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A Comparison of Feedback Procedures on Teachers' Use of Behavior Support Strategies and Children's Problem and Alternative Behaviors in Preschool Classrooms

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A Comparison of Feedback Procedures on Teachers' Use of Behavior Support
Strategies and Children's Problem and Alternative Behaviors in Preschool
Classrooms

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts
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Dedication

I dedicated this manuscript to my family and research participants.

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ABSTRACT

The purpose of this study was to compare the effects of two feedback procedures: written feedback and written feedback plus audio feedback on two teachers' use of behavior support strategies and two children's problem and alternative behaviors in two community preschool settings. A non-concurrent multiple-baseline design across teacher-child dyads with an A-B-C sequence was used to assess the effects of the feedback procedures on teacher and child target behaviors. A 10-second partial interval recording system was used to measure child target behaviors during 10-minute sessions and an event recording system to measure teacher use of strategies. The results indicated that the written feedback increased teachers' use of support strategies and reduced children's problem behaviors and increased alternative behaviors; however, the audio feedback with written feedback procedures further increased teachers' use of strategies resulting in further improvement in children's target behaviors. There was some evidence that teachers maintained their use of strategies without feedback procedures and generalized the use of strategies to non-targeted children.

Introduction

In early childhood settings, there has been an increase in the number of children with emotional and behavioral problems. Lavigne et al. (1996) investigated prevalence rates for children with problem behavior, between the ages of 2-5. The authors reported 16% of children had Oppositional Deviant Disorder. They also reported that nearly 21% of pre-school aged children were considered to have a diagnosable psychiatric disorder. One reason for attention to problem behaviors of young children is that in many cases the early childhood problems continue to hinder the children's development and social competence (Kaiser, 2007). Literature indicates that untreated early childhood problem behaviors are associated with substance use, unstable employment, and relationship difficulties during adulthoods (McMahon, Wells, & Kotler, 2006)

Although early intervention for children with behavioral challenges are imperative to prevent future problems, in general, the early childhood educators have limited formal training to work with children who need individualized support (Hemmeter, Fox, Jack, & Broyles, 2007). Preschool teachers report that they are not prepared to address problem behaviors in their classrooms (Fox, Little, & Glen, 2001). As a result of the increase in problem behaviors, children are removed from pre-school programs (Hemmeter et al., 2007).

The children who have persistent problem behavior that interferes with their development and school success require individualized behavior support. They could benefit from a behavior support plan based on functional behavioral assessment (Crone,

Hawken, & Bergstrom, 2007). A behavior support plan (BSP) is intended to provide the child with an appropriate behavior to engage in that serves the same function as the inappropriate behavior (Sanetti, Luiselli, & Handler, 2007). Also, the BSP includes strategies that manipulate antecedents responsible for problem behaviors to reduce the frequency of unwanted behaviors. The antecedent-based, preventative strategies are implemented to avoid problem behaviors, and a planned consequence is added to increase alternative behaviors while decreasing problem behavior (Blair, Bos, & Umbreit, 1999; Doggert, Edwards, Moore, Tingstrom, & Wilczynski, 2001). In designing and implementing the individualized BSP, it is essential for teachers to learn to identify the function of the problem behavior. Also, teachers need training in selecting appropriate preventative and response strategies and to implement the BSP correctly (Blair et al., 1999; Crone, Hawken, & Bergstrom, 2007; Schepis, Ownbey, Parsons, & Reid, 2000). However, trainings that consist of workshops have shown to be ineffective in bolstering treatment integrity (Kramer, Cook, Browning-Wright, Mayer, & Wallace, 2008; Malone, Straka, & Logan, 2000). The trainings with these formats do not provide opportunities for teachers to practice steps from the BSP and receive feedback on their performance.

Studies have shown performance feedback to be successful in training teachers in the process of implementing behavior support plans (Coddling, Livanis, Pace, & Vaca, 2008; DiGennard & Martens, 2007). Findings from studies suggest that performance feedback increases teacher skills, intervention implementation fidelity, and promotes early social competence and communication skills in children with problem behaviors (Coddling et al., 2008; Dignard & Martens, 2007; Goodman et al., 2008; Noell, Witt, Gilbertson, Rainer, & Freeland, 1997). Performance feedback can be delivered in

different ways. It can be delivered using verbal, written, or graphical method during an observation (Casey & McWilliam, 2008). Van Houten (1980) described essential elements that contribute to the effectiveness of feedback. Specific statements that inform the learner what behaviors are correct or incorrect led to a greater rate of acquisition than general descriptions of the behavior. The author stated that the immediacy and frequency of feedback and who provides the feedback also impacts the learner's performance. Although performance feedback has been investigated in the literature, more research is needed to examine the efficacy of feedback procedures on changing teacher behavior in preschool settings.

Targeted Teacher Skills and Measurement

Performance feedback has been used to increase various teacher instructional skills or decrease ineffective instructional behavior. For example, Rathel et al. (2008) and Reinke, Lewis-Palmer, and Merrell (2008) targeted specific teacher behaviors, such as the frequency of praise and reprimands as the primary dependent variables. Stormont et al. (2007) used feedback procedures to increase Head Start teachers' use of pre-correction and descriptive praise. Increasing teacher's use of incidental teaching and discrete trial training are other behaviors targeted for change (Casey & McWilliam, 2008). A naturalistic teaching strategy using incidental teaching has been found to be beneficial for children with developmental disabilities (Barton & Wolery, 2007; Daugherty, Grisham-Brown, & Hemmeter, 2001; Kaiser, Istrosky, & Alpert, 1993; Werts, & Holcombe, 1994). Incidental teaching has the potential to increase skills generalizing to other routines and ameliorates teacher and child interactions (Grisham-Brown, Pretti-Frontczak, Hemmeter,

& Ridgley, 2002). Casey and McWilliam (2008) used graphical feedback in an attempt to increase the frequency of incidental teaching among 21 lead and assistant teachers. Discrete trial training (DTT) is another teaching method that consists of the teachers delivering instructions followed by prompting and immediate delivery of reinforcers in a controlled setting. Downs, Downs, and Rau (2008) sought to increase DTT skills among pre-service teachers by delivering feedback at the end of the session. Feedback was delivered in the form of a treatment integrity checklist accompanied with praise and corrective statements. Scheeler and Lee (2002) also targeted DTT skills among pre-service teachers. Performance feedback was delivered immediately through a wireless audio device.

Also targeted for change was the percentage of treatment steps implemented correctly. Several authors measured the effects of performance feedback on teacher treatment fidelity through permanent products such as charts, completed assignments, and flashcards (Coddington et al., 2008; DiGennaro et al., 2007; Gilbertson et al., 2007; Mortenson & Witt, 1998; Noell et al., 1997; Noell et al., 2000). A limitation with obtaining the percentage of treatment steps implemented correctly is a lack of objective measurement of teacher implementation (Cooper, Heron, & Heward, 2008).

Other measurement methods have been used by researchers to evaluate the extent the intervention was implemented accurately. For instance, Jones, Wickstrom, and Friman (1997) used a direct observational method of partial interval recording to gather data on treatment integrity. With this recording method, observers noted the extent the teacher accurately implemented the treatment steps in the set interval. Reinke, Lewis-Palmer, and Merrell (2008) monitored treatment integrity through self-assessment. The

teacher gathered data on whether or not the treatment step was implemented. Self-monitoring was shown to facilitate teacher's awareness of their performance.

Methods of Feedback

Performance feedback can be delivered in a variety of forms. The methods of feedback that have mostly been investigated in the literature include graphical, written or email, verbal corrective statements, and audio coaching through a wireless device.

Graphical feedback. Graphical feedback has shown to be effective in changing teacher behavior (Casey & McWilliam, 2008; DiGennaro et al., 2007). With graphical feedback, teachers are given a visual representation of their behavior. The graph illustrates past behavior that will function as an antecedent for reinforcement for future behavior. Prior to implementing graphical feedback, teachers are informed of the target behaviors and given opportunities during training to practice. In the study by Casey and McWilliam (2008), the teachers were provided with a graph with the frequency of incidental teachings along with verbal feedback. During this feedback session, consultants provided praise and corrective feedback.

Noell et al. (1997) and Noell et al. (2000) provided teachers with graphical feedback that displayed student's performance and data representing teacher implementation. The visual representation of student performance has potential to reinforce teacher implementation of the BSP. Graphical feedback is provided in addition to praise and corrective statements. Researches informed the teacher steps implemented incorrectly or missed. DiGennaro et al. (2007) examined the effects of graphic feedback on teacher behavior. This study had different phases. Phase one had goal setting and student performance feedback. During this phase, teachers selected a goal for the student.

All the phases in this study administered graphical feedback, but displaying different behaviors. Phase one graphical feedback reflected student performance and phase two graphical feedback illustrated teacher performance.

Written feedback. DiGennaro et al. (2005) used a multiple baseline design across student-teacher dyads to assess the effects of written feedback on treatment integrity among elementary teachers. The written feedback informed the participants how accurately they implemented the interventions. However, the authors provided no information on the length or specific content of the written feedback. Jones, Wickstrom, and Friman (1997) targeted teacher's treatment integrity and student on-task behavior. The researchers used written feedback that contained information on the observation session. Specifically, the written feedback gave the percentage of time the student was on-task and the percentage of treatment integrity steps implemented correctly. Results showed a significant increase in treatment integrity, but student on task behavior had small increases. Low rates of student behavior could have been a result of a poorly designed BSP and not necessarily related to the teacher's implementation of the BSP.

Feedback via email. An effective tool for delivering feedback is through email. According to Barton and Wolery (2007), this method can potentially save time by minimizing the direct conversations between the consultant and consultee. Also, it is found to be an efficient tool for automatically keeping data for the consultant. Most importantly, feedback sent electronically is reported to increase communication between the consultant and consultee. It sets the occasion for the consultee to ask questions that otherwise he might not have the opportunity to ask because of factors in the work setting. Rathel (2008) delivered performance feedback through e-mails with monitoring graphs to

elementary teachers. The authors used line graphs to illustrate the rate the teacher provided praise.

Rathel, Drasgow, & Christle (2008) examined the effects of email feedback on teacher's use of positive verbal and non-verbal behaviors. In using email feedback, the researcher sent a graph illustrating a frequency count of positive verbal and non-verbal behaviors. Each e-mail sent had a greeting, praise, corrective feedback and an opportunity to ask questions. Researchers have used email to provide teachers with a variety of information about their performance. For example, in the study by Barton and Wolery (2007), the emails contained notes about the day's observations sessions. Specifically, the email stated the frequency of the teacher's use of expansions. There was an opportunity at the end of the email to ask a question to facilitate dialog between the consultant and teacher.

Hemmeter et al. (in press) delivered e-mail feedback to increase descriptive praise statement among four preschool teachers. The teacher participants typically received e-mail messages within 24 hours of the observation, containing performance feedback with a web link to a descriptive praise video exemplar. The e-mail included opening comment, supportive feedback, corrective feedback, planned actions, and closing comments. The teachers were directed to view a specific video clip of teachers using descriptive praise statements.

Verbal corrective feedback. In some of the studies, the researchers delivered verbal corrective feedback during the intervention session or provided feedback immediately following the session (Downs et al., 2008; Gilbertson, Witt, Laflour, Singletary, & VanDerHeyden, 2007). Mortenson and Witt (1998) provided praise to

elementary teachers for correct implementation of the behavior support plan. As well as corrective statement for treatment steps reported inaccurately. An opportunity to ask and answer questions regarding the behavior support plan was given during the meeting.

Audio coaching through wireless devices. Immediate and corrective feedback can be delivered through a wireless device such as an FM radio. Audio coaching allows for the researcher to conduct in situ assessments with minimum interruptions in the natural environment (Scheeler & Lee, 2002). Delivering feedback with this type of technology facilitates transfer of stimulus control to the participants at a faster rate as oppose to having the researcher in the room delivering feedback in person (Oliver, 2008). Another advantage to this covert method is the participants will not practice incorrect responses. Since immediate corrective feedback will inform the participant of an error. When the error occurs the participant will immediately correct their behavior due to the feedback sent through the audio device (Goodman et al., 2008).

Oliver (2008) audio coaching was implemented to target parent's delivery of prompts and praise to their child. In the training phase, the parent wore a wireless radio device while the researcher gave instructions to the parent to complete everyday activities. The purpose of this phase was for the participants to become acclimated to wearing the device and following directions without being able to communicate to the researcher. The participants were children with autism and their parents. The coach instructed the parent with the type of prompt to deliver and to praise the child for task completion. Corrective feedback was also delivered at this time. Together the parent and researcher identified problematic daily routines in the home. These included, bath time,

getting dressed, and brushing teeth. A task analysis was conducted to define the child's target behavior necessary to complete the task.

Another study (Scheeler & Lee, 2002) evaluated the effects of feedback delivered via a wireless device. The researchers sought to target the teacher's delivery of three term contingency trials completed. Training consisted of role playing and modeling the behaviors involved in the delivery of this type of teaching strategy. Prior to receiving feedback on the use of the three-term contingency, feedback was given to the participants on a novel teaching task. During the intervention sessions, feedback was provided in short corrective statement within 1 to 3 seconds of the target behavior. Goodman and his colleagues (2008) also used a wireless device to provide feedback to change the same teacher behavior. Although the researches referred to this behavior as a learned unit, trainings were similar to the above studies, in that, the participants wore the wireless device during unrelated activities from the intervention session and received feedback. Unlike Scheeler and Lee (2002), in this study the researcher and participants met briefly after the intervention session to review the lesson. This provided the participants with opportunities to ask questions and receive clarity on target behaviors.

Timing and Frequency of Feedback

Timing of feedback. The rate of acquisition is affected by the timing of feedback. Feedback immediately following the target behavior results in a higher rate of acquisition than feedback that is delayed (Van Houten, 1980). Given that, delayed feedback will not be delivered contingent upon the target behavior and unwittingly an incorrect response can be reinforced (Scheeler, Ruhl, & McAfee, 2004). Delayed feedback was given following the sessions, prior to the sessions, or a few days after the sessions. The method

for delivering feedback varied across the studies, but the content was similar, in that, corrective statements were provided and praise was given for correct responses (Downs et al., 2008; Mortenson & Witt, 1998; Reinke et al., 2008;). In one study (Barton & Wolery, 2007). Feedback delivered via e-mail was sent within 4 hours following the observation session. Although the time the teacher read the email ranged from the evening or the next day.

The content of feedback was similar for studies that used delayed feedback. The researcher provided corrective statements and praise for correct responding

Frequency. Another element that affects the rate of acquisition is the frequency of feedback. In general, feedback provided often results in a high rate of teacher acquisition of instructional skills (Van Houten, 1980). Across the studies the frequency of feedback varied. In Gilbertson et al. (2007) the frequency and amount of feedback given by researchers was 4-5 days a week for 5- 6 weeks. A similar frequency of feedback was used in Goodman et al. (2008) where feedback was given 3-5 days per week. In some studies, the frequency of feedback was provided once a week or daily. For the studies with daily feedback, the frequency usually corresponds with how many interventions sessions were implemented (Casey & McWilliam, 2008; Goodman et al., 2008; Mortenson & Witt, 1998).

Effectiveness of Performance Feedback

Performance feedback resulted in behavior changes for teachers and students (Gilbertson et al., 2007; Mortenson & Witt, 1998; Reinke et al., 2008). Clearly, performance feedback was shown to consistently change behavior more than phases with no feedback. The teacher performance feedback implemented in several studies

(Goodman et al., 2008; Noell et al., 1997; Reinke et al., 2008) demonstrated that the improved teacher skills led to increases in children's academic skills and decreases in the frequency of disruptive behaviors of children's problem behaviors. Downs and his colleagues (2008) reported instructors' use of discrete trial skills increased as well as the percentage of student correct responses. This indicates when teacher's behavior improves this can facilitate improved student behavior.

Another study (Noell et al., 1997) that evaluated performance feedback to increase student and teacher behavior resulted in increases in academic performance of two of three students. Studies indicate that high treatment integrity will not necessarily result in high changes in student behavior (Jones, Wickstrom, & Friman, 1997; DiGennaro et al., 2007). Mixed results were exhibited in Noell et al. (2000). Four of the five teachers' behavior improved above baseline. Additionally three of the five students had increased their percentage of correct responses. Therefore, researchers suggest that other variables besides teacher training should be examined in order to increase student behavior (Noell et al., 1997). Not all studies that implement performance feedback target both student and teacher behaviors. Casey and McWilliam (2008) measured the effects of graphic feedback on teacher's use of incidental teaching. Data indicated teachers increased their use of incidental teaching. The outcomes of the intervention are unknown in regards to student behavior.

Generalization and Maintenance

For performance feedback to be considered effective, behavioral skills must maintain across time, tasks, and settings (Stokes & Baer, 1977). Immediate feedback was given in Oliver (2008) to increase effective prompting and praise among parents. The

generalization phase targeted routines that were not trained with the audio coaching and no feedback was provided in this phase. Generalization phase was assessed for 7 sessions each 10 days apart. All the participants had stable changes in their target behavior during the generalization phase.

Response induction was evaluated in Barton and Wolery (2007). The researchers measured the generalization effects of feedback through email to determine whether the feedback procedure would increase behaviors other than the dependent variables. Results indicated that the intervention did not increase untrained teacher behaviors. When determining the target behaviors to be trained, it is suggested that researchers assess how similar the response forms are from the trained skill to the untrained skill (Ingvarsson & Hanley, 2006). To ensure response induction, researchers should use caution when selecting target behaviors. This is possible by training behaviors that closely resemble the untrained skill. In response to this challenge, one factor that can impede this process is the topography of the desired behavior (Dennis & Harris, 1998)

Social Validity

To assess the extent to which the change agents find the intervention acceptable and practical, studies used a rating scale (DiGennaro et al., 2007; Rathel et al., 2009; Scheeler & Lee, 2002). Feedback that was delivered through graphs, email, or audio headset was rated of high importance and effective by the participants in the studies. For example, Scheeler and Lee (2002) assessed social validity with a questionnaire. The participants were asked two questions; was receiving immediate feedback helpful and was the audio headset a distraction? Results indicated that all three participants rated immediate feedback helpful and the audio headset was not a distraction. However, except

a few studies described above, most of the studies did not examine social validity. This is a limitation of the current literature. When social validity is assessed researchers receive feedback on their intervention which helps guide future practices.

As discussed above, the method to delivering effective feedback can vary from graphs through a wireless device. However, very few studies compared different methods of performance feedback. Several researchers used written feedback in combination with graphs (DiGennaro, Martens, & McIntyre, 2005) or verbal feedback with modeling and rehearsal (Moore et al., 2001). Currently, it is not clear whether a particular feedback method is more effective than other methods or teacher support procedures in improving teacher skills or performance.

To date, most of the studies on teacher performance feedback have been conducted in elementary school settings. Information about the effectiveness of the performance feedback in early childhood settings is limited (Casey & William, 2008). Considering the lack of training in the early childhood settings and the different classroom ecology from that of elementary school classrooms, research is needed to evaluate the effects of performance feedback in this particular setting. Furthermore, efficient and practical methods to deliver immediate feedback need to be explored in future studies as well. In addition, there is a need for studies that determine whether teacher support through performance feedback is acceptable or socially valid in early childhood settings.

Of particular concern with implementing intervention in the natural classroom setting is the ability of classroom teachers to generalize the intervention procedures or implementation skills to routines or activities that were not targeted for training or to non-targeted children (Hundert, 2007). It is expected that changes in child behavior would be

observed during non-targeted routines if teachers could successfully generalize procedures or their skills to those non-trained situations (Peck, Killen, & Baumgart, 1989).

Therefore, the purpose of this study was to compare the effects of two feedback procedures: written feedback and audio plus written feedback on teachers' use of behavior support strategies and children's problem behaviors during classroom routines in two community early childhood programs. This study attempted to address the following questions: a) will the written feedback increase teachers' use of behavior support strategies; b) will the additional audio feedback paired with the written feedback further increase the teachers' use of target strategies; c) will teachers generalize the strategies to non-targeted children; and d) will the feedback intervention result in changes in children's problem behavior and alternative behavior?

Method

Participants

The participants were two preschool aged children each served in two separate communities early childhood programs. Carl and Danielle were both 4 yrs old at the time of this study. Carl and Danielle were identified as low-income receiving public assistance for receiving services at the programs. Both children were referred to us by the program directors due to their difficulties in adjusting to their classrooms.

Carl was African American and the oldest child of four children. He was reported to be typically developing. He was able to follow simple teacher directions and the sequence of classroom routines. However, he was often noncompliant ignoring teacher requests, engaged in aggression, and had difficulty engaging in activities. Danielle was Hispanic and an only child. Danielle received 1.5 to 2 hours of speech therapy per week due to her language delay. She had difficulty using verbal language to communicate. Her primary language was Spanish having parents with limited English proficiency. It was reported that she was scored as performing 1.5 SD below the mean on the total language score of the Preschool Language Scale-Fourth Edition (PLS-4; Zimmerman, Steiner, & Pond, 2002) when she was accepted to her current Head Start program. She also engaged in aggression, non-compliance, and off-task behaviors. She could perform simple routine requests and respond to the teacher with one or two words when requested to do so. From the direct and indirect assessment information Carl's problem behavior appeared to be

maintained by gaining teacher attention and items or activities and Diane's problem behavior appeared to be maintained by gaining teacher attention.

This study also included the children's two classroom teachers. Wendy, age 24 was Danielle's teacher and had five years experience as a pre-school teacher. Ms. Sara, age 23 served Carl's classroom and had two years experience as a pre-school teacher. Teachers had no prior experience in receiving training on routine-based behavior support for children with challenging behavior. They had earned a childhood development associate certificate and a high school diploma. Participation in this study was voluntary and teachers expressed an interest in receiving training and implementing routine-based behavior support. Participants were recruited from two community early childhood programs where the program administrators indicated a willingness to participate in the study.

Setting

This study took place in 2 classrooms in separate early childhood programs located in a large urban city. Both classrooms were divided into different activity centers such as block, housekeeping, manipulative, art, book, and sand table. Ms. Wendy's classroom had 20 children. She was employed by Head Start. The classroom had a full time assistant teacher. The assistant teacher was always present during the observation sessions and she was active with the target child. Baseline and intervention sessions were conducted during the transition from center time to lunch. This routine lasted approximately 10 minutes. Ms. Wendy often resulted to sternly giving instructions to gain compliance over the class and verbally reprimanding the students to get them to participate in the routine. The children were expected to clean up toys in their center area,

wait in line at the sink, and wash their hands, and sit at the table to wait for the next instruction.

Ms. Sara was employed by a full-day child care center. Her classroom served 20 children, but the number of children in this classroom fluctuated depending on the availability of a teacher assistant. When the teacher assistant was absent, she had 10 children. Ms. Sara usually did not have a teacher assistant in her classroom. On the days when the teacher assistant was in the classroom, the assistant had little involvement with the target child. Baseline and intervention sessions were conducted during center time. Center time lasted approximately 40 minutes. The teacher's instruction style consisted of sternly stating instructions, "play with your toy", verbal reprimands, and time-outs. Children were expected to play appropriately with toys, share, take-turns with toys, and wait their turn without the teacher's assistance.

Materials

The Creating Teaching Tools for Young Children with Challenging Behavior (TTYC; Vaughn, Lentini, Fox, & Blair, 2009) was used to train teachers and help them develop and implement behavior support plans for participating children. The TTYC was designed to help teachers create behavior support plans for children with challenging behavior. The tool kit contains information to assist teachers in identifying the function of behaviors, creating preventative and response strategies for challenging behavior and information on teaching replacement behaviors for inappropriate behavior. Teaching Tools provides pre-constructed routine-based strategies originally housed on a CD that includes materials (e.g., tips, forms, guides, visuals) to be used as integrated parts of the behavior support plan. The Tools helps teachers select an array of strategies from 12

routines and activities based on simple routine based observations and monitor child progress over time using the simple observation tool.

Behavioral Measures

This study measured teachers' strategy use and child problem and alternative behaviors. For dyad 1 (Ms. Wendy and Danielle), teacher strategies included using transition cues, teaching self-management skills, and providing verbal praise and reinforcement in the form of a sticker for task completion. Definitions of the strategies are presented in Table 1. Child problem behavior included aggression in the form of taking toys from peers, pushing, hitting, and yelling. Off-task behavior was defined as playing with toys and wandering around the classroom. Non-compliance behavior was defined as not following a teacher direction within 5 seconds. Teacher direction such as, "clean-up", "pick up toys", "go to the sink" were likely antecedents for non-compliance. Alternative behaviors included engagement in the routine and following directions. Engagement in the routine was defined as picking up toys by using one or two hands to pick up an item and place it in its designated area with a 3 second delay between each item, waiting in line in front of the sink with hands to her side, washing hands (getting soap, rubbing hands, and drying hands), and sitting at the table with hands to her side. Following directions was defined as child responds to teacher's request within 5 seconds.

For dyad 2 (Ms. Sara and Carl), teacher strategies included the use of safety signals, positive reinforcement, redirection to alternative behaviors or activities, choices, and positive words. Definitions of the strategies are presented in Table 1. Child problem behaviors included aggression in the form of hitting, kicking, yelling, and throwing objects and off-task. Off-task behavior was defined as wandering around the classroom

or outside of designated center area. Non-compliant behavior was defined as not following a teacher direction within 5 seconds. Examples of directions given included “come here” or “don’t throw”. Alternative behaviors included engagement in routine, sharing, making choices, and following directions. Engagement in routine was defined as staying inside designated center area and playing with toys or peers. Sharing was defined as giving a child or teacher an item spontaneously or when being prompted. Making choices were defined as choosing a center activity from a choice board and go to the center chosen. Following directions was defined as student responds to teacher’s request within 5 seconds.

Table 1
Operational definitions of target strategies

Target Strategies	Operational Definitions of Target Strategies
<u>Dyad 1</u>	
Transition cue	Teacher gives a cue that it is time to start cleaning (i.e., ring bell, turn light on-off, use a visual cue)
Teaching self management skills	Teacher states the clean-up goals at the beginning, middle, and end of the routine
Verbal praise	Providing positive statements that acknowledge the appropriate behavior or completing each transition task
Tangible Reinforcement	Teacher gives a sticker to the child contingent on completing transition tasks
<u>Dyad 2</u>	
Setting timer	Reminding child that when the timer goes off, then it will be his turn to pick a new center activity
Choices with pictures	Providing choices between toys and center activities using pictures at the beginning of center time and when the child is ready to move to a different center
Redirection	Verbally prompting the child to use an alternative behavior when the child ignores teacher directions and immediately delivering positive reinforcement for complying with the direction or demonstrating alternative behavior

Positive words	Telling the child what to do instead of what not to do when reminding classroom expectations
Reinforcement	Providing positive statements that acknowledge the alternative or appropriate behavior and providing attention in the form of playing with the child

Data Collection and Interobserver Agreement

A 10-second partial interval recording system was used during 10 minute sessions for child behaviors measured. The total number of intervals with problem behaviors were divided by the total number of interval (e.g., 60) and then multiplied by 100 to calculate the percentage of intervals for each target behavior.

An event recording method was used for teacher's use of strategies during the 10 minute sessions. The percentage of correct use of strategies was measured by dividing the number of correct use of strategies by the total number of opportunities and multiplying by 100. Observers recorded the behaviors using a paper and pencil and a timer.

Videotaping and subsequent coding occurred 100% of the sessions. Two independent observers simultaneously viewed the videotaped sessions and independently recorded the behavioral measures. Both observers were master's students in the Applied Behavior Analysis program at the University of South Florida. The observers practiced observations using videotaped segments of center and transition times until they reached at least 95% agreement on at least two consecutive sessions.

Inter observer agreement (IOA) was calculated by using an exact count-per-interval IOA ($\text{number of intervals of 100\% IOA} / \text{number of intervals} \times 100$) for child behavior. A point-by-point IOA ($\text{number of correct-incorrect agreement} / \text{total number of opportunities} \times 100$) was used for teacher behavior. Mean interobserver agreements for

child and teacher target behaviors were obtained across the experimental conditions. In Table 2, the mean and the range of percent IOAs are presented for each dependent variable by participant and phase.

Table 2
Mean percent of interobserver agreement

Phases	Ms. Wendy	Ms. Sara	Danielle		Carl	
			PB	AB	PB	AB
Baseline	100	100	87 (85-90)	90 (85-95)	85 (71-91)	94 (91-98)
Written feedback	96 (89-100)	89 (87-92)	95.8 (95-96)	86 (83-96)	87 (81-93)	81 (76-86)
Written feedback with audio feedback	96.6 (93-100)	94.5 (93-96)	89 (88-90)	89.5 (87-92)	96.5 (95-98)	90.5 (90-91)
Generalization	92 (86-100)	93.75 (87-100)	N/A	N/A	N/A	N/A
Follow-up	100	87.5 (86-89)	91%	88%	89.5 (88-91)	88 (86-90)

Procedural Integrity

The researchers used an audio recorder to assess procedural integrity. The audio-taped sessions were transcribed and analyzed by two observers. The observers recorded the number of steps addressed during each written feedback and audio feedback sessions by analyzing the transcripts. For the written feedback session, the implementation of the following 5 steps were measured: (1) presented Ms. Wendy with the written feedback report, one hour after the session, on her strategy usage and the occurrence of the target child's behavior in the previous session (Ms. Sara received her written feedback report on the strategy usage and the child behavior immediately prior to the session), (2) reviewed

with the teacher percentages of strategies correctly used by the teacher, (3) reviewed the percentage of child's target behaviors, (4) provided positive feedback for the strategies used correctly, and (5) provided corrective feedback by reviewing the summary of observations regarding each strategy missed or used incorrectly.

For the written feedback with audio feedback sessions, the implementation of the following 7 steps were measured: (1) prior to the session the researcher reviewed the list of the strategies to be used during target routine routines, (2) reviewed the written feedback report and summary of examples, (3) had the teacher wear a headset, (4) delivered feedback statement when applicable, (5) gave a short statement reminding the teacher she missed an opportunity when the teacher missed an opportunity to use a target strategy, (6) provided a short praise statement when the teacher correctly implemented a strategy, and (7) gave a short corrective statement on the correct use of strategy when the teacher incorrectly implemented a strategy.

Average procedural fidelity to each phase of feedback procedures was 100% across both teachers indicating that all feedback steps were correctly delivered in each session. IOA for procedural fidelity, assessed by using a point-by-point method (item by item), was 100% for both teachers across phases. IOA was assessed for 100% of the sessions for dyad 1 and 70% of the sessions for dyad 2.

Social Validity

Social validity was measured by using an adapted Behavior Intervention Rating Scale (BIRS; Von Brock & Elliott, 1987) to assess the degree to which teachers found the feedback procedures acceptable, satisfactory, and effective. The adapted BIRS consisted of 24 items rated on a 6-point Likert-type scale (see Appendix). Each teacher completed

the survey questionnaire during follow-up. They were asked to return it via U.S. mail to the research staff.

Experimental Design

A multiple-baseline design across teacher-child dyads with an A-B-C sequence was used to assess the effects of the feedback procedures on child and teacher target behaviors. The experimental conditions consisted of (a) baseline, (b) written feedback, (c) written feedback plus audio feedback, and follow-up.

Procedures

Prebaseline. Prebaseline phase involved identifying target routines, target child behaviors, and functions of problem behavior. Teachers and the researcher identified problematic routines or activities that were most likely to be successful for intervention. Ms. Sara reported that Carl displayed problem behavior in the morning during the center time activities. He would yell, hit peers, run around the classroom, and not follow such directions as “stop running”, “don’t hit”, or “share your toys”. Ms. Sara identified children taking Carl’s toys and telling him, “No” as antecedents for his problem behavior. The teacher reported that she responded to Carl’s problem behavior by putting him on time-outs and reprimanding him, saying “why are you hitting?”

The researcher conducted one day, 2-hr observations to gather further information on Carl’s behavior, using a checklist, *Events and Functions Associated with Problem Behavior* provided in the TTYC manual (Vaughn et al., 2009) and an A-B-C observation form (Bijou, Peterson, & Ault, 1968). The results of the observations indicated that the functions of Carl’s problem behavior were gaining access to toys and teacher attention. His problem behavior occurred during situations when peers took or touched his toys and

when the teacher was not available or the teacher interacted with other children. His problem behavior resulted in obtaining toys or teacher attention in the forms of being reprimanded or being placed in time-out. When he ran around the classroom and threw toys at peers or in the air, his teacher responded with verbal reprimands and time-outs.

Ms. Wendy reported that Danielle had the most problem behavior in the morning transition time. She said her problem behavior was not listening to teacher directions, hitting, and yelling at peers. She identified peers in close proximity and teacher directions as antecedents for problem behavior. She reported that she responded to her problem behavior by removing her from her peers or making her complete the tasks. Observations using the same checklist and A-B-C form as used with Carl indicated that the perceived function of Danielle's problem behavior was gaining access to teacher attention. Danielle's noncompliance occurred during situations when told, "Clean up", "No", "Don't", "Stop" and when teacher helped another child. Danielle was immediately reprimanded when engaged in problem behavior. It was observed that Ms. Wendy stood 20 feet away from or sat in a chair and gave the direction quietly, "It's time to clean up". During this time, Danielle responded to teacher directions by playing, walking around the classroom, and told her peers to clean up. Occasionally, she grabbed toys from other children to put away without asking, and pushed her peers waiting in line in front of sink to wash her hands. Her teacher responded by verbally reprimanding and monitoring Danielle's cleaning up, getting within 5 feet. Danielle would start to pick up toys when being monitored by the teacher. The function appeared to be teacher attention.

Following the assessment of each child's behavior, the teacher and the researcher jointly selected behavior support strategies from *Routine Based Guide* included in the

TTYC, designed to address the functions of the target child's problem behavior within the context of classroom routines. Strategies for dyad 1 (Ms. Wendy and Danielle) included providing transitional cues (i.e., ring bell, turn light on-off, a visual picture) at the start of the transition to let Danielle know that it was time to start cleaning. Teaching Danielle self-management skills was emphasized to help her comply with teacher directions and transition tasks. A self-recording form listed Danielle's four transition tasks (i.e. pick up toys, line up at the sink, wash hands, and sit at the table) was created to teach her to self-monitor her task performance. The form included pictures of tasks, written short sentences, and check off boxes. The teacher was asked to review the self-recording form with Danielle at the beginning and end of the session. Strategies also included providing verbal praise contingent on the alternative behaviors to address problem behaviors maintained by teacher attention. It was planned that Danielle would receive reinforcement in the form of a sticker for task completion at the end of the transition routine.

For dyad 2, to address problem behavior maintained by access to tangible items, the strategies first focused on providing choices of centers or toys which would help prevent his problem behavior. It was planned that the teacher present choice boards at the beginning and middle of center activities, set a timer for 5 minutes, and remind Carl that when the timer goes off, then it will be his turn to pick a new center activity. Teaching him alternative skills focused on helping him make choices on the choice boards through verbal prompts and teaching him play skills through modeling to increase his engagement in activities. To address Carl's problem behavior maintained by access to teacher attention, strategies included delivering reinforcement contingent on his alternative

behavior in the forms of teacher positive statements that acknowledge his appropriate behavior and play time with teacher.

The strategies for each child were outlined in a simple behavior support plan that modeled after the form titled, *Teacher's Support Planning Sheet* included in the TTYC manual (Vaughn et al., 2010). The strategies were categorized into three components: prevention, teaching, and reinforcement.

Baseline. Data on teacher and child target behaviors were collected 1-2 times per week during the targeted routine or activity. Teachers were asked to provide activities or tasks and interact with the target child as the way they normally do. This phase was conducted with each teacher-child dyad until a stable level of data was achieved across teacher and child target behaviors. Observation sessions were 5-15 minutes depending on the target routine. Specifically, transition time depended on how quickly the children cleaned.

Intervention. The intervention consisted of two phases: one phase with written feedback procedure alone and one phase with the combined written feedback and audio feedback procedures.

Phase 1: written feedback. The first phase of intervention involved providing written feedback on teachers displaying the use of target behavior support strategies. Before each observation session of the target routine the researcher provided the teacher with a checklist of target skills displayed correctly, incorrectly, or missed from the previous observation session. Upon teacher's request for dyad1, written feedback on the previous session was given one hour after the observation session. Praise was given for target behaviors displayed correctly. Corrective statements were given for target skills

displayed inaccurately. In addition to the checklist, a short succinct summary of the last observation session was given to each teacher. The summary had 3-5 examples of target strategies used correctly and inaccurately from the observation session (Barton & Wolery, 2008; Downs, Downs, & Rau, 2008). Throughout the meeting the teacher was given opportunities to ask questions. The feedback meeting was approximately 10 minutes. The criteria for terminating the phase were when data showed a stable trend, level, and low variability.

Phase 2: Written feedback plus audio feedback. The second phase of intervention involved providing both written feedback and audio feedback during observations of teacher use of behavior support strategies and target skills. The written feedback was delivered the same as in the written feedback phase. Before each observation session of the problematic routines the researcher provided the teacher with a checklist of target skills displayed correctly, incorrectly, or missed from the previous observation session along with a short succinct summary.

Before the implementation of the audio feedback, the researcher provided 30-minute training on the use of the audio head-set. The researcher gave the teacher novel directions in order for the teacher to acclimate to wearing the audio headset. For example, “Turn of the lights” or “Push the chair in.” A list of possible corrective feedback words along with definitions and examples were provided to the teachers to allow them to become familiar with the feedback statement prior to the audio feedback phase. The researcher practiced saying the corrective feedback statements through the audio headset and the teacher practiced the use of target behavior support strategies. At this time the

researcher adjusted to the appropriate volume level and found an unobtrusive location in the classroom to stand for the audio feedback phase (Oliver, 2008).

The researcher provided an average of 3-5 feedback statements during the 5-15 minute implementation of the audio feedback procedure. Examples of corrective or prompting feedback statements delivered through the audio headset were “provide choices”, “remember to set the timer”, “provide the choice board”, or “remember to state transition expectations”. Examples of praise included, “Nice job using the choice board”, “Nice work giving praise”. The criteria for terminating the second phase of feedback intervention were when data showed a stable trend, level, and low variability.

Generalization Probes. Generalization probe data were collected throughout the experimental phases to investigate teachers’ use of the strategies with non-targeted children. No feedback was provided to the teacher using the strategies for the non-targeted children. Observation procedures were identical to baseline. Generalization data were collected in each classroom one to two times during baseline and two to three times during intervention. Each child in the class was eligible to be considered a non-targeted child for generalization probes.

For Ms. Wendy generalization probe data were collected on the following three target strategies; transition cue, verbal praise, and reinforcement with sticker for task completion. The transition cue was scored as a missed opportunity if the teacher failed to give an obvious cue that it was time to start cleaning (e.g., ring bell, turn light on-off, use a visual cue). An occurrence was scored as correct if she did provide the cue. Verbal praise was scored as a missed opportunity if the teacher did not make comments to any non-targeted child who was within 5 -7 feet for cleaning, washing their hands, and sitting

at the table. It was scored as an occurrence if comments were made when the non-targeted child cleaned, washed their hands, and sat at the table. Tangible reinforcement was scored as an occurrence if the teacher gave a sticker to any non-target child for completing all the tasks (cleaning up toys, washing their hands, and sitting at the table). Reinforcement was scored as a missed opportunity if Ms. Wendy failed to give the sticker to any non-targeted child for task completion.

For Ms. Sara data were collected on two target behaviors; verbal praise and setting the timer. For verbal praise to be scored as an occurrence, the teacher needed to make a comment to any non-targeted children for staying in their assigned area, (“Thank-you Billy for playing in your center”), playing appropriately with toys, and sharing. For verbal praise to be scored as a missed opportunity the children needed to be between 5 and 7 feet from the teacher and she makes no comments to the children that are staying in their assigned area, playing appropriately, and sharing. (e.g., the teacher walks by two children building bridges together with blocks and fails to make a praise statement for sharing and playing appropriately). Setting the timer was scored as an occurrence if the timer went off and the teacher had any non-targeted child switch center areas. A missed opportunity was scored if the timer went off and the teacher did not have any non-targeted child change centers.

Follow-up. Follow-up data were collected two weeks later following the termination of the feedback procedures. Weekly probe data were collected for a period of 3 weeks for dyad 2 and 1 week for dyad 1. Only one weekly probe data was collected for dyad 1 due to the child’s move to a new program

Results

Figure 1 shows the percentages of teacher correct use of strategies and the percentage of intervals in which each child's target behaviors occurred across baseline, intervention, and follow-up phases. Teachers' generalization of their use of intervention strategies are also shown in Figure 1.

Teachers' Use of Strategies

As shown in Figure 1, the use of intervention strategies across teachers was 0% during baseline. Once the written feedback phase began, Ms. Wendy's use of the strategies immediately increased, ranging from 25% to 87% with a mean of 61% (see the top panel). Ms. Sara's levels of strategy use also increased above baseline levels with scores ranging from 5% to 90% ($M = 55.6\%$). However, her levels of strategy use did not remain stable and showed a downward trend during the written feedback phase.

When the combined audio and written feedback was implemented, Ms. Wendy's use of the strategies further increased to 100% throughout the sessions. Ms. Sara's use of strategies ranged from 80% to 100% ($M = 94\%$) and remained stable as the second feedback procedures continued. Follow up data showed that Ms. Wendy's use of strategies decreased in the level with 33% two weeks after feedback was faded. However, the levels of her strategy use remained above baseline levels. Ms. Sara's use of strategies remained high in the level with a range of 79%-91% ($M = 85$) during follow-up.

Generalization

Generalization probe data were collected on the teachers' use of the intervention strategies with non-targeted children. The data showed that the teachers generalized their use of strategies to not-targeted children. During baseline, both Ms. Wendy's and Ms. Sara's use of strategies with non-target children were 0%. In written feedback phase, their use of the strategies increased to 37% to 78% (M = 60%) and to 0%-73% (M = 31%), respectively. In the audio plus written feedback phase, the levels of strategy use was 58% for Ms. Wendy and 25%-50% (M = 37.5 %) for Ms. Sara. During follow-up, their use of strategies with non-targeted children was 45% and 0%-20% (M = 10%), respectively.

Children's Problem and Alternative Behaviors

When the teachers began implementing the behavior intervention strategies in support of research staff through written feedback, both Danielle's and Carl's problem behavior immediately decreased while their alternative behaviors dramatically increased. As shown in Figure 1, they demonstrated further improvement (Danielle) or stable (Carl) in the levels of their target behaviors when the combined audio and written feedback was provided to the teachers.

In baseline, Danielle's problem behavior ranged 58% to 87% of intervals (M = 69%) while her alternative behavior ranged 23 % to 40 % of intervals (M = 30%). Once the written feedback phase began, Danielle's problem behavior decreased in the level with a range of 4% to 31% (M = 17%), and her alternative behavior showed a marked increase in the level with a ranges of 62% to 91% (M = 78%). The levels of both problem and alternative behaviors were stable across sessions.

Likewise, the levels of Carl's problem behavior during baseline were high with a range of 58% to 80% ($M = 71.2\%$) and the levels of his alternative behaviors were low with a range of 8% to 30% ($M = 16.8\%$). When the written feedback was introduced, his problem behavior immediately dropped to 5% to 30% ($M = 20.83\%$) while his alternative behavior dramatically increased to 61% to 94% ($M = 75.5\%$). The data displayed slight variability in the problem and alternative behaviors.

In the audio plus written feedback phase, Danielle's problem behavior was very low in the level with a range of 0% to 12% ($M = 5\%$). The levels of her alternative behavior were very high with a range of 87%-100% ($M = 94\%$). Carl's problem behavior also occurred at very low rates with a range of 5% to 25% ($M = 13.4\%$) while his alternative behavior occurred at very high rates with a range of 73% to 83% ($M = 76.4\%$). His levels of alternative behavior were similar to those of alternative behavior in the first, written feedback phase, but showed a stable trend.

In follow up, the children's levels of problem behavior remained at low rates; 19% for Danielle and 12% (6%-16%) for Carl. Their levels of alternative behavior remained at high rates; 88% for Danielle and 85% (79%-91%) for Carl.

Social Validity

The results of social validity ratings indicated that both the written feedback and oral feedback procedures had high levels of social validity. The overall ratings of acceptability and satisfaction with the feedback procedures were relatively high, with a range of 4-6 ($M = 5$) on a 6-point scale. Ms. Sara rated a 6 for all questions except four questions which received ratings of a 4 or a 5 ($M = 5.7$). Ms. Wendy rated a 6 for the question that asked, if the feedback procedure was practical in a pre-school setting. A 5

was given for 13 questions, and 4 for six questions. The overall mean rating by Ms. Wendy was 4.2.

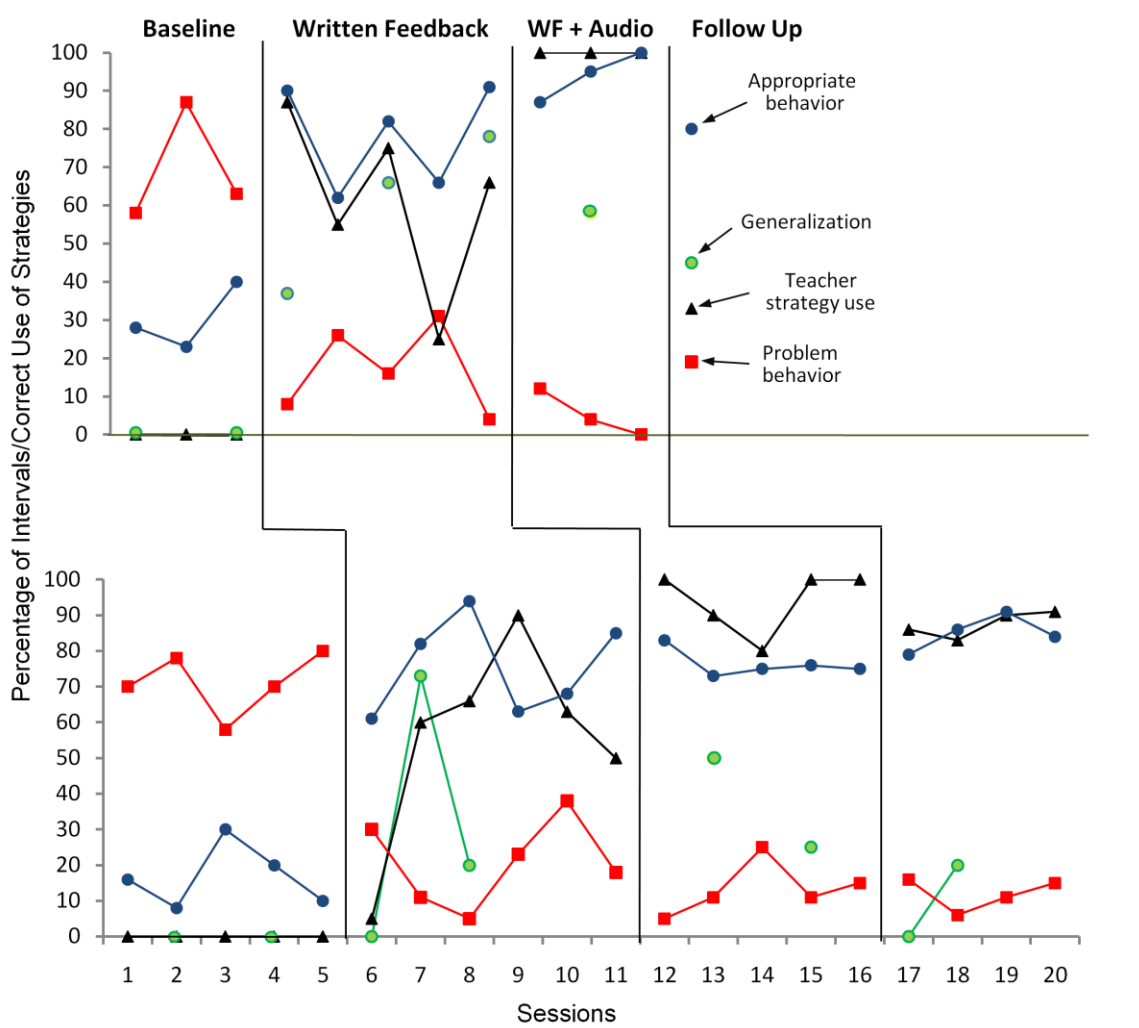


Figure 1. Percentage of teachers' correct use of strategies and percentage of intervals with children's problem behavior and alternative behavior.

Discussion

The purpose of this study was to compare the effects of two feedback procedures: written feedback and written feedback plus audio feedback on two teachers' use of behavior support strategies and two children's problem and alternative behaviors during classroom routines in two community preschool settings. Results indicated that the use of written feedback improved teacher's performance and reduced target children's problem behaviors while increasing their alternative behaviors. The introduction of the audio feedback, combined with the written feedback, further improved the levels of teachers' use of the strategies and the levels of the children's problem and alternative behaviors. In addition, there was some evidence that teachers maintained their use of strategies without feedback procedures and generalized the use of strategies to non-targeted children. The target children also maintained their decreased and increased levels of target behavior during follow-up. The feedback procedures used in the study were rated as acceptable by the teachers.

The findings from the current study support the use of performance feedback in training early childhood educators and improving child behaviors (Barton & Wolery, 2007; Casey & McWilliam, 2008; DiGennaro et al., 2007; Hemmeter et al., in press). With each phase of intervention, changes were seen in teacher and child behaviors.

For dyad 1, during the first phase of intervention, Danielle's alternative behavior dramatically increased above baseline levels and problem behavior decreased below baseline levels. During this phase, Ms. Wendy's use of the strategies with Danielle

showed high variability which was associated with variability in Danielle's target behaviors. However, generalization data rapidly increased during written feedback.

For dyad 2, Ms. Sara's behavior dramatically increased during the written feedback phase, but the feedback did not produce stability in Ms. Sara's use of the strategies for sessions 10 and 11. These data points displayed a downward trend. Carl's problem behavior decreased once the intervention phases began and alternative behavior increased above baseline levels and remained stable although his teacher's strategy use was not stable.

Robust behavior changes were seen in teacher and child behavior once the audio plus written feedback phase began. Ms. Wendy achieved stable responding with scores of 100% for all three sessions. Also, Danielle's problem and alternative behavior achieved stable responding. Ms. Sara's levels of strategy use continued to increase once both the written and the audio feedback procedures were introduced. Carl's challenging behavior reduced slightly lower than the level from the written feedback phase and stability was achieved for challenging and replacement behaviors.

Although data on individual strategies are not presented in the graphs, data showed that Ms. Sara scored 100% correct use of reinforcement strategies for sessions 10 and 11 while using other strategies at low rates in the second phase of intervention. Not all the strategies were needed for her to see desired changes in Carl's problem behavior. As indicated in the literature (Blair, Bos, & Umbreit, 1999; Blair, Fox, & Lentini, 2010; Duda, Dunlap, Fox, Lentini, & Clarke, 2004), this study suggests that some early childhood educators might need to use multi-component strategies to address challenging

behavior and to promote alternative behavior of in young children during on-going classroom routines.

Ms. Wendy's performance showed high variability during the written feedback phase. This could be the result of a couple of different reasons. First, she received the feedback following the observation session instead of immediately prior to the session like dyad 2. Receiving the written feedback immediately before the observation can serve as prompt for the teachers to use the strategies. Next, there were many days due to the teacher or child absences or changes in the classroom schedule that the observations sessions were not conducted and no feedback was given. This caused the sessions not to be consecutive like dyad 2.

Codding, Feinberg, Dunn, and Pace (2005) and Auld, Belfiore, and Scheeler (2010) also delivered feedback following the observation session. In the first study, researchers increased treatment integrity among special education teachers. Auld et al. (2010) trained seven undergraduates to reinforce hand raising among students and withhold attention for talking out of turn. The performance feedback implemented in both of these studies produced stable responding with the participants unlike the results for dyad 1 in the present study. The differences in the findings between the studies could be the participants' pre-service experience. Particularly, the special education teacher participants in Codding et al. (2005) received training in applied behavior analysis four times a year.

Another variable that affects the outcome of performance feedback delivered to teachers might be the severity of the problem behavior in children. Hagermoser (2007) investigated verbal feedback and verbal plus graphical feedback to increase treatment

integrity. The data from this study showed with each phase of intervention teacher's behavior increased and remained stable. However, it should be taken into consideration that in the above study the child's appropriate behavior was already occurring at a high rate of 70%. However, in the present study, baseline for appropriate behavior averaged 30% for dyad 1 and 16.8% for dyad 2. Since the occurrences of alternative behavior were low, the teachers had to put in much effort to implement the strategies.

Scheeler and Lee (2002) and the present study had similar findings in the audio feedback phase. Both studies showed an increase with stable responding when the audio feedback phase was introduced. The follow up data collected showed teacher and child behavior continued to remain stable similar to the follow up data collected in Scheeler, McAfee, Ruhl, and Lee (2006).

There are several key contributions from this study that extend the literature related to performance feedback on teacher implementation of strategies. First, the setting targeted early childhood educators in community preschools (Hundert, 2007). Another contribution made to the relevant literature was teacher implementation of function based strategies (Crone, Hawken, & Bergstrom, 2007). Third, this study examined teacher generalization of strategies (Peck, Killen, & Baumgart, 1989). Lastly, two feedback procedures were evaluated to determine their effectiveness in training preschool teachers.

Limitation and Future Research

One limitation of this study occurred during the written feedback phase for Ms. Sara. Her last data point indicated a downward trend. This phase should have been

extended in order to collect more data to show the effects of the written feedback procedure.

During the written feedback plus audio phase, when in-situ immediate feedback was provided, no data were collected on the type of feedback delivered to the teacher. Data should have been collected on the researcher's delivery of the number of prompt statements, verbal praise, and corrective feedback to determine which type of statement led to teachers increase in performance.

No generalization data for children's behavior was a limitation. Data should have been gathered on non-targeted children's problem and alternative behaviors. Data also should have been collected during untrained routines to see whether teachers could use the strategies throughout the day. However, Ms. Sara did report using the strategies during other routines and activities, but no formal data was collected to measure the teacher and child behaviors. Future research would likely benefit from studies that identified variables that increased teacher's use of the strategies for non-targeted children and across routines. Limited maintenance data was also a limitation of the study. Because of time constraints caused by the child's move to a new program, we collected only one follow-up data for dyad 1.

Another limitation with this study is the timing of the written feedback provided to dyad 1. In the written feedback phase, teacher's levels of strategy use were variable. The teacher requested the feedback meeting be held one hour after the observation session. Both teachers did not receive their feedback meetings at the same time; as a result the intervention conditions were not identical.

Throughout this study, both program directors at the pre-schools had no involvement in selecting strategies and using the feedback procedures. Future studies should evaluate training program directors to use formal feedback to monitor and supervise pre-school teachers in their programs. Giving the responsibility to the directors to oversee and ensure treatment integrity could improve teacher's performance because he/she will be held accountable for correct implementation of the strategies.

Overall, the results of this study are encouraging despite the limitations. The implementation of the feedback procedures were useful in promoting teachers correct use of the behavior support strategies and reducing target children's problem behavior and increasing alternative behaviors.

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