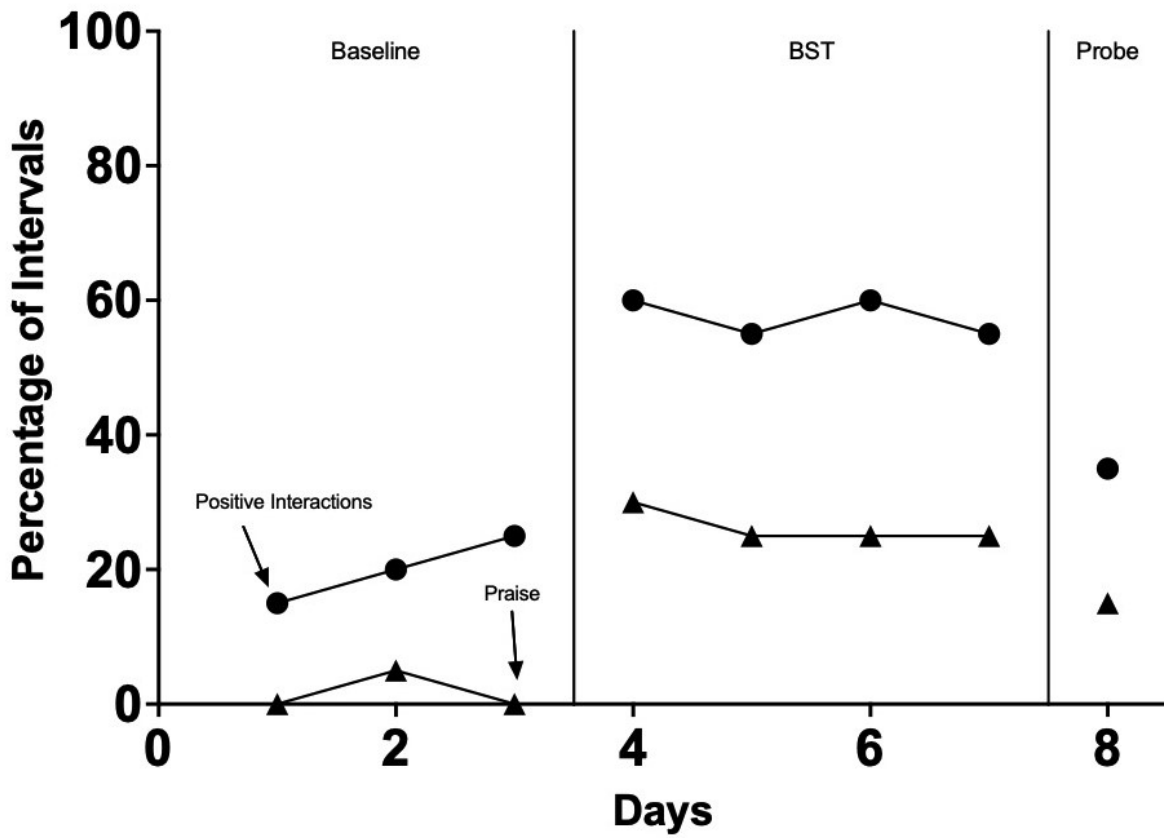


Figure 2. Participant 2's use of positive interactions and behavior-specific praise statements. Percentage of intervals is represented on the ordinate (y-axis) and days are represented on the abscissa (x-axis). Positive interactions are denoted with solid circles and behavior-specific praise is denoted by open triangles.

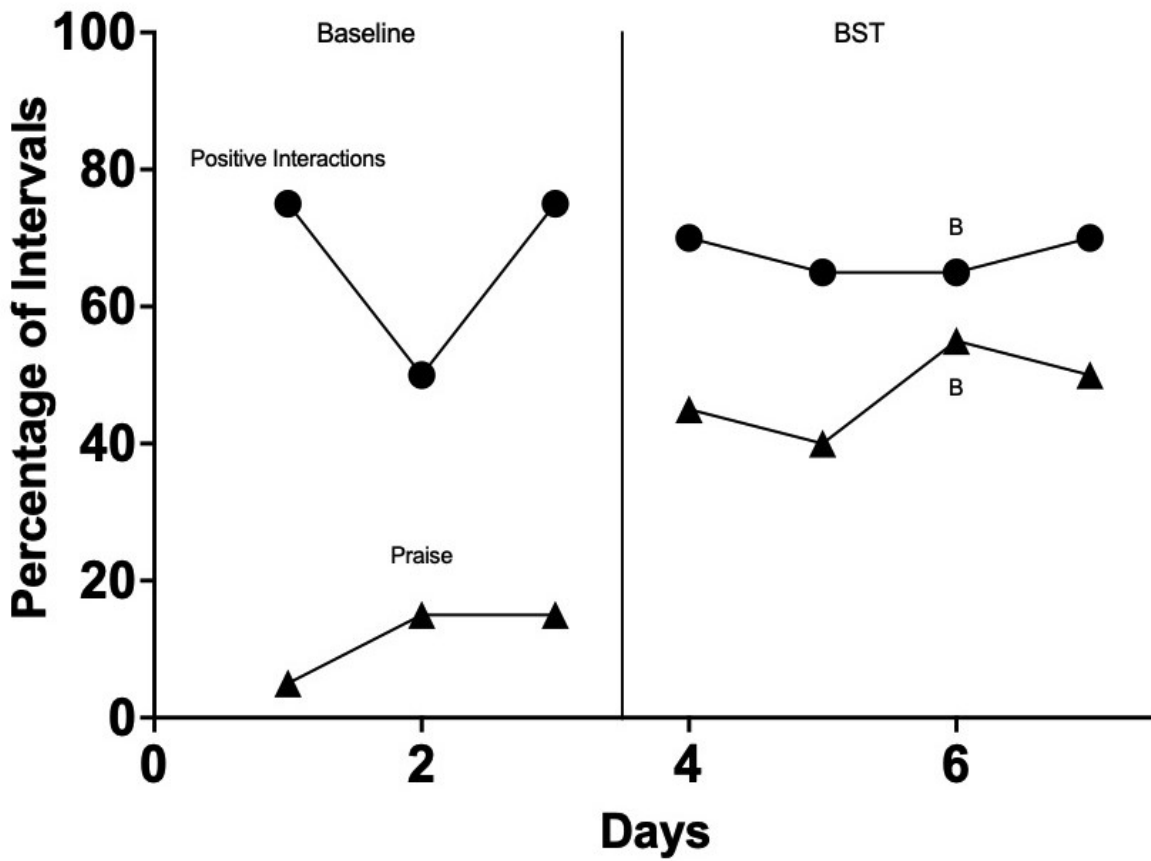


Figure 3. Participant 3's use of positive interactions and behavior-specific praise statements. Percentage of intervals is represented on the ordinate (y-axis) and days are represented on the abscissa (x-axis). Positive interactions are denoted with solid circles and behavior-specific praise is denoted by open triangles. Booster feedback sessions are denoted with "B".

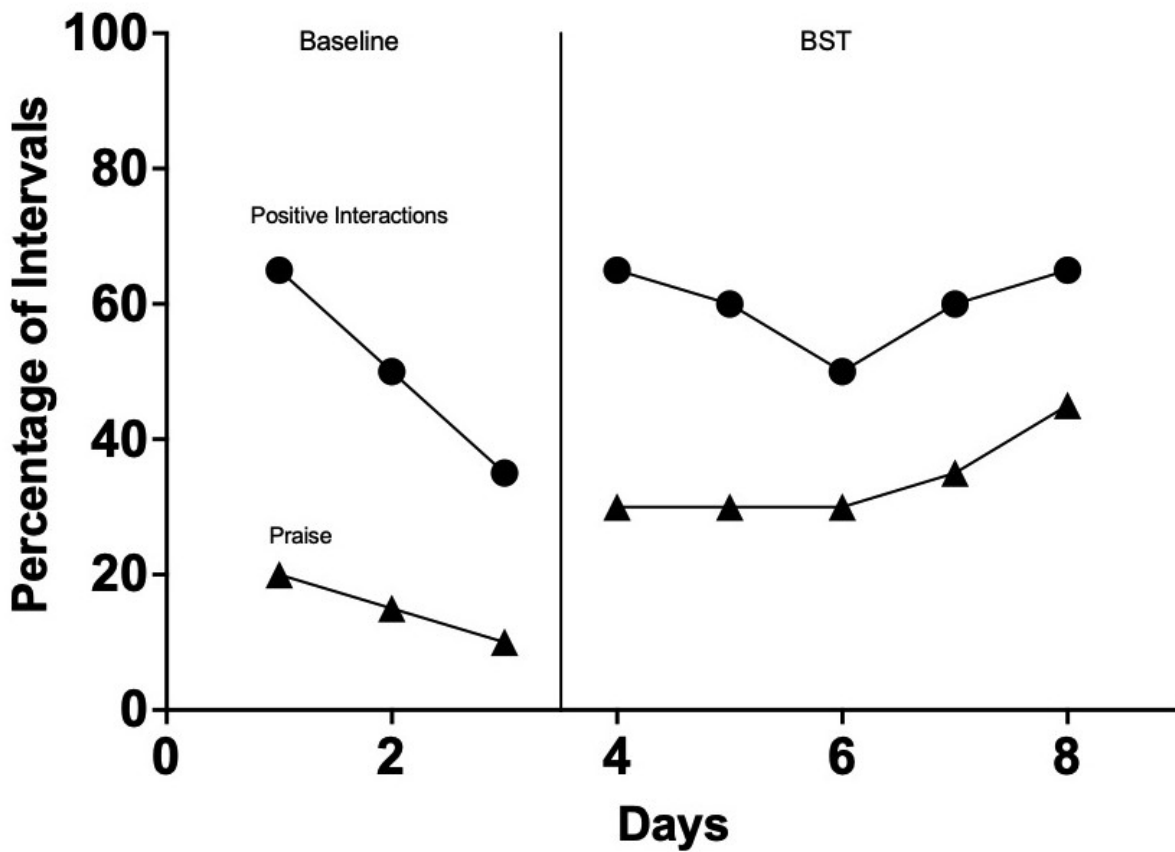


Figure 4. Participant 4's use of positive interactions and behavior-specific praise statements. Percentage of intervals is represented on the ordinate (y-axis) and days are represented on the abscissa (x-axis). Positive interactions are denoted with solid circles and behavior-specific praise is denoted by open triangles.

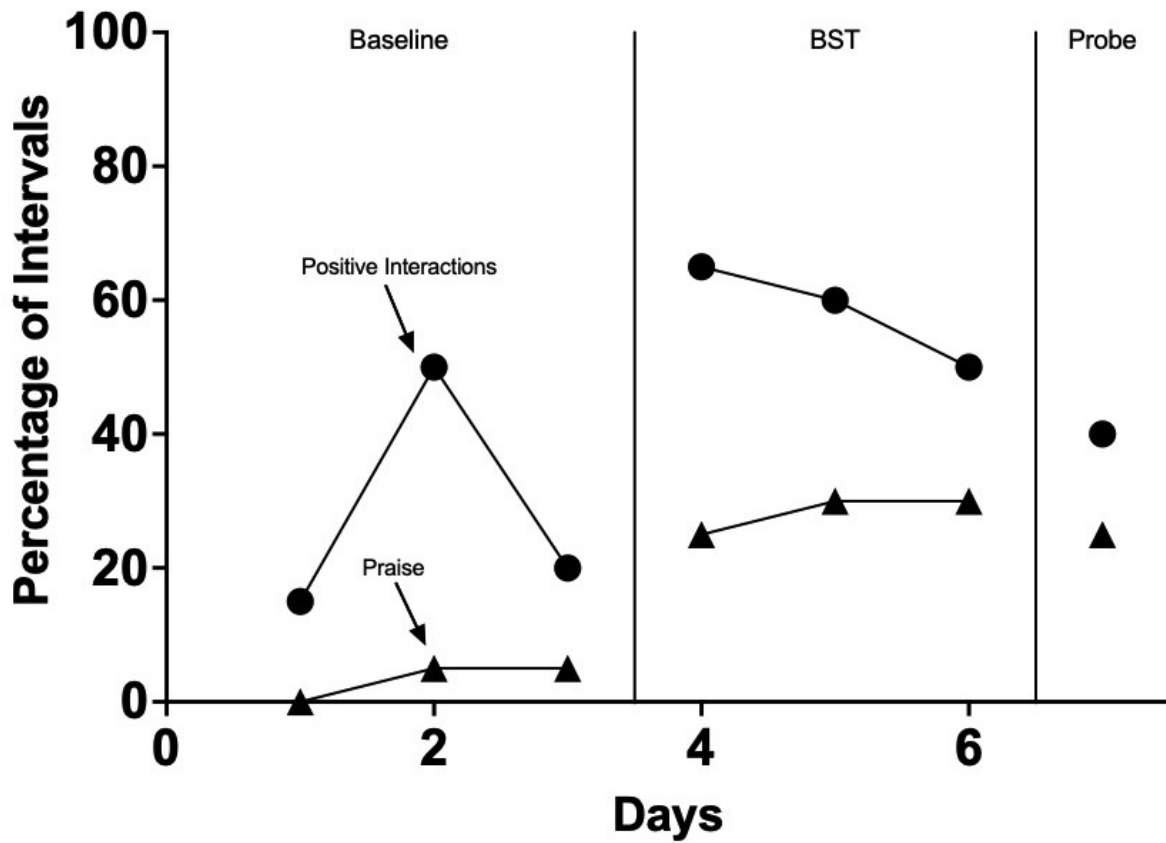


Figure 5. Participant 5's use of positive interactions and behavior-specific praise statements. Percentage of intervals is represented on the ordinate (y-axis) and days are represented on the abscissa (x-axis). Positive interactions are denoted with solid circles and behavior-specific praise is denoted by open triangles.

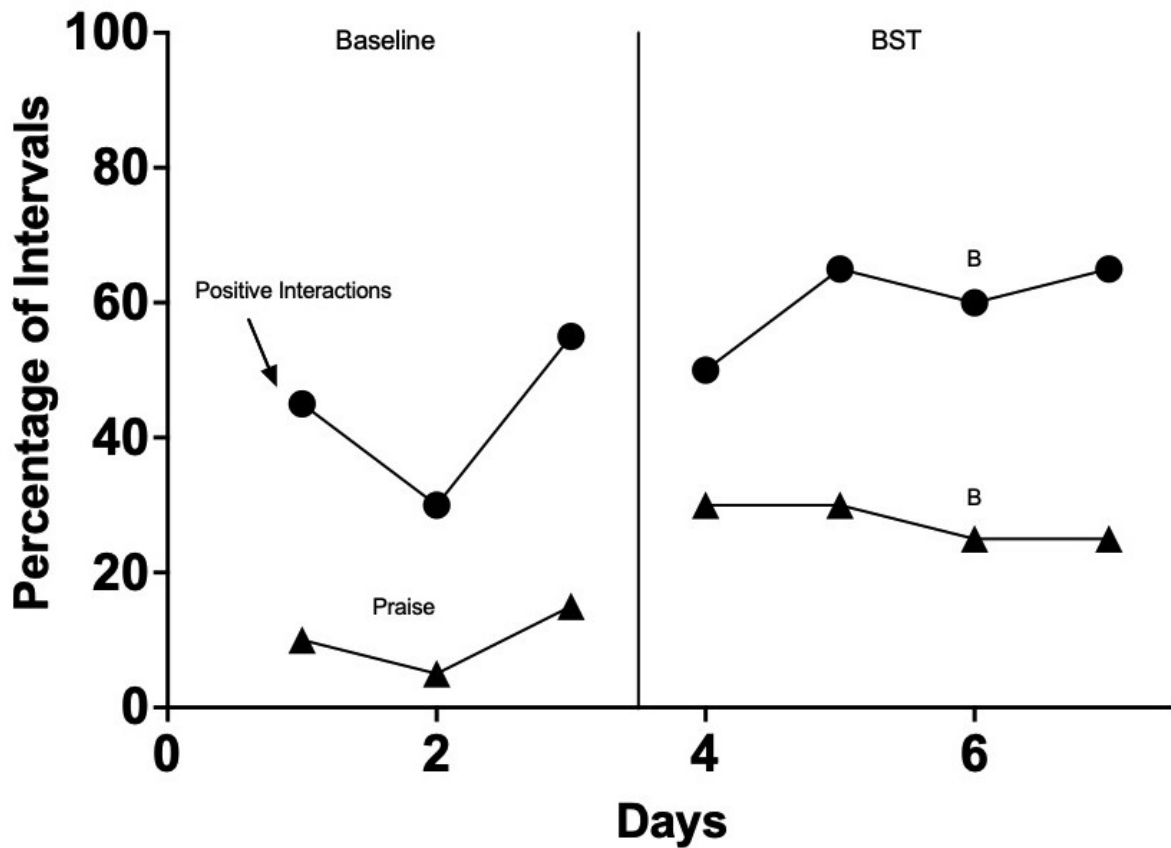


Figure 6. Participant 6's use of positive interactions and behavior-specific praise statements. Percentage of intervals is represented on the ordinate (y-axis) and days are represented on the abscissa (x-axis). Positive interactions are denoted with solid circles and behavior-specific praise is denoted by open triangles. Booster feedback sessions are denoted with "B".

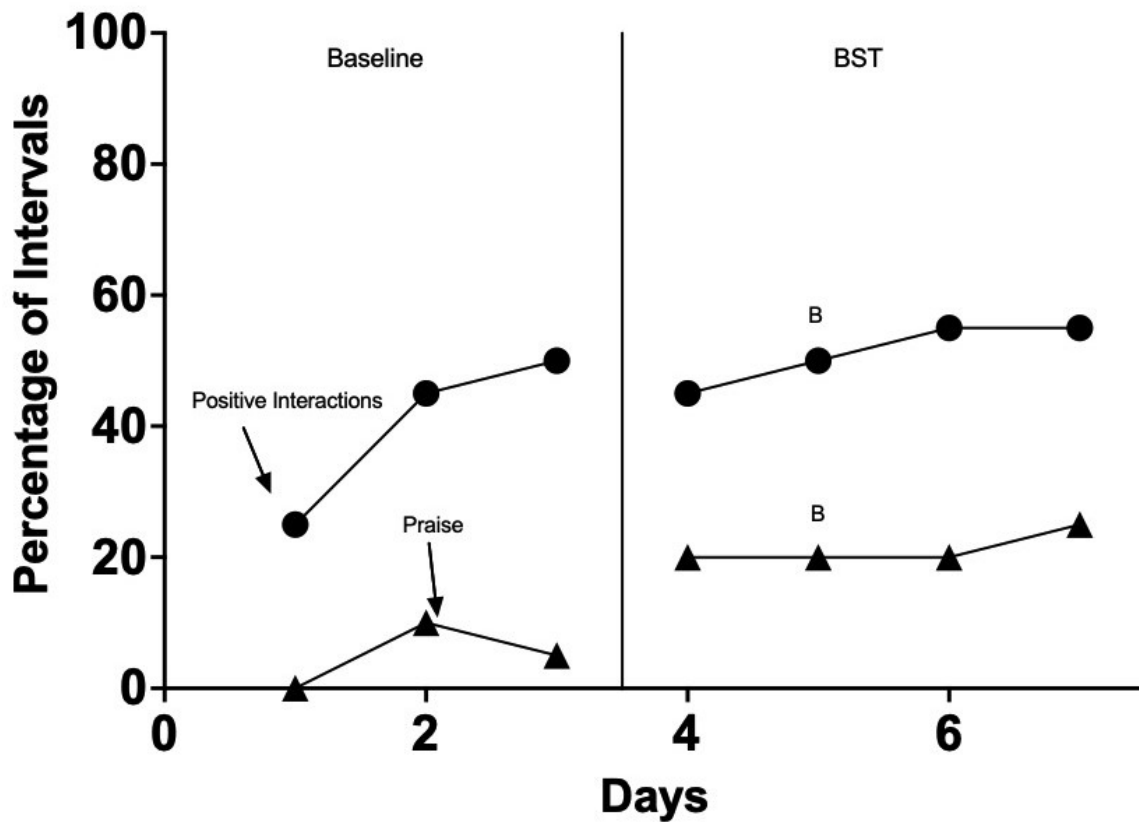


Figure 7. Participant 7's use of positive interactions and behavior-specific praise statements. Percentage of intervals is represented on the ordinate (y-axis) and days are represented on the abscissa (x-axis). Positive interactions are denoted with solid circles and behavior-specific praise is denoted by open triangles. Booster feedback sessions are denoted with "B".

**APPENDICES**

**Appendix A: IRB Approval Certificate**



IRB #: IRB-FY2021-436

Title: The Effects of Pyramidal Training and Behavioral Skills Training on Staff interactions with Students with Developmental Disabilities

Creation Date: 1-29-2021

End Date:

Status: Approved

Principal Investigator: Michael Clayton

Review Board: MSU

Sponsor:

**Study History**

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Submission Type	Initial	Review Type	Expedited	Decision	Approved
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## **Appendix B: BST Checklist, Stage 2**

### Stage 2: Train-the-trainer I

- Introduce behavior specific praise
- Provide rationale on why it is important to use positive interactions and behavior specific praise in the school setting
- Provide positive interaction operational definition
- Provide behavior specific praise definition
- Provide suggestions on how paraprofessionals can use positive interactions and behavior specific praise in during the school day
- Ask if there are any questions
- Discuss baseline performance with each paraprofessional
- Discuss criterion for mastery
- Model positive interaction
- Model behavior specific praise
- Observe paraprofessionals
- Deliver feedback
- Thank the Paraprofessionals for their time and participation

Note. The behavioral-skills checklist was provided to the lead teachers to use when they conducted stage 2 of the training. Lead teachers completed the training in the order provided on the checklist and checked the topics off as they went.

## **Appendix C: BST Checklist, Stage 3**

### Stage 3: Train the Trainer - Feedback

- Provide a positive statement about the observation
- Make specific suggestions as to how the paraprofessional could increase response rate
- Ask if they have any questions
- Thank that paraprofessional

Note. The behavioral-skills checklist was provided to the lead teachers to use when they conducted stage 3 of the training. Lead teachers completed the training in the order provided on the checklist and checked the topics off as they went.