

## **An Evaluation of the Prevent-Teach-Reinforce (PTR) Model in a Community Preschool Classroom**

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<Abstract>

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This study evaluated the use of the Prevent-Teach-Reinforce (PTR) model, an individualized behavior intervention process, with two teachers and two 4-year-old children in a community preschool classroom. A multiple baseline design across routines was employed to assess teachers' implementation of the PTR intervention and changes in child behavior. Additional measures associated with the PTR process and outcomes, such as procedural integrity and social validity, were obtained. The results suggest that the team of teachers implemented the PTR intervention with fidelity, which resulted in the target child's decreased problem behavior and increased engagement in routines or activities. In addition, there was some evidence that the teachers generalized the PTR intervention to a non-target child. The PTR intervention was evaluated as feasible and acceptable by the teachers, and the children's behavioral outcomes and teachers' use of the intervention strategies were evaluated as acceptable by naïve observers.

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Keywords : Prevent-Teach-Reinforce (PTR), problem behavior, positive behavior support, function-based intervention

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Problem behavior is being observed in young children at alarming rates. Between 7% and 25% of preschool aged children are qualifying for a diagnosis of oppositional defiant disorder (Kupersmidt, Bryant, & Willoughby, 2000; West, Denton, & Germino-Hausken, 2000). Young children with persistent problem behavior experience low engagement in classroom activities, fewer opportunities to interact with the teacher and peers, a lack of positive reinforcement, and teacher and peer rejection (Coie & Dodge, 1998). This leads to further exacerbate the problems. Literature indicates that these children are less likely to receive supportive responses from teachers, more likely to be punished for misbehavior, and expelled from preschool programs (Gilliam, 2005).

If these young children do not receive early intervention, they are at greater risk for more severe psychiatric diagnoses, school failure, drug and alcohol abuse, and criminal activities (Coie & Dodge, 1998; Kazdin, 1993; Tremblay, 2000). The literature has consistently documented the developmental continuity of early childhood problem behavior to antisocial behavior in adolescence (Dishion, French, & Patterson, 1995; Shaw et al., 2003). Given the consequences of problem behavior in young children, it is imperative to prepare early childhood educators to address the children's behavioral difficulties in their programs. Interventions for children with persistent problem behavior typically include efforts to identify the nature of behavior and the surrounding environment that influences the behavior through the use of functional behavioral assessment (FBA; Conroy et al., 2005; Wood, Blair, & Ferro, 2009). An approach to address the children's problem behavior which involves a team-based problem solving process and uses the FBA as the basis to design an individualized multi-component intervention plan is Positive Behavior Support (PBS; Carr et al., 2002; Carr, 2007).

Intensive individualized interventions using PBS as a framework have been effectively used for assisting families, educators, and other caregivers to address problem behaviors of children in early childhood settings (Blair, Umbreit, & Bos, 1999; Blair et al., 2007; Duda et al., 2004). PBS uses a multistep approach to develop effective function-based interventions that reduce problem behavior and increase appropriate behaviors (Dunlap et al., 2000). PBS gives priority to social validity and provision of child support in natural daily routines (Carr et al., 2002). Despite that there is a dearth of research using individualized PBS interventions with young children, the few conducted show promise that the PBS approach can be used effectively in community early childhood programs (Blair et al., 1999; Blair, Fox, & Lentini, 2010; Duda et al., 2004; Stormont, Smith, & Lewis, 2007). However, implementing the complex collaborative process of assessment and intervention in typical community settings

would be challenging without practical tools and consultation support. Within and across early childhood settings, there is a great deal of variability in program quality, training and qualification of teachers, and resources available to support the intervention model (Hemmeter & Fox, 2009). This implies that the application of a function-based or PBS intervention model should be focused on developing standardized procedures and materials that are feasible for use by professionals to address the diverse needs of early childhood settings.

The Prevent-Teach-Reinforce (PTR) is a model of individualized PBS and uses a 5-step process (i.e., teaming, goal setting, PTR assessment, intervention, and evaluation) that is team driven, rather than expert-driven and focuses on building a multi-component function-based intervention plan (Dunlap et al., 2009a). The PTR model is a standardized, school-based consultation model that used a randomized controlled trial to evaluate the intervention's efficacy with more than 200 student-focused school-based teams in grades kindergarten through 8th. The process guides the team to identify goals of intervention, come to consensus on hypotheses, develop a behavior intervention plan that is acceptable to the teacher, and provide implementers with the necessary support so they can implement the plan as intended. Results showed that the students who received PTR had significant improvement in their social skills, problem behaviors, and academic engaged time when compared to their counterparts who received typical behavior services delivered in schools (Iovannone et al., 2009). In addition, there is some evidence that this approach may be used as an effective process for young children with disabilities within the home setting (Sears et al., 2013).

Although PTR has shown efficacious outcomes for students in grades kindergarten thru 8th, there is a need for adapting and evaluating the PTR model for use with preschool aged children exhibiting problem behavior. It is unclear from the school-based efficacy trials whether the same individualized, team-based process will hold true for preschool settings in which younger children are served and early childhood educators have substantially lower levels of training and support than do teachers in elementary schools (Granger & Marx, 1992).

Therefore, the purpose of this study was to explore the feasibility and potential efficacy of implementing the adapted PTR intervention model in an early childhood program. Specifically, the study addressed the following research questions: (a) To what extent can early childhood educators implement the PTR intervention with fidelity and generalize those skills to another student; (b) Will there be changes in target behaviors of the children when the teachers implement the behavior support strategies with fidelity; and (c) Will the PTR process be viewed as feasible and acceptable by participating teachers, and the child outcome be viewed

as acceptable by naïve observers?

## I. Method

### 1. Participants

The participants in the study included two children (one target child and one generalization child) of preschool age served in a community preschool classroom and their lead and assistant teachers. The classroom teachers and center director nominated specific students based on the severity of their problem behavior, and each of the children had been exhibiting these problem behaviors for longer than six months. The children's parents also expressed concerns relating to their readiness for a kindergarten program.

Mandy was the target child who was a 4-year-old girl and had attended the program for approximately two years. She lived at home with her biological parents and two sisters, one younger and one older, at the time of the study. She was a typically developing child who had no known diagnoses. However, Mandy frequently spent time by herself and did not engage in classroom activities with peers. She raised her voice, yelled at teachers and peers, and hit peers. Michelle was the generalization child who was a 4-year-old girl and had attended the preschool program for approximately two years.

Michelle was included in the study to examine whether the teachers could develop and implement the PTR intervention with minimal consultation support. Michelle lived at home with her biological parents and older sister. She was also a typically developing child having no known diagnoses. Her communication and other developmental skills were considered normal. Michelle had difficulty staying in her assigned seat, keeping her hands to herself (e.g., hitting peers), and yelling at peers and teachers.

The children's lead and assistant teachers participated in the study. The lead teacher, Danielle, was a 31-year-old female. She recently completed her four-year degree in elementary education at a local university. Her primary internship experience included first and second grade classrooms. She had been with this preschool program for less than eight months. This placement was Danielle's first position after graduation from her collegiate program. She had received no specific training on behavior management or classroom management strategies. The assistant teacher, Tanya was a 19-year-old female with a high school education. She had been

an assistant teacher for over one year and with this particular preschool for five months. Tanya had not received any specific training on classroom management strategies, but had expressed interest in receiving the required training to earn her Child Development Associate (CDA) certification. Her prior work experience had been a 1-1 homecare aide for a teenaged child with an autism spectrum disorder. During initial classroom visits, it was observed that the classroom did not follow a consistent schedule, and both teachers did not use any form of consistent classroom management strategies.

## 2. Setting

The study took place in a private community preschool located in a suburb of a large city in the Southeast. The preschool endorsed the HighReach Learning curriculum which incorporates multiple learning theories and guidelines, including Piaget's Constructivist Theory, Bruner's Theory of Discovery Learning, Bergen's Theory of Play, active exploration, and the most current National Association for the Education of Young Children (NAEYC) Developmentally Appropriate Practice Guidelines. The total number of children served in the classroom ranged from eight to eleven. As the school did not require attendance, the number of children fluctuated depending on the day. The typical classroom schedule included planned group activities, outdoor play, lunch, quiet time, and free play.

The study targeted three routines identified as the most problematic times for gaining the two children's attention. These routines included outside play, transition, and group time. The classroom (25ft x 25ft) contained long connecting tables, chairs, and learning centers (e.g., home living, science, reading, and writing). The outdoor playground (60ft x 20ft) contained one large swing set, two play houses, a tunnel, bicycles, and a variety of age appropriate toys. The outside play routine was conducted in the outdoor play yard. Typical activities the children were invited to participate in included a red light/green light running game, riding wheeled toys (e.g., tricycles), and interacting with the playground equipment. The children were encouraged to play on the playground and interact with their peers for 15-20 min twice per day, once in the morning and once in the afternoon. This study targeted the morning outside playtime. Children were expected to share, take-turns with toys, and wait their turn without the teacher's assistance.

During transition from group activities to outside play, the children were expected to finish their activities and line up. No instructions or activities were provided to the children during

this routine. The teachers would repeatedly say “line up” or call the children by name. The transition time lasted approximately 10 min. Typical activities during group time included playing games (e.g., UNO, matching), reading books, and interacting with specific materials from the curriculum (e.g., oranges - senses). The typical group activity time lasted approximately 10 min. The lead teacher would lead the group time while the assistant teacher was helping the children with activities. Occasionally the assistant teacher would lead the activities. The teachers’ classroom management typically consisted of using verbal reprimands, time-outs, and depriving privileges across routines.

### 3. Materials

A PTR working manual was used to facilitate the PTR process and was provided to each team member involved. This working manual included all forms, excluding the behavior rating scales, from the published Prevent-Teach-Reinforce instruction manual by Dunlap et al. (2009a). A digital video camera was used to record teacher implementation of intervention and child target behaviors. A digital voice recorder was used to record the team meetings to assess the procedural integrity of the PTR process.

### 4. Measures

#### **1) Teacher implementation fidelity**

To assess the degree to which the teachers implemented the selected PTR intervention strategies with fidelity, we developed a task analysis for each component of the intervention for each routine or activity, which consisted of between three and five steps, and data were collected on the percentage of steps completed correctly. Data were collected on the steps that could be heard or observed during actual implementation during the sessions. Seventy-five percent of all sessions in each routine or activity were video recorded. Observers completed a checklist of the relevant steps by reviewing the video recordings.

#### **2) Child problem behavior and engagement**

To examine whether implementation of the PTR intervention resulted in changes in the children’s behavior, we measured problem behavior and engagement in routines. All baseline and intervention sessions were video recorded and analyzed to determine the percentage of

intervals of the target problem behavior and engagement. A 10-s partial interval recording system was used to collect data on child behavior. The target behaviors were operationally defined during the goal setting as part of the first step of the PTR process.

For Mandy, problem behavior was defined as any occurrence of the following: (a) walking away from a planned activity (greater than two feet); (b) screaming or yelling which can be heard from 10 feet away; and (c) hitting or attempting to hit her peers. Mandy's engagement behavior was defined as following sequence of the activity for the majority of the interval, staying within 2 feet of the designated activity area, using a conversational tone of voice, completing tasks, and focusing eyes on the teacher or work materials when the teacher provides instructions. For Michelle, definitions of her target problem behavior and engagement were the same as those of Mandy's with the addition of one additional problem behavior. Demanding excessive adult attention was defined as repeatedly saying the teacher's name (more than two times per activity), pulling at the teacher's arms, or embracing or hugging the teachers.

### **3) Social validity**

Two types of social validity were assessed in this study: a rating by teachers and a rating by naïve observers. Following the termination of the intervention phase, the participating teachers were asked to complete a 15-item questionnaire designed to measure perceived effectiveness and acceptability of the PTR intervention. The questionnaire used a 5-point Likert-type scale, which was adapted from the Treatment Acceptability Rating Form-Revised (TARF-R; Reimers & Wacker, 1988). Two novel observers, a father whose 4-year old child was served in the program, and one female preschool classroom teacher at another community preschool also rated the acceptability of the intervention and the children's behavior. Both the father and teacher were not familiar with the participating children. They were asked to view videotaped sessions of Mandy and Michelle and teaching staff during baseline and intervention conditions and then complete a 6-item, 5-point Likert-type rating scale based on their impressions of the teachers' and children's behaviors. The items on the scale assessed whether the naïve observers found the child's behavior and the strategies used by the teachers were acceptable. Two 4-minute segments from each of the baseline and intervention phases were randomly selected for review and their order was randomly presented for viewing.

### **4) Procedural integrity of PTR process**

The procedural integrity of the 5-step PTR process delivery by the researcher (first author)

was measured throughout the study. Each session or meeting with team members was audio recorded and scored by two independent observers on the implementation of PTR steps. Observers used a 24-item PTR integrity checklist to determine if the researcher addressed all steps necessary during each team meeting. Percentage of procedural integrity was computed by dividing the number of steps addressed by the total number of steps in each session. The results indicated that the researcher completed all steps at 100% during each meeting.

#### 4. Interobserver Agreement

Interobserver agreements (IOAs) were assessed for teacher implementation fidelity, child target behaviors, and procedural integrity measures. IOA was assessed by having two observers independently watch the video-recorded sessions for implementation fidelity and listen to the audio-recorded sessions for procedural integrity. Both observers were master's students in the Applied Behavior Analysis program. IOA was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. IOA for teacher implementation fidelity was conducted for 35% of the sessions. IOA for teacher implementation fidelity was always 100%. IOA for children's target behaviors was calculated for 35% of baseline and intervention sessions across both children. IOA for child behaviors averaged 91.23% (range 75-100%). IOA for procedural integrity was conducted for 100% of the sessions. IOA for procedural integrity was 100%.

#### 5. Design and Procedures

The PTR intervention was tested using a concurrent multiple baseline design across routines (e.g., group time, playground, transition) with one child. The start of the intervention was staggered systematically across routines while data were collected on teacher implementation fidelity and child behavior. Decisions on changing phases were based on the implementation fidelity and child behavior data stability and trend for each routine.

##### **1) Teaming and goal setting**

An initial meeting was conducted to implement the PTR Steps 1 and 2 (Teaming and Goal Setting), which lasted approximately 40 minutes. Before the initial meeting, the researcher made three classroom visits to gather initial information on the current classroom practice and target



children's behavior. During the meeting, the PTR intervention team for Mandy was formed, and each team member's roles and responsibilities was established. Mandy's team included both of her classroom teachers and the researcher (first author). During this meeting, the team completed the *Goal-Setting Form* provided in the manual for Mandy's broad behavioral and social goals. For each goal, the team identified specific target problem behaviors that they would like to see decreased and specific appropriate behaviors targeted for increase. Each target behavior was operationalized. The broad goals for Mandy were active participation in all scheduled activities and interaction with peers in an appropriate manner. This step concluded with a discussion of the timeline for baseline data collection and next steps.

## **2) Baseline data collection**

Following the initial meeting, baseline data on the teacher implementation of their current intervention strategies (i.e., services as usual) and children's target behaviors were gathered across the target routines until the levels of the behaviors showed an increasing/decreasing trend or became stable. Services as usual included verbal redirects (e.g., calling the child's name), verbal reprimands (e.g., telling the child that the behavior is in appropriate or unacceptable) or removing the child from reinforcement (e.g., time-out). Baseline data were collected daily, 10 min in duration during group time and playground and 5-10 min during transition. Transition routine occasionally lasted less than 10 min.

## **3) FBA and PTR intervention planning**

During the second team meeting, the team members participated in the PTR Step 3 (Assessment) and Step 4 (Intervention Planning). The meeting lasted approximately 1.5 hours. They completed the *FBA Checklist* which consisted of questions related to contextual events that occasioned the targeted problem behaviors (i.e., Prevent section), perceived functions of the problem behavior and relevant skills that could be potential replacement behaviors (i.e., Teach section), and responses that typically followed problem behaviors (i.e., Reinforce section). Each team member independently completed a checklist.

The researcher summarized the FBA checklist responses using the *FBA Summary Table* that was broken into Prevent, Teach, and Reinforce sections to develop hypotheses. FBA information identified that Mandy's problem behavior occurred during task or social interaction demand situations across target routines. The consequences most often used after problem behavior during group time, outside play, and transition time were teacher reprimands and time

out. The hypotheses agreed upon by the team were: (a) when teachers presented demands to engage in teacher-directed activities, independent work, or peer cooperative work during group time or to get in line during transition, Mandy gets off-task or screams to delay demands or to get attention from the teacher; and (b) when the activity required interactions with peers during outside play, Mandy hits her peers or yells to get attention from the teacher and peer. After reaching consensus on the hypothesis, the team participated in the PTR Step 4 (Intervention Planning). Strategies were selected from a menu that listed interventions in each component (i.e., Prevent, Teach, Reinforce).

The PTR manual provided strategies for each PTR component. For instance, the Prevention component included providing choices, environmental supports, adult verbal behavior, non-contingent reinforcement, setting event modifications, and peer modeling; the Teach component included replacement behavior/skill (mandated), specific academic skills, problem solving strategies, general coping strategies, specific social skills, self-management, independent responding, increased engagement time, and the Reinforcement component included reinforcement of replacement behavior, discontinued reinforcement of problem behavior, group contingencies, and delayed gratification. After teachers selected two to four strategies by rank ordering under each component, the researcher ensured that those selected matched the hypothesis.

The *Prevention* interventions selected by the team were *Adult Verbal Behavior* (e.g., use of clear verbal statements of what Mandy was expected to do when given a demand or when interacting with a peer, prompt with clear specific language and calm tone of voice, use positive phrasing or make more comments than demands when working with Mandy) and *Increased Noncontingent Reinforcement* (e.g., provide frequent attention in the form of positive comments or allow escaping from tasks when Mandy does not engage in problem behavior). Although curricular modifications and the provisioning of choices were discussed, the category of prevention selected by the teachers focused on adult verbal behavior and noncontingent reinforcement. The strategies selected were perceived as being easy to implement and would accommodate competing demands on the teaching staff, considering recourses available to implement the plan.

The *Teaching* interventions included teaching *Replacement Behaviors* (e.g., asking for assistance, following classroom rules) and *General Coping Strategies* (e.g., controlling anger, expressing feeling). The team determined that the use of Social Stories would be an easy way to teach the skills they wanted Mandy and other children to learn. Four different stories were

developed and used, which focused on teaching how to ask for help, talking about emotions, following rules in school, and personal space. The stories were to be read daily to children at the beginning of group activity time, and the teachers prompted Mandy to use the skills learned through the stories during each target routine.

Finally, the *Reinforcement* interventions selected were *Reinforce Replacement Behavior* and *Discontinued Reinforcement of Challenging Behavior*. The interventions focused on providing positive reinforcement contingent on Mandy’s use of replacement behavior and with holding reinforcement (i.e., attention or escape) for problem behavior. It was planned to provide positive comments upon Mandy’s engagement in activities or routines and initiation and use of

<Table 1> PTR intervention steps developed for group activity time

Steps in Each PTR Component
<p>PREVENT</p> <ol style="list-style-type: none"> <li>1. Prepare Mandy for the activity by providing a clear verbal statement of what she is expected to do (e.g., sit in her seat, use a paper, draw a picture of “x”).</li> <li>2. Provide verbal prompt to initiate the activity using clear language (e.g., “First, finish your work, then play”) and calm tone of voice.</li> <li>3. Remind Mandy of the routine expectations using positive phrasing during activities (e.g., “Use quiet voices”).</li> <li>4. Provide frequent positive comments on Mandy’s engagement in the activities.</li> </ol> <p>TEACH</p> <ol style="list-style-type: none"> <li>1. Teach to ask for help, stay within the boundary, control anger and express emotions, and follow class rules by reading Social Stories with Mandy.</li> <li>2. Ask Mandy if she has any questions upon reading the stories.</li> <li>3. Provide verbal complements for reading the stories together.</li> <li>4. Prompt or remind of using replacement behavior or coping strategies if Mandy is about to engage in problem behavior.</li> </ol> <p>REINFORCE</p> <ol style="list-style-type: none"> <li>1. Upon Mandy’s use of new replacement skills, provide verbal complements.</li> <li>2. If Mandy attempts to use the problem behavior to delay demands or to gain access to attention, remind her of class rules or routine expectations and provide alternatives; praise for choosing an alternative.</li> <li>3. If Mandy continues to engage in the problem behavior, be calm about the problem behavior; temporally withhold attention while ignoring problem behavior.</li> </ol>

the replacement skills learned through Social Stories, and temporarily withhold attention when the problem behavior escalated. The strategies were perceived as being easy to implement and would accommodate the competing demands on teaching staff, considering recourses available to implement the plan. <Table 1> presents an example of the intervention steps developed for group activity time and used for assessing the fidelity of implementing the intervention steps by teaching staff.

#### **4) Training**

During the third meeting, the researcher provided a 45-minute training to teachers using behavioral skills training procedures that included instructions, modeling, rehearsal, and feedback on the specific skills selected in the intervention. After instruction, the researcher modeled the use of the intervention strategies in a role-play context. The researcher then had the teachers rehearse implementation of intervention steps while providing praise for correctly performed steps and corrective feedback for incorrectly performed steps. During training, both teachers accurately implemented each step with 100% accuracy. The length of the training was determined by the interventions selected and the steps determined through the task analysis.

#### **5) Intervention implementation**

Both the lead and assistant teachers participated in implementing the intervention. As shown in the graphical data in the Results section, the lead teacher implemented the intervention during the first target routine, outside play. The teachers implemented the intervention during the outside play routine for only two days, as the children did not continue to go to the outside play area due to excessive heat, which could result in possible risks to the children. Implementation of the intervention by the lead teacher was discontinued during the intervention phase due to termination of her employment at the program. Data on the lead teacher fidelity during transition and group times and during generalization assessment were collected for only one day. The researcher provided prompts to teachers via cell phone text to read the Social Stories daily. In addition, the researcher provided the teachers with feedback on their implementation of intervention steps and reviewed child progress data with them at the end of each implementation session. Intervention data were collected 2-3 days per week.

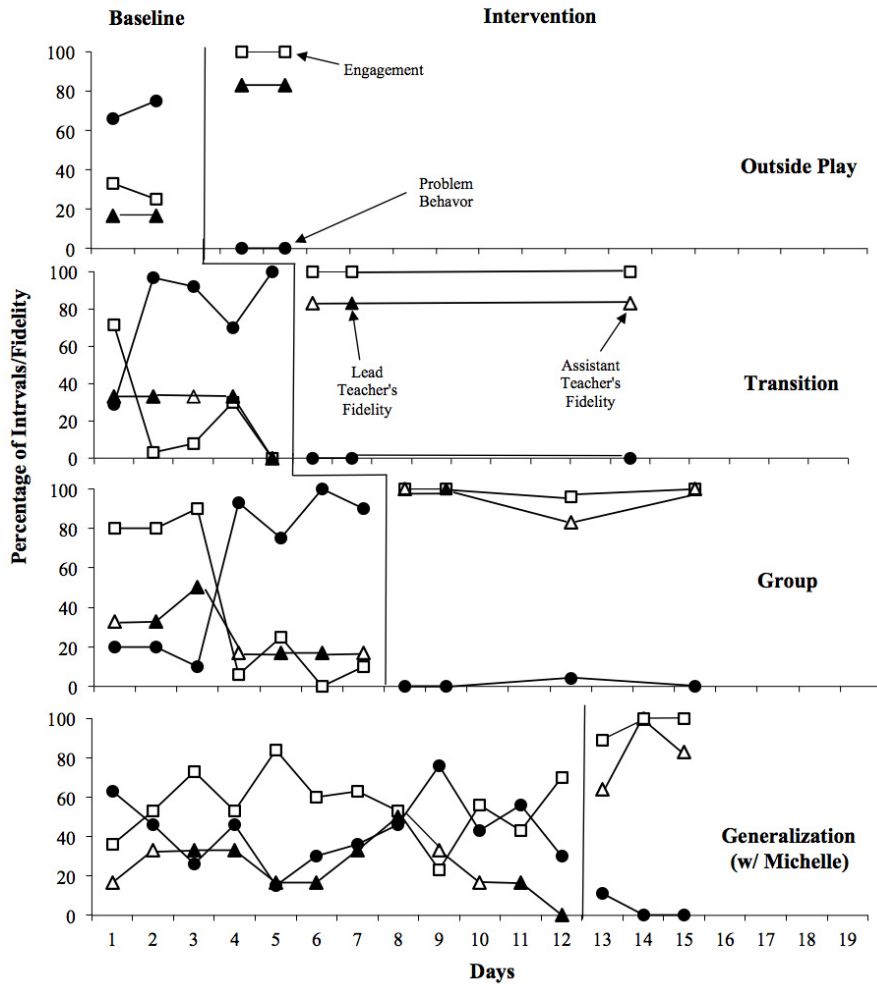
## **6) Generalization**

Upon completion of each PTR step, the teachers were encouraged to design and implement the PTR intervention with a non-target child, Michelle, with minimal support from the researcher. They defined Michelle's target behaviors, assessed Michelle's behavior, developed hypotheses, and designed an intervention plan using the FBA Checklist, FBA Summary Table, and suggested strategies in the manual. The teachers chose group time as the target routine for Michelle. Behavioral and social goals and intervention strategies selected for Michelle were almost the same as those developed for Mandy due to the similar problem behavior and functions. The researcher provided feedback on the hypotheses and strategies developed for Michelle, but did not provide coaching or feedback to the teachers during intervention. Generalization data were collected throughout the experimental phases to examine the teachers' use of the intervention strategies with Michelle.

## **II. Results**

### **1. Teacher Implementation Fidelity**

<Figure 1> presents data on the use of PTR strategies by teachers across three target routines for Mandy and the generalization assessment with Michelle in one routine. During baseline sessions, teachers used a limited number of intervention strategies. However, as shown in <Figure 1>, the teachers' levels of intervention implementation were above 80% across all activities during intervention, indicating that they used the selected intervention strategies effectively with Mandy. The teachers' implementation fidelity increased from an average of 16.7% in baseline to 83% in intervention during outside play, from 26.4% to 83% during transition, and from 26.1% to 95% during group time. The fidelity ranged between 0% and 50% in baseline and between 80% and 100% in intervention; none of the intervention data points overlapped with baseline data points.



〈Figure 1〉 Percentage of intervals with problem behavior and engagement for Mandy and Michelle and percentage of teacher implementation fidelity across phases and routines.

## 2. Child Behavior

During outside play routine, Mandy's problem behavior averaged 70.5% of intervals whereas engagement averaged 29% in baseline. In intervention, her problem behavior immediately decreased to 0% and her engagement increased to 100% of intervals across days. During transition, Mandy's problem behavior averaged 77.4% of intervals and engagement averaged 22.5% of intervals in baseline, showing an increasing trend for problem behavior and a decreasing trend for engagement. In intervention, her problem behavior decreased to 0% and

engagement increased to 100% of intervals over consecutive days. None of the intervention data points overlapped with baseline data points for both target behaviors. During the group time, the same patterns seen in outside play and transition routines were observed. Mandy's problem behavior averaged 58.3% of intervals whereas engagement averaged 41.6% of intervals in baseline, showing an increasing or decreasing trend. During the intervention almost no problem behavior occurred and her engagement increased to 96.3% of intervals.

### 3. Generalization

Generalization data collected during group activities showed that both teachers implemented the intervention with fidelity for Michelle. As shown in <Figure 1>, the teachers implemented 25% of the intervention strategies in baseline, and their use of strategies increased to an average of 82% in intervention. Michelle's problem behavior averaged 42.8% in baseline. However, her problem behavior decreased to 3.6% during intervention. Her engagement behavior increased from 55.6% in baseline to 96.3% in intervention. Michelle's problem behavior and engagement data showed some variability in her rates during baseline, fluctuating between low and high levels, but upon intervention a change in level for problem behavior and engagement were immediate. The data show evidence that teachers generalized their use of PTR strategies to the non-target child.

### 4. Social Validity

During the last team meeting, the two participating teachers completed a social validity questionnaire. The teachers' ratings on the social validity rating scale showed that the levels of acceptability of the intervention were relatively high. The overall mean ratings of acceptability and satisfaction with the PTR intervention process were 3.7 on a scale of one to five by lead teacher and 4.5 by assistant teacher. Both teachers responded that they were very willing to carry out the behavior plan and change the routines in order to carry out the plan. Both teachers responded neutrally to there being disadvantages to following the plan and their observing any undesirable side effects as a result of the behavior plan. The lead teacher responded that the behavior plan was somewhat effective in reducing problem behaviors and in teaching the child appropriate behaviors, and that the goal of the intervention somewhat fit with the team's goal for improvement of the child's behavior. The assistant teacher felt more

strongly in the positive sense for each of the lead teacher's responses.

The social validity ratings by naïve observers showed that both observers rated the participating children's behaviors as relatively being unacceptable and the teachers appeared to be having a difficult time in the routines during baseline. However, they responded that during intervention the children's behaviors were acceptable and the teachers appeared to be comfortable in the routine, and that the children were participating in the routine appropriately. The naïve father felt that the teachers were comfortable, using practical procedures, and their strategies appeared to be working. The ratings by the parent were 2.5 on a scale of one to five for both routines in baseline and 3.6 for transition and 4.7 for outside play in intervention. Overall ratings by the teacher were 1.6 for transition and 2.5 for outside play in baseline, and were 3.6 for transition and 5.0 for outside play in intervention.

### III. Discussion

This study examined the feasibility of implementing the PTR model in a local community preschool classroom. As anticipated, the study demonstrated positive results. The results suggest that preschool classroom teachers successfully implemented the PTR intervention, which resulted in improvement in a target child's problem behavior and engagement in routines. In addition, there was some evidence that the teachers generalized the PTR intervention to a non-targeted child. Both children successfully engaged in routines as a result of the intervention; significant changes in their problem behavior and engagement in activities over time were noticeable. The PTR intervention was evaluated as feasible and acceptable by the teachers, and the children's behavioral outcomes and teachers' use of the strategies were evaluated as acceptable by naïve observers.

The data from this study have extended the current PTR evaluation by Dunlap et al. (2009b) and Strain, Wilson, & Dunlap (2011) in kindergarten and elementary schools by using the PTR process with preschool aged children in a community preschool program. The findings from the current study support the use of function-based intervention and PBS in community early childhood settings (Blair et al., 1999; Blair et al., 2010; Duda et al., 2004; McLaren & Nelson, 2009). During baseline, it was noted that the teachers rarely used selected intervention strategies, but did demonstrate high levels of implementation of the multi-component interventions that included evidence-based strategies.



A variable that affects the process and outcome of function-based or PBS intervention is the teacher skills required to conduct FBA and design and implement multi-component intervention plans (Conroy et al., 2000). Previous studies suggested that even the school-based consultants had difficulty linking FBA to intervention (Crone, Hawken, & Bergstrom, 2007; Van Acker et al., 2005). Considering that early childhood educators in community settings have substantially lower levels of training and support to address problem behavior in young children (Hemmeter et al., 2007), this study suggests that it is essential to provide training and consultation by experts to early childhood educators in the process of selecting appropriate prevention, teaching, and reinforcement strategies based on FBA results (Blair et al., 1999; 2010; Schepis et al., 2000). In this study, it was emphasized that the teaching staff be trained and coached through performance feedback during intervention as a critical element to enhance teacher skills and to ensure teacher implementation fidelity as well as generalization (Blair et al., 2010; Casey & McWilliam, 2008).

An encouraging result of the study was the successful implementation of the intervention by both teachers who served the participating children in the classroom. Their consistent implementation of the intervention across target routines resulted in significant improvement of the children's target behaviors. Their active involvement in all aspects of the PTR process to address the children's problem behavior contributed to immediate change in the children's behavior. However, toward the end of study, the lead teacher who had more training background and teaching experience left the program in pursuit of a position in a public school setting. The program director also resigned her position to assume a teaching role in the public school system. Both children in this study were subjected to many staff changes in their eight months prior to the study and that continued throughout the course of the study.

Considering the high staff turnover and limited resources in community early childhood settings to implement behavioral interventions, this study suggests that the behavior support team develop intervention steps that are effective and easily implemented by early childhood educators who have diverse training backgrounds. When the intervention steps are easy to implement, all classroom staff might be able to implement the intervention without extensive training. The teachers in the study selected interventions that they indicated were the easiest to implement including the use of clear specific verbal instructions and increasing their levels of reinforcement for the children's appropriate behavior. Prior to the intervention, teachers would call the children by name when they engaged in problem behavior, but failed to provide them with directions and paid little attention to the appropriate behaviors.

It is important to recognize that while every function of both children's problem behavior was not specifically addressed, the teachers were still able to select intervention strategies that worked in this case. For example, one of the functions of Mandy's problem behavior was found to be delaying task demands, but the strategies of modifying tasks to reduce task demands or providing negative reinforcement contingent upon completion of task were not included in the intervention strategies. Although the researcher or another behavior analyst might not initially select the intervention strategies chosen by the teachers, the strategies selected by the teachers were valued, considering they were the persons implementing the strategies. To ensure successful implementation of intervention strategies, it was considered important to select strategies that would encourage teacher buy-in.

While this study appears effective for the two students and teachers, it is not without its limitations. First, the parents did not participate as part of the team. Often, we find that children in childcare settings do not have attendance requirements like that of the school system and parents may not be able to take time off of work to participate in meetings. Second, we were unable to obtain more than two baseline and intervention data points for Mandy during outside play due to hot weather and an urgent need for intervention. Although changes in levels for problem behavior and engagement were immediate upon intervention and she engaged in the routine without any problem behavior in intervention, more data are required to demonstrate experimental control.

In addition, both Mandy and Michelle had a variety of absences, which resulted in limited data collection during intervention across routines. Intervention phases should have been extended in order to collect more data to show the maintenance of the PTR intervention without the researcher involvement. Follow-up data could have been collected to demonstrate long-term outcomes of the intervention. Third, due to the absences, including a complete replication across routines with Michelle was not possible to further assess teacher generalization. Despite its limitations, this study demonstrates positive results that early childhood teachers in a community preschool setting can implement the PTR model with consultant support. This extension of the original PTR evaluation is promising, not only because it adds to the use of PTR, but also because it is an effective way for teachers to learn how to help young children in their classrooms.

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## 지역사회 내 유아학교 학급에서의 Prevent-Teach-Reinforce 모형 적용 평가

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본 연구는 지역사회 내 한 사립 유아학교의 학급 교사 두 명과 4세 유아 두 명을 대상으로 개별화 행동 중재 과정 모형인, Prevent-Teach-Reinforce (PTR) 모형을 적용한 후 유아학교에서의 그 모형 적용 가능성 및 모형의 잠재적 효과성을 알아보는데 초점을 둔 것이다. 단일사례연구 설계 중의 하나인 일과활동간 중다기초선 설계를 사용하여 팀 중심의 PTR 과정을 통해 개발된 PTR 행동중재를 교사가 실행한 것이 대상 유아의 행동 변화에 어느 정도 영향을 주는지 알아보았고, 추가적으로 연구자의 PTR 과정의 단계적 실행에 따른 절차충실도 및 중재의 사회적 타당도 또한 알아보았다. 연구결과, 교사들에 의한 PTR 중재 실행 충실도는 높았고, 교사들이 실행한 중재는 대상 유아의 문제행동을 감소시키고 일과 및 활동의 참여행동을 증가시키는데 긍정적인 영향을 준 것으로 나타났다. 교사들은 중재의 표적이 되지 않았던 유아에게도 PTR 중재를 적용하면서 PTR 중재의 일반화 가능성을 보여주었다. 참여 교사들은 PTR 중재가 적절하고 수용가능한 것으로, PTR 중재의 사회적 타당도는 비교적 높은 것으로 평가를 해 주었으며, 연구 참여 유아들과 연구에서 적용한 PTR 모형을 알지 못하는 두 명의 관찰자 또한 PTR 중재의 사회적 타당도는 높은 것으로 평가를 해 주었다.

〈주제어〉 Prevent-Teach-Reinforce (PTR), 문제행동, 긍정적 행동지원, 기능중심중재

게재 신청일 : 2015. 07. 05

수정 제출일 : 2015. 07. 23

게재 확정일 : 2015. 07. 24

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