Psychology in the Schools, Vol. 48(7), 2011
View this article online at wileyonlinelibrary.com/journal/pits

DOI: 10.1002/pits.20587

FUNCTIONAL ASSESSMENT AND POSITIVE SUPPORT STRATEGIES FOR PROMOTING RESILIENCE: EFFECTS ON TEACHERS AND HIGH-RISK CHILDREN

KAREN CALLAN STOIBER

University of Wisconsin-Milwaukee

MARIBETH GETTINGER

University of Wisconsin-Madison

The purpose of this study was to conduct an experimental analysis of teachers' use of functional assessment (FA) and positive behavior support (PBS) for addressing challenging behaviors in young children. A group of 35 experimental teachers participated in professional development designed to provide step-by-step training and guided implementation of FA linked to PBS intervention planning for children identified with challenging behavior in prekindergarten through first-grade classrooms. A randomly designated group of 35 control teachers received neither training nor consultation for implementing FA and PBS. At post-intervention, experimental teachers reported increased resilience as evidenced in their significantly higher competence and self-efficacy along with greater utilization of FA and PBS practices compared with control teachers. Increased levels of resilience were also documented on multiple measures for experimental children with challenging behaviors who received FA and PBS. Specifically, experimental children demonstrated more positive behaviors and fewer challenging behaviors compared with control children at post-intervention. The findings offer empirical support for providing professional development in FA and PBS as a proactive strategy for promoting improved competence for teachers and, more importantly, for improving resilience among children with behavioral concerns. © 2011 Wiley Periodicals, Inc.

It is estimated that as many as 20% of preschool through first-grade children (ages 4-7 years) exhibit challenging behaviors, such as noncompliance, aggression, or disruptiveness, that limit their ability to learn and interfere with productive classroom instruction (Feil, Walker, Severson, & Ball, 2000). Teachers indicate that educating children with behavior problems is one of the most difficult and stressful aspects of their jobs (Bushaw & Gallup, 2008), with many teachers indicating this difficulty as a key reason for leaving the teaching profession (Gonzalez, Brown, & Slate, 2008). Many early educators do not have adequate training and lack the knowledge and skills necessary to accommodate students with challenging behavior in their classrooms (Stoiber, Gettinger, & Goetz, 1998; Sugai & Horner, 1999). Teachers report feeling ill-equipped to meet the needs of children who are disruptive and indicate being frustrated in their attempts to develop safe and nurturing classroom environments (Gettinger, Stoiber, Goetz, & Caspe, 1999). The fact that teachers need more support in the area of effectively managing children's challenging behavior is further supported by a recent study indicating that school psychologists reported classroom-based behavioral interventions as their greatest need area for professional development (Stoiber & Vanderwood, 2008).

The difficulties teachers experience in managing challenging behavior in young children is especially noteworthy because if unaltered, such behavior often leads to significant academic, work, and social-emotional difficulties during adolescence and adulthood (Dishion & Patterson,

This work was supported in part by the Office of Special Education and Rehabilitation Services, Office of Special Education Programs, U.S. Department of Education. The contents do not necessarily represent the positions or policies of the Office of Special Education and Rehabilitation Services, the Office of Special Education Programs, or the U.S. Department of Education, and endorsement by the federal government should not be assumed. We extend special thanks to Margaret Hildebrand Fitts, Heather McIntyre, Kelly Jerden, Kristy Kohler, and Erin Cowell for their assistance with data collection and analyses. We dedicate this article in memory of Michelle A. Miller, without whose tremendous dedication and assistance this study would have been possible.

Correspondence to: Karen C. Stoiber, University of Wisconsin-Milwaukee, Department of Educational Psychology, 2400 E. Hartford Ave., Milwaukee, WI 53211. E-mail: kstoiber@uwm.edu

1999; Fergusson, Horwood, & Ridder, 2005; Greenberg, Kuche, & Riggs, 2004). Furthermore, behavioral interventions that are not implemented until after Grade 3 frequently have limited long-term benefits (Hamre & Pianta, 2001). The gap in teacher repertoires for dealing with problem behaviors, combined with the long-term negative outcomes associated with behavioral challenges in young children, underscores the need to investigate "what works" (i.e., to determine evidence-based practice [EBP]) as preventative and early intervention for this group of at-risk children. EBP refers to those practices proven to be effective in improving child outcomes based on prior research findings or data-based decision making (Stoiber & DeSmet, 2010; Stoiber, Lewis-Snyder & Miller, 2005).

As a result of recent conceptual and empirical developments, functional assessment (FA) combined with positive behavior support (PBS) has emerged as one example of what works in promoting social competence and social−emotional resilience among students in school settings (Dunlap et al., 2006; Ingram, Lewis-Palmer, & Sugai, 2005; Merrell, 2008). Within a FA framework, the key to effective practice is to understand variables that reliably predict and maintain children's problem behavior *prior* to the design and implementation of interventions. Knowledge of the function underlying behavior guides the design of intervention strategies that accommodate the unique needs of children with behavioral challenges. Furthermore, knowledge of classroom variables that "trigger" problem behavior contributes to the development of behavioral support strategies that are preventive. Specifically, information obtained through FA enables practitioners to design classroom environments that both minimize the occurrence of problem behaviors and promote the development of positive behaviors (Ellingson, Miltenberger, Stricker, Galensky, & Garlinghouse, 2000; Marquis et al., 2000; Merrell, 2008). In this regard, FA combined with PBS is viewed as useful for developing more positive adaptation or resilience in children with challenging behaviors. Because of the varied and complex factors leading to their challenging behaviors, without a systematic focus on increasing the social competence and resilience in these children, they are faced with difficulties that might otherwise lead to significant social and emotional problems, such as anxiety, peer problems, and aggression. *Social competence* is conceptualized as a multicomponent construct that allows the child access to desirable social relations, conditions, and situations (Stoiber, 2004), which promotes their capacity to be *resilient*, or to develop positive adaptation or "bounce back" when faced with difficulties and cope effectively (Luthar, 2000; Merrell, Levitt, & Gueldner, 2010).

To date, the evidence base for FA has been limited primarily to single-participant designs and case studies, with most research investigating its use with children exhibiting severe behavioral problems or adults with developmental disabilities (Alter, Conroy, Mancil, & Haydon, 2008; Ellingson, Mittenberger, Stricker, Galensky, & Garlinghouse, 2000; Ingram et al., 2005; O'Neill et al., 1997; Scott, DeSimone, Fowler, & Webb, 2000; Stage et al., 2006; Stoiber, Gettinger, & Fitts, 2007). Despite limited research to guide implementation in typical classroom situations, experts agree that the primary purpose of FA should be to enhance students' success in general education classrooms (Chandler & Dalhquist, 2002; Horner, 1994; Safran & Oswald, 2003; Scott & Kamps, 2007). Students who are at risk for social or behavioral problems typically do not require highly specialized, intensive intervention but rather need interventions that directly target their specific risk factors (Merrell et al., 2010). Thus, school-based psychologists and other practitioners strongly endorse the use of FA procedures for chronic, less severe behavior problems such as talking out or being disruptive in class (Nelson, Roberts, Rutherford, Mathur, & Aaroe, 1999; Sasso, Conroy, Strichter, & Fox, 2001; Stoiber, 2004). Myers and Holland (2000) reported that only 12% of educators, however, had received specific training related to FA and PBS planning, and very little is known regarding the implementation of FA by teachers or school-based teams (Ingram et al., 2005). Other researchers have voiced similar concerns about the lack of practical approaches to guide the design of effective PBS plans (Ervin et al., 2001; Gresham, 2002). In particular, many practitioners

are unclear about how to explicitly link intervention plans to the underlying function or intent of the challenging behavior (Sugai & Horner, 1999).

Promoting the implementation of EBP, such as FA and PBS planning, requires researchers to conduct experimental investigations of procedures within the context of naturalistic school settings and to investigate ways to maximize teachers' utilization of knowledge or research findings (Kratochwill & Shernoff, 2004; Stoiber & Kratochwill, 2000). Two distinct types of knowledge utilization in education have been identified (Estabrooks, 1999; Hood, 2002), which would appear to promote resilience in educators so that they can cope effectively when faced with the difficulty of teaching children with challenging behavior. Specifically, *conceptual* use of research findings is reflected in a change in teachers' thinking or beliefs about how to intervene; *instrumental* use is the direct application of research findings reflected in classroom practices and, ultimately, leads to improved student outcomes (Estabrooks, 1999). Although opportunities to develop conceptual knowledge of EBP through didactic training are necessary for EBP implementation, this type of professional development is not sufficient in moving practitioners toward changes in classroom practices (Hood, 2002). As Newman and Vash (1994) noted almost 2 decades ago, "experience shows that possession of information [conceptual] does not mean it will be used [instrumental]" (p. 381). To be evidence-based practitioners, educators must demonstrate instrumental use of knowledge, which should help their students exhibit meaningful change in targeted classroom performance (i.e., develop social competence and resilience). Promoting instrumental knowledge utilization requires professional development that allows teachers to apply new knowledge in relevant contexts (e.g., classrooms), with frequent feedback and support (Hood, 2002; Garet, Porter, Desimore, Birman, & Yoon, 2001).

In sum, to support the utilization of FA and PBS planning, field-based empirical demonstrations are needed whereby practices are implemented within a school setting by teachers and other school professionals. In addition, there is a need to promote both conceptual and instrumental knowledge utilization related to FA and PBS (Dunlap et al., 2006; Hundert, 2007). The current study was designed to meet these research needs. First, an experimental program that incorporated FA and PBS was evaluated over a 2-year period in prekindergarten, kindergarten, and first-grade classrooms using a randomized experimental-control group design. Second, the study examined the effects of professional development related to FA and PBS in terms of both conceptual change (i.e., teacher knowledge and self-efficacy beliefs) and instrumental change (i.e., classroom practices) among teachers. A major assumption of professional development is that conceptual changes in teacher knowledge and instrumental changes in teacher practices will lead to their being more resilient and to improved outcomes for a targeted group of students (Rosenfield, 2002). Thus, changes in social competence and resilience in at-risk students resulting from the implementation of FA and PBS also were examined.

Purpose of Study

The purpose of this study was to conduct an experimental analysis of teachers' use of FA and PBS for addressing challenging behaviors in young children. The study had three primary objectives. The first was to determine the extent to which professional development (combining didactic training, guided implementation, and feedback) was effective in bringing about positive change in educators' (a) knowledge of FA and positive support strategies, and (b) self-efficacy beliefs regarding accommodation of children with challenging behaviors. The second objective was to evaluate the effects of professional development on teachers' classroom practices as evidence of their resilience. The third objective was to examine the impact of FA and PBS on the occurrence of both challenging and social competent behavior among targeted students in classroom settings.

In addition to examining both teacher resilience outcomes (conceptual and instrumental knowledge utilization) and student resilience outcomes (including social competence), the current study extends the evidence base for FA and PBS interventions in three important ways. First, the majority of prior research examining the benefits of FA in school settings has relied on an expert consultation model in which a specialist trained in FA implements the key procedural components, including observing the child, consulting with the teacher, and offering suggestions for classroom modifications and strategies (Chandler, Dahlquist, Repp, & Feltz, 1999). As such, teachers may continue to depend on consultation from a specialist for each child in need of intervention for challenging behaviors (as opposed to developing their own capacity to be resilient and function effectively), or they may apply strategies that are ineffective. In the current study, educators implemented FA and positive support planning for one student within an expert consultation model; that is, the authors provided ongoing support to assist teachers and school-based teams in conducting a FA and using assessment information to develop PBS plans. For a second student, however, teams conducted FA, developed a behavior support intervention plan, and implemented the intervention strategies independently, without consultative support. This component permits insight into the potential long-lasting and indirect impact of consultative support, which is often provided by school psychologists, on teachers' development and the use of intervention strategies for other children with challenging behavior they later encounter (but do not receive support through consultation).

Second, the study examined the effects of functionally derived interventions in promoting the development of social competence among students. Previous researchers investigating the effects of FA have typically focused on a reduction in problem behaviors, such as off-task behavior, noncompliance, and aggression, rather than examining the effect on children's development of positive behaviors or competencies. In the current study, we assessed the occurrence of both challenging and positive behaviors among children who were targeted for intervention. Finally, as noted earlier, most research on FA has occurred with individuals with severe disabilities rather than with students who exhibit mild behavioral challenges in regular education classrooms. The intent of the present study was to foster teachers' use of function-linked understandings of underlying behavioral intents in designing individualized preventative interventions rather than to promote their use of "functional analysis" techniques or functional behavioral assessments that are mandated by Individuals with Disabilities Education Act (IDEA) or used with students with severe behavioral problems or emotional disorders (Alter et al., 2008; Bear, 2009; Scott & Kamps, 2007; Stoiber, 2004). In this study, general education teachers implemented a more broadly defined, *preventative* method of FA and PBS for children without identified disabilities but who were at risk for more severe difficulties.

Method

Teacher Participants

Prekindergarten, kindergarten, and first-grade teachers were recruited as potential participants by contacting the directors of special services or district administrators in four school districts that serve predominantly Caucasian, middle-income communities located in southeastern Wisconsin. Total enrollment for each district ranged from 3,500 to 4,500 students and included less than 10% students from racial-ethnic minority groups. Schools within each participating district had building support teams that met weekly to address individual teacher referrals. During the 2-year period in which the study was conducted, building teams continued to function in their usual manner in each school. For experimental schools, the FA and intervention procedures supplemented, but did not replace, the existing team process.

The original research design called for random assignment of classrooms within school districts to either experimental or control conditions; however, administrators agreed to participate only if

all classrooms within their district were assigned to the same condition. Thus, school districts (not classrooms) were assigned at random to participate in the experimental program ($n = 35$ teachers) or to comprise the control group ($n = 35$ teachers). Teacher participants were non-Hispanic, white females, with the exception of one male in the experimental and two males in the control group. The mean years of experience was 13.92 (standard deviation [*SD*] = 5.93) for the experimental group and 11.44 years (*SD* = 8.46) for the control group. No teacher reported having received formal training in FA or PBS prior to the initiation of the study.

Student Participants

Student participants included 90 children (4–7 years of age) in prekindergarten, kindergarten, and first-grade classrooms of participating teachers. Of these, 57 were students of teachers who participated in the experimental program, and 33 were students of control teachers.

Teachers in the experimental group nominated two children with challenging behavior from their classrooms to participate. Challenging behaviors were described as behaviors that interfere with children's learning and adjustment, such as being disruptive, noncompliant, or aggressive. Teachers were directed *not* to nominate children who engaged in excessively destructive or dangerous behaviors (e.g., self-injurious behavior or property destruction). Within each experimental classroom, one nominated child with challenging behavior was randomly designated as the target child (TARGET); this student was the focus of FA and PBS procedures implemented by teachers and school-based teams, with the assistance of expert consultation and training provided by the authors. The second nominated child was the generalization child (GEN); this child was the focus of the experimental approach (FA + PBS) that was implemented independently by teachers and teams without consultative support from the authors. The reason for identifying GEN children was to examine the extent to which trained educators were able to effectively implement EBP and function effectively without ongoing consultation and assistance from specialists. Finally, teachers in the control classrooms nominated one child who exhibited challenging behaviors to participate. These children comprised the control group (CONTROL).

Parental consent was requested for all nominated students. Of the total 105 children nominated across experimental and control teachers, parents of 33 TARGET, 24 GEN, and 33 CONTROL children provided consent (86% of nominated children). Table 1 reports the number of boys and girls in each group, as well as the number of children by grade/age: prekindergarten (4–5 years), kindergarten (5–6 years), and first grade (6–7 years). Table 1 also includes global ratings provided by teachers to indicate the severity of their concerns about children's academic and behavioral functioning (1 = no concern; 4 = moderate concern; 7 = extreme concern). These ratings served as a cross-check for the teacher-nomination procedure and provided evidence that the severity of concerns was similar between experimental and control children. As seen in Table 1, teachers expressed moderate to extreme concerns about the behavioral and academic performance of children with challenging behaviors in the experimental (TARGET, GEN) and control (CONTROL) classrooms; severity ratings did not differ among the three groups.

Experimental Procedures

The experimental program incorporated a five-step procedure (see Table 2) that was implemented collaboratively by classroom teachers, school psychologists, and other members of their school-based teams (e.g., speech and language therapist, special educator, social worker, counselor). Although classroom teachers were the focus of this study, all team members participated in the professional development sessions and worked collaboratively to implement assessment and intervention procedures. Specifically, experimental teachers (and teams) followed manualized procedures for

Table 1
Characteristics of Child Participants

	Experimental Subgroups		
	TARGET ($n = 33$)	GEN ($n = 24$)	CONTROL ($n = 33$)
Gender:			
Male	27 (82%)	16 (67%)	23 (70%)
Female	6 (18%)	8 (33%)	10 (30%)
Grade:			
Prekindergarten	5 (15%)	5 (21%)	16 (48%)
Kindergarten	16 (48%)	7 (29%)	10 (30%)
First grade	12 (36%)	12 (50%)	7 (21%)
Global Rating [a]			
Academic	3.93 (1.92)	3.45 (2.06)	4.00 (1.77)
Behavioral	5.77 (1.46)	5.36 (1.36)	6.25 (0.71)

[a]Means and *SD*s (in parentheses) are presented; possible range = 1 (no concern) to 7 (extreme concern).

conducting FAs and designing PBS plans for individual children. Table 2 provides an overview of the five procedural steps, with a description of the objectives or outcomes for each step. In addition to a procedural manual, implementation was guided by a structured record form. The record form specified each activity listed in Table 2 and was used to summarize the results of the FA (including the hypothesized function of behavior), develop an intervention plan with positive support strategies linked to assessment results, and monitor implementation and progress. Two cycles of eight study phases (explained below) were implemented sequentially over a 2-year period. The first year (Cycle 1) included 14 experimental and 15 control classrooms; the second year (Cycle 2) included 21 experimental and 20 control classrooms. The eight implementation phase cycles conducted during the study are as follows:

Phase 1—Child Participant Selection and Pre-Intervention Assessment (2 Weeks). Teachers nominated children for participation and completed behavior rating scales for all children for whom parental consent was obtained (see Child Outcome Measures in Table 2). Teachers also completed self-ratings of their knowledge and skills related to FA and PBS and self-efficacy beliefs about accommodating children with challenging behaviors in their classrooms (see Teacher Conceptual Knowledge Utilization Outcomes in Table 3). Finally, parents completed behavior rating scales for their children (Cycle 1 only).

Phase 2—Training Session I: Basics Concepts (5 Hours). Experimental teachers (and teams) participated in one 5-hour training session conducted by the authors. Here, they received a procedural manual that included resource materials, record forms, training activities, and step-by-step procedures for implementing FA and PBS. During this session, the authors (a) provided an overview of the five-step experimental process (see Table 2), (b) reviewed characteristics of collaboration and allowed participants to practice and evaluate their own collaboration skills, and (c) provided an in-depth focus on Step #1 (Conduct Functional Assessment) that included an explanation and demonstration of procedures for conducting an FA based on the Functional Assessment and Intervention System (FAIS; Stoiber, 2004).

Phase 3—Training Session 2: Functional Assessment Plan and Goals (5 Hours). Teams (including teachers) participated in a second 5-hour training session (2 weeks following Training Session 1) that focused on Step #2 (Establish Goals and Benchmarks). Specifically, the authors

Table 2
Experimental FA and PBS Steps and Outcomes

FA and PBS Steps	Activities or Outcomes Indicated on Record Form
Step #1: Conduct Functional Assessment	1. Identify primary behavioral concern. 2. Describe the context for the behavior of concern. 3. Indicate conditions related to the behavior (slow/fast triggers). 4. Identify functions (pay-off) of the behavior. 5. Describe previous strategies and their effectiveness. 6. Identify student assets and school/home resources. 7. Identify alternative positive behavior to strengthen. 8. Write summary statement integrating assessment information.
Step #2: Establish Goals and Benchmarks	1. Establish a target date for goal attainment. 2. Describe what the child is expected to do. 3. Describe the context for performance of goal behavior. 4. Define benchmarks for goal behavior on a 7-point scale. 5. Collect baseline of goal behavior performance.
Step #3: Design PSP	1. Develop Preventative (Learning Environment) Strategies linked to the FA information. 2. Determine appropriate Teaching Competence (including Self-Control) Strategies. 3. Determine appropriate Altered Response Strategies. 4. Delineate team member roles and responsibilities. 5. Evaluate the intervention plan prior to implementation.
Step #4: Implement the PSP and Monitor Progress	1. Implement the PSP, as planned. 2. Collect goal-attainment scaling data to monitor progress. 3. Meet with consultant/authors to evaluate the PSP and progress. 4. Revise the PSP, as needed, and document revisions.
Step #5: Summarize and Evaluate Outcomes	1. Summarize progress and determine what components of the PSP facilitated progress and what was not effective. 2. Make consensus decisions about continuation of the PSP or revision of goal/benchmarks; record decisions. 3. Summarize and incorporate revisions in the PSP.

demonstrated the process of establishing goals and writing benchmarks to monitor children's progress toward goals. During this session, teams established one goal for the TARGET child and one goal for the GEN child. Teams also developed a plan for completing an FA for TARGET children. The assessment plan delineated roles to be assumed by each member of the team in conducting the assessment (e.g., classroom observation, review of records).

Phase 4—Pre-Intervention Classroom Observations (2 Weeks). Following Training Session 2, observations of children's behavior and teachers' classroom practices were conducted by trained observers over a 2-week, pre-intervention period (see Child Outcome Measures and Teacher Instrumental Knowledge Utilization Outcomes). Two observation sessions were completed for each child whose parent(s) provided consent and for each classroom in which teachers provided consent for in-class observations.

Phase 5—Completion of FA (2 Weeks). Each school-based team completed an FA for the TARGET child during this 2-week assessment phase (Phase 5). Specifically, team members collected

information concerning variables that trigger challenging behavior, identified the possible function of behavior, and prepared a summary statement integrating all assessment data (Step #1 of FAIS). Information obtained through the FA was noted on a record form. At the conclusion of this phase, teams met individually with the authors to review FA information and behavior goal statements and benchmarks for the TARGET children (Step #2 of FAIS).

Phase 6—Training Session 3: Development of PBS Plan (5 Hours). Once the FAs were completed for TARGET children, teams convened for a third training session that focused on Step #3 (Develop Positive Support Plan). Teachers received training on characteristics of effective intervention plans, which includes incorporating an integrated set of multiple strategies linked to the FA data, emphasizing preventive and positive approaches, and promoting children's development of positive classroom behaviors. Teams were provided with explicit guidelines for developing positive support plans (PSPs) that incorporated Preventative-Teaching-Alternative Response (PTA) types of intervention strategies: those designed to (a) buffer against or eliminate setting conditions or triggers that set off the problem behavior (*preventative strategies*), (b) develop competencies that serve as alternatives to the problem behavior (*teaching strategies*), and (c) alter responses or consequences that have been maintaining the problem behavior (*alternative response strategies).*

Phase 7—Implementation of PBS Plan (8–10 Weeks). Subsequent to the third training session, teams implemented the PSP over an 8- to 10-week intervention period for TARGET children. The authors met with teachers and their school-based teams midway through Phase 7 (after 4–5 weeks of implementation) to discuss procedural issues and review the progress of TARGET children. At this time, teams were also instructed to initiate and complete the five-step FA+PSP process for the GEN child without consultation and support from the authors. Similar to the procedures for TARGET children, PSPs were developed following completion of an FA, and intervention strategies were implemented in classrooms for GEN children for 4 to 5 weeks.

Phase 8—Post-Intervention Measurement (2 Weeks). During this phase, (a) teachers completed behavior ratings for TARGET and GEN children, as well as self-ratings of their knowledge and efficacy beliefs; (b) observers conducted observations of children's behavior and classroom practices; and (c) parents completed behavior ratings for children (Cycle 1 only).

Teachers in the control classrooms participated in the child selection, assessment, and observation phases described earlier (Phases 1, 4, and 8) during the same periods that measurement occurred in the experimental classrooms. Control teachers (and their respective school-based teams) did not participate in any training or implementation phases, nor did they receive manuals or resources related to FA and designing positive support interventions.

Dependent Measurement

Multiple measurement procedures were used to collect data for the purpose of evaluating the effects of professional development and FA and PBS procedures on both teacher outcomes (conceptual and instrumental knowledge) and child outcomes (ratings and observations of classroom behavior).

Teacher Conceptual Knowledge Utilization Outcomes

To examine the effects of training on beliefs and knowledge related to FA and PBS, experimental and control teachers completed self-ratings on two measures adapted from previous research that evaluated preservice training for graduate students in special education, school psychology, and early childhood education (Gettinger, Stoiber, & Koscik, 2008). Each scale is described in the following sections.

Competency Self-Ratings. The Competency Self-Ratings (CSR) is a 15-item, self-report measure developed to examine teachers' appraisal of their own competence. Teachers rated their level of competence on a 4-point continuum (1 = not at all competent; 4 = highly competent) regarding FA practices (e.g., "I know how to plan and implement information-gathering activities as part of a comprehensive functional assessment"), PBS intervention planning (e.g., "I can develop a positive behavior support plan that includes strategies to teach replacement behaviors"), and progress monitoring (e.g., "I know how to use progress-monitoring data to make appropriate changes in the intervention plan"). The CSR has adequate internal consistency, with $\alpha = .93$ for the current sample. Total scores (possible range = 15–60) were used in the analyses for this study; higher scores indicate higher ratings of competence.

Accommodating Children With Challenging Behavior. Accommodating Children with Challenging Behavior (ACCB) assesses perceived capabilities to understand challenging behavior (e.g., "I am able to determine what contributes to the occurrence of challenging behavior") and to work effectively with children who exhibit challenging behaviors (e.g., "I am confident that I have the ability to develop appropriate strategies to promote the learning of children with challenging behaviors"). Teachers rated the degree to which they agree with 20 statements using a 4-point rating scale (1 = strongly agree; 4 = strongly disagree). The ACCB has adequate internal consistency (Stoiber et al., 1998), with $\alpha = .91$ for the current sample. Total scores (possible range = 20-80) were used in the current analyses; lower scores indicate higher self-efficacy beliefs for accommodating problem behavior.

Teacher Instrumental Knowledge Utilization Outcomes

Two procedures were used to (a) examine the extent to which the classroom practices and behaviors of experimental and control teachers reflected knowledge of FA and PBS, and (b) determine the extent to which experimental teachers implemented the FA and PBS steps listed in Table 2 with integrity.

Observer Rating of Ecobehavioral Variables Scale. Teacher behaviors and classroom variables were observed in classrooms of experimental ($n = 25$) and control teachers ($n = 16$) who provided consent for classroom observations using a modification of the Observer Rating of Ecobehavioral Variables Scale (OREVS; see Chandler et al., 1999). The OREVS includes 29 teacher behaviors or classroom practices that have been shown to prevent challenging behavior and to support positive behavior in elementary school children. For purposes of this study, 20 behaviors that were specifically emphasized during the professional development training sessions were observed. The 20 behaviors or practices were grouped into one of three categories, known as PTA, based on the categorization scheme by Chandler et al. (1999) and Stoiber (2004): (a) Preventive Strategies comprise seven behaviors or practices that relate to the classroom environment, including classroom arrangement/organization; grouping/arrangement of children; use of signals; and arrangement or scheduling of tasks, materials, and activities (e.g., "Transitions were signaled by the teacher both visually and verbally"); (b) Teaching Competence Strategies include seven behaviors whereby the teacher is directing, explaining, or prompting children to engage in appropriate behavior, as well as providing opportunities for children to practice appropriate classroom behaviors; there is an element of explanation or coaching involved in these practices (beyond simply providing a cue or signal); also included in this category are items that relate directly to teaching or instructing children (e.g., "The teacher used unison responding during whole-group instruction"); and (c) Altered Response Strategies comprise six behaviors or practices that relate to responding to or consequating children's behavior, including praising, reinforcing, redirecting, ignoring, and correcting in response to, or

contingent on, the child's appropriate or inappropriate behavior; this also includes task or environmental modifications made in response to children's needs (e.g., "The teacher reinforced children [individually or to the group] when they were actively or passively engaged in expected tasks").

Consistent with the procedure implemented by Chandler et al. (1999), trained observers who were blinded to the study conducted two 30-minute observation sessions, 5 to 8 days apart, at pre-intervention and post-intervention. During each session, observers recorded an item as occurring if it was present for at least 50% of the observation session or for at least 50% of the children in the classroom. The proportion of practices within each category (Preventive, Teaching, and Altered Response) across the two observation sessions was determined.

Classroom observers were seven graduate students in school psychology, who participated in two 2-hour training sessions that included a careful review of observation procedures and protocols, as well as practice with classroom videotapes. For approximately 20% of all observation sessions, two independent observers simultaneously observed and recorded classroom variables. Average agreement across all categories was 97%, ranging from 92% (Altered Response Strategies) to 100% (Preventive Strategies).

Intervention Integrity. Implementation of FA and PBS procedures required the completion of a structured record form for each step listed in Table 2. Record forms for TARGET and GEN children were collected, evaluated, and coded for implementation integrity. Specifically, each step in Table 2 was broken down into 5 to 8 activities; activities were scored as 0 (not completed), 1 (completed with minimum specificity), or 2 (completed with sufficient specificity), based on an analysis of the record form. For example, for Step #1 (Conduct Functional Assessment), each activity listed in Table 2 (e.g., identify behavioral concern, describe context for behavior, identify positive alternative behavior, etc.) received a rating from 0 to 2; the integrity score for Step #1 had a possible range of 0 to 16. With a total of 25 activities associated with the procedural steps in Table 2, the integrity score for each child's intervention had a possible range of 0 to 50. All record forms were double-coded by two independent raters; agreement across raters for integrity scores was 85%. Disagreements were resolved by consensus among the two original raters and a third rater (the second author).

Student Outcome Measures

A multi-informant (teachers, parents), multi-method (ratings, observations) approach was used to evaluate student outcomes at pre- and post-intervention for the three groups of student participants (TARGET and GEN children in experimental classrooms; CONTROL children with challenging behaviors in control classrooms). Each measurement procedure is explained in the following sections.

Social Competence Performance Checklist. The Social Competence Performance Checklist (SCP) was completed by classroom teachers to provide frequency ratings of children's positive and challenging classroom behaviors. This checklist is included in the Functional Assessment and Intervention System (Stoiber, 2004); it was developed based on research and teacher judgments of classroom behaviors of children that contribute to classroom competence and success in school (e.g., Feil et al., 2000). The SCP consists of a Positive Behavior Scale and Challenging Behavior Scale. The Positive Behavior Scale (total possible score range = 0-75) includes 25 behaviors across four subscales: Self-Control (four behaviors, e.g., "Calms himself or herself when upset"), Social Cooperation (seven behaviors, e.g., "Participates appropriately in large groups"), Learning Behavior (six behaviors, e.g., "Follows teacher directions"), and Academic Skills (eight skills, e.g., "Writes first name"). There also are 25 behaviors on the Challenging Behavior Scale (total score range = 0-75) across four subscales: Aggression (eight behaviors, e.g., "Throws objects"), Distractibility

(six behaviors, e.g., "Looks or wanders around"), Noncompliance (five behaviors, e.g., "Refuses to do activities"), and Negative Affect (six behaviors, e.g., "Whines, cries, or complains").

On the SCP, teachers indicated how often each behavior had occurred over the last 2 weeks using a 4-point Likert scale, ranging from 0 (rarely) to 3 (mostly). Both total scale (Positive Behavior and Challenging Behavior) and subscale scores were used in the analyses of student outcomes. Reliability studies using the SCP indicate that the measure has good internal consistency reliability, with alpha coefficients ranging from .90 to .97 on the Positive Behavior Scale (α =.93 for the current sample) and corresponding subscales, and from .87 to .97 on the Challenging Behavior Scale (α =.97 for the current sample) and subscales (Stoiber, 2004).

Behavior Assessment System for Children. Teachers in the experimental classrooms completed the Behavior Assessment System for Children (BASC)-Teacher Rating Scales (Reynolds & Kamphaus, 1992) for TARGET and GEN children. In addition, BASC-Parent Rating Scales were obtained for children during the first cycle (14 TARGET and 8 GEN children). The BASC is a nationally standardized measure on which teachers and parents rate the frequency of behaviors over the previous 6 months using a 4-point scale, ranging from "never" to "almost always." The BASC is used frequently in research to assess behavioral and emotional functioning in children and has adequate psychometric properties (Reynolds & Kamphaus, 1992). Composite scores used in the current study included those closely related to the category of challenging behavior: Externalizing Problems (Aggression, Hyperactivity, and Conduct Problems; reported coefficient alphas = .81, .74, .71, respectively; computed Externalizing Composite Cronbach's alpha = .88); Behavior Symptoms Index (Attention, Atypicality, and Withdrawal; reported coefficient alphas = .81, .51, .78, respectively; computed Behavior Symptoms Composite Cronbach's alpha = .90); and Adaptive Skills (Adaptability and Social Skills; reported coefficient alphas = .74 and .89, respectively; computed Adaptive Skills Composite Cronbach's alpha = .89). Composite T scores, with a mean of 50 and an *SD* of 10, were used in the analyses for this study.

Classroom Competence Observation Form. Two observations of children's classroom behavior (separated by 5–8 days) occurred at pre-intervention (Phase 3) and post-intervention (Phase 8) using the Classroom Competence Observation Form (CCOF). Observations were conducted only for children whose parents provided consent to do so, which included 25 target children (71% of TARGET sample), 22 generalization children (91% of GEN sample), and 23 children in control classrooms (66% of CONTROL sample). The CCOF is included as an observation structure in the FAIS (Stoiber, 2004) and adapted to provide a format for directly observing and recording the occurrence of two categories of positive behavior and four categories of challenging behavior in children (parallel to behaviors rated by teachers using the SCP Checklist described earlier). The first category of positive classroom behavior, Social Cooperation, includes working or playing cooperatively with a peer or in a small group, participating appropriately in large-group activities, interacting positively with peers, and accepting feedback and redirection from others. The second category of positive behavior, Learning Behavior, includes following teacher directions, staying focused on tasks, being appropriately engaged in designated activities, and demonstrating understanding of concepts or learning tasks. The four categories of challenging behavior include: (a) Aggression (e.g., pushes, hits, kicks children; takes objects from peers; destroys property); (b) Distractibility (e.g., talks out of turn, looks or wanders around, fidgets); (c) Noncompliance (e.g., does not follow directions, refuses to do expected activity); and (d) Negative Affect (e.g., whines, cries, complains; blames others).

Teachers identified three contexts during which problem behaviors occurred most frequently for nominated children, including teacher-directed activities, transitions, and independent work/play periods. Observational data were collected during these activities for children by observers, who were

blinded to the study and trained by the first author. During each observation session in experimental classrooms, two children (TARGET, GEN) were observed in random order using the following time-sampling procedure: Trained observers watched a child for 30 seconds and then tallied the occurrence of positive behaviors (15-second recording interval). Next, observers watched the same child for 30 seconds and tallied the occurrence of challenging behaviors (15-second recording interval). This cycle was repeated for the second child. Observers completed a total of seven observation-recording cycles for TARGET and for GEN children during each observation session. Children with challenging behaviors in control classrooms were observed using a similar time-sampling procedure. The average number of occurrences of each behavior type across the two observation sessions was calculated at pre- and post-intervention.

Observations of children's behavior were conducted by the same trained observers and occurred on the same day as observations of teacher and classroom variables (described previously). For approximately 20% of all observation sessions, two observers simultaneously and independently observed and recorded children's behavior. Average agreement across all behavior categories was 92%, ranging from 88% (Social Cooperation) to 100% (Aggression).

Observation of Goal Behaviors

A second observation procedure was implemented in experimental classrooms only and involved the use of a time-sampling procedure to note the occurrence of goal behaviors identified during Phase 3. Specifically, observers tallied the occurrence of two behaviors: (a) TARGET child's goal, or Goal Behavior 1, and (b) GEN child's goal, or Goal Behavior 2. Observations occurred at pre-intervention (two observation sessions) and post-intervention (two observation sessions) for children in experimental classrooms in the following manner: observers watched a child for 15 seconds and then noted the occurrence or nonoccurrence of Goal Behavior 1 (5-second recording interval). Specifically, observers noted whether children were performing the actual goal behavior (e.g., keeping hands to self during circle time) or behaving in a manner consistent with the goal (e.g., working on assigned task when the goal is task completion). This cycle was repeated for the second child. Observers completed a total of nine observation-recording cycles for all experimental children (TARGET and GEN) for Goal Behavior 1. Observers then noted the occurrence of Goal Behavior 2 using the same procedure. This allowed for analysis of change in both a targeted and nontargeted goal behavior for children. The rate of occurrence (proportion) for goal behaviors was calculated for pre- and post-intervention. Agreement between raters on the occurrence of goal behavior averaged 94% across all sessions.

Evaluation Design

The study used a randomized, experimental-control group design that incorporated between-group and within-group comparisons to evaluate the effects of the experimental program on teachers and children. The design allowed us to test four predictions. First, at post-intervention, we predicted that compared with control teachers, experimental teachers would have higher (a) self-reported competencies in conducting FAs and designing PBS plans linked to assessment information, and (b) self-efficacy beliefs related to accommodating children with challenging behaviors. A multivariate analysis of covariance (MANCOVA), covarying for pre-intervention scores, was conducted to examine post-intervention differences between experimental and control teacher scores.

Second, at post-intervention, we predicted that observations of classrooms of experimental teachers would reveal a higher rate of preventative, teaching, and altered response variables associated with FA and PBS, compared with control classrooms. A MANCOVA, covarying for pre-intervention

observations, was used to compare post-intervention occurrence of teacher and classroom variables between experimental and control classrooms.

Third, we expected that implementation of evidence-based FA and PBS procedures for TARGET and GEN children would produce significantly lower ratings of challenging behaviors and higher ratings of positive behaviors at post-intervention, compared with children with challenging behavior in control classrooms (CONTROL). To examine these between-group child outcomes, a MANCOVA covarying for pre-intervention scores was conducted on post-intervention ratings. Similarly, we predicted lower frequencies of observed challenging behaviors and higher frequencies of observed positive behaviors for children in the experimental classrooms at post-intervention; this prediction was also tested using a MANCOVA procedure.

Finally, we predicted that a significant level of behavioral change would be evidenced in the TARGET and GEN students; CONTROL students were not expected to demonstrate significant behavioral change. To test this prediction, reliability change indices (RCIs) were calculated to examine the degree of behavioral change among TARGET, GEN, and CONTROL groups between pre- and post-intervention on behavior ratings (i.e., within-group change). The RCI is interpreted similar to a z score and is appropriate for measuring change using within-group and single-participant designs (Nunnally & Kotsche, 1983). An RCI greater than 1.96 indicates a statistically significant change at the $p < .05$ level. To calculate an RCI, differences between pre- and post-intervention scores were computed and divided by the standard error of measurement (SEM) of the instrument. The SEM for the SCP Positive Behavior Checklist is 3.28. The SEM for the SCP Challenging Behavior Checklist is 3.21.

Results

Conceptual Knowledge Differences Between Experimental and Control Teachers (Prediction 1)

Table 3 presents the means and *SD*s for experimental and control teachers at pre- and post-intervention on two conceptual knowledge measures: (a) self-ratings of competence related to FA and PBS (CSR), and (b) beliefs about accommodating children with challenging behavior (ACCB). As predicted, there was a significant multivariate main effect for group after controlling for pre-intervention scores, $F(3, 68) = 47.64$, $\eta^2 = .69$. Follow-up univariate tests, reported in Table 3, revealed significant between-group differences for both the CSR and ACCB, with higher self-ratings of competence and higher self-efficacy beliefs among experimental teachers.

Instrumental Knowledge Differences Between Experimental and Control Teachers (Prediction 2)

Table 3 also reports the observed rates of occurrence of three types of classroom variables at pre- and post-intervention in classrooms of experimental versus control teachers. There was a significant multivariate effect for group, $F(3, 34) = 25.74$, $\eta^2 = .67$. Follow-up univariate tests revealed significant between-group differences for each observed classroom variable ($p < .000$) in favor of the experimental classrooms: *Preventive Strategies*, $F(1, 36) = 32.66$; *Teaching Strategies*, $F(1, 36) = 60.67$; and *Altered Response Strategies*, $F(1, 36) = 23.68$.

A second index of instrumental knowledge utilization among experimental teachers was based on the intervention integrity scores. The extent to which teachers accurately implemented FA and PBS procedures was determined based on an evaluation and coding of the intervention record forms for individual children. Overall, the implementation integrity scores were moderately high for both TARGET and GEN children. The integrity scores, however, were significantly higher for TARGET children ($mn = 38.23$, or 76% of total points; $SD = 5.99$) compared with GEN children ($mn = 30.00$,

Table 3
Experimental and Control Teachers' Performance on Conceptual and Instrumental Knowledge Measures at Pre-Intervention and Post-Intervention

	Experimental Teachers ($n = 35$)		Control Teachers ($n = 35$)		
Measure	Pre	Post	Pre	Post	F value
CSR	39.12	52.20	34.68	32.40	133.18
	(9.04)	(5.55)	(5.29)	(6.50)	($p < .001$)
ACCB[a]	46.41	40.49	45.01	43.00	6.52
	(4.96)	(4.55)	(3.44)	(5.04)	($p < .01$)
OREVS	0.72	0.88	0.71	0.76	32.66
Preventive Variables[b]	(0.17)	(0.11)	(0.22)	(0.17)	($p < .001$)
OREVS	0.69	0.91	0.72	0.77	23.68
Response Variables[b]	(0.26)	(0.14)	(0.20)	(0.18)	($p < .001$)
OREVS	0.69	0.94	0.70	0.71	60.67
Teaching Variables[b]	(0.18)	(0.11)	(0.18)	(0.20)	($p < .001$)

[a]Lower score indicates less difficulty in accommodating problem behavior.
[b]Values indicate the proportion of time during which facilitative classroom variables occurred.

or 60% of total points; $SD = 8.27$), $t(45) = 2.88$, $p < .05$. It is important to remember that FA and PBS procedures were implemented for TARGET children with explicit training, consultation, and feedback from the authors; implementation for GEN children occurred independently by teachers and teams.

Effects of FA and Positive Support on Child Outcomes (Predictions 3 and 4)

Tables 4, 5, and 6 present the means and *SD*s on all child outcome measures (ratings and observations) for TARGET, GEN, and CONTROL children. First, Table 4 displays the SCP Checklist teacher ratings for children at pre-intervention and post-intervention. As predicted, a MANCOVA revealed a significant multivariate effect for group ($p < .01$) after controlling for differences at pre-intervention, $F(4, 168) = 3.59$, $\eta^2 = .21$. Follow-up univariate and post hoc tests revealed significant differences ($p < .001$) between TARGET and CONTROL children on the SCP Positive Behavior Scale, $F(1, 63) = 20.02$, $\eta^2 = .24$, and three positive behavior subscales: (a) Self-Control, $F(1, 63) = 26.36$, $\eta^2 = .30$; (b) Social Cooperation, $F(1, 63) = 22.05$, $\eta^2 = .26$; and, (c) Learning Behavior, $F(1, 63) = 22.12$, $\eta^2 = .26$. In addition, follow-up tests showed significant between-group differences on the SCP Challenging Behavior Scale, $F(1, 63) = 6.49$, $p < 0.01$, $\eta^2 = .11$, and for three negative behavior subscales: (a) Aggression, $F(1, 63) = 10.33$, $\eta^2 = .14$; (b) Noncompliance, $F(1, 63) = 10.62$, $\eta^2 = .14$; and (c) Negative Affect, $F(1, 63) = 12.53$, $\eta^2 = .17$. In all comparisons, TARGET children were rated by classroom teachers as displaying a higher frequency of positive behaviors and lower frequency of challenging behaviors compared with CONTROL children.

A similar trend in results occurred for post-intervention comparisons between GEN and CONTROL children (see Table 4). Specifically, the GEN students showed higher rates of positive behaviors compared with the CONTROL students at post-intervention on the Positive Behavior Scale, $F(1, 54) = 3.94$, $\eta^2 = .07$, and on three positive subscales: (a) Self-Control, $F(1, 54) = 5.96$, $\eta^2 = .10$; (b) Social Cooperation, $F(1, 54) = 15.70$, $\eta^2 = .23$; and, Learning Behavior, $F(1, 54) = 7.09$, $\eta^2 = .12$. The GEN group also demonstrated significantly lower ratings of negative behavior on the Challenging Behavior Scale, $F(1, 54) = 3.92$, $\eta^2 = .07$, and on the Aggression subscale

Table 4
Experimental and Control Teacher Ratings on the SCP Checklist

	TARGET ($n = 33$)		GEN ($n = 24$)		CONTROL ($n = 33$)	
SCP Scales and Subscales	Pre	Post	Pre	Post	Pre	Post
Positive Behavior[a,b]	44.46 (12.67)	58.30 (9.52)	48.50 (10.38)	54.96 (9.34)	36.58 (15.24)	39.67 (18.38)
Pre-Post RCI		*4.22***		*1.97**		*0.84*
Self-Control[a,b]	5.52 (2.90)	8.74 (2.13)	7.62 (8.38)	8.38 (2.63)	5.33 (3.67)	5.18 (3.77)
Cooperation[a,b]	11.88 (4.12)	15.55 (3.27)	11.59 (2.94)	13.45 (3.61)	10.63 (5.44)	10.17 (5.62)
Learning[a,b]	10.03 (3.07)	13.90 (2.21)	10.82 (12.86)	12.86 (1.96)	10.00 (4.47)	10.15 (4.72)
Academic[a,b]	17.77 (6.74)	20.34 (4.71)	17.43 (6.24)	19.87 (4.47)	12.25 (8.70)	16.63 (8.44)
Challenging Behavior[a,b]	48.18 (12.91)	32.73 (13.17)	37.21 (14.22)	30.13 (15.94)	34.76 (19.49)	36.21 (17.55)
Pre-Post RCI		*−4.81***		*−2.21**		*0.45*
Aggression[a,b]	12.65 (6.90)	8.03 (5.55)	7.75 (5.56)	6.79 (4.96)	9.61 (7.35)	10.58 (6.44)
Distractibility	14.46 (3.83)	11.61 (4.55)	13.25 (4.47)	9.83 (5.43)	9.30 (5.66)	9.00 (5.56)
Noncompliance[a]	9.61 (3.01)	5.42 (2.84)	6.96 (3.11)	5.54 (3.28)	7.75 (4.46)	7.44 (3.62)
Negative Affect[a]	11.06 (5.16)	7.52 (4.36)	9.25 (6.80)	7.96 (5.81)	7.74 (5.34)	9.32 (5.72)

[a]TARGET < CONTROL.
[b]GEN < CONTROL.
* $p < .05$. ** $p < .01$.

$F(1, 54) = 4.61$, $\eta^2 = .08$. No univariate or post hoc group differences were found on the Academic Skills or Distractibility subscales. In addition, there were no differences between TARGET and GEN children on any positive or challenging behavior subscales/scales.

To examine the degree of change from pre-intervention to post-intervention on the SCP composite scales, reliable change indices (RCIs) were calculated for the two experimental subgroups (TARGET and GEN) and for CONTROL students. Because 95% of the scores fall within 1.96 *SD*s from the mean, given a normal distribution, an RCI > 1.96 is considered a statistically significant change, or a change not likely observed as the result of measurement error ($p < .05$); an RCI > 2.33 corresponds to $p < .01$. As predicted, the RCIs calculated for TARGET students indicated significant, reliable gain on the Positive Behavior Scale and reduction on Challenging Behavior Scale composite scores ($p < .01$). The GEN group also evidenced significant change ($p < .05$) on the Positive and Challenging Behavior Scales (see Table 4). As expected, the RCIs for children in control classrooms were not significant (RCIs < 1.96).

Table 5 presents the Teacher and Parent (Cycle 1 only) BASC ratings for TARGET and GEN children at pre- and post-intervention on the Externalizing Behaviors, Behavioral Symptoms, and Adaptive Skills composite scales. Using the teacher ratings, RCIs calculated for TARGET children indicated significant improvement on all three composites; the GEN group showed significant improvement only on the Adaptive Skills composite. Using the parent ratings, both subgroups of children in the experimental classrooms demonstrated significant improvement on all three BASC composites.

Finally, Table 6 summarizes the occurrence of challenging and positive behaviors among child participants in the experimental (TARGET and GEN) and control (CONTROL) classrooms at pre- and post-intervention. A MANCOVA, covarying for pre-intervention behavior, was used to compare post-intervention behaviors among the three groups of children with challenging behaviors. As predicted, there was a significant multivariate effect for group, $F(12, 112) = 9.20$, $p = .000$, $\eta^2 = .74$. Follow-up univariate tests revealed significant between-group differences for each observed

Table 5
Teacher and Parent BASC Ratings for Experimental Children at Pre-Intervention and Post-Intervention

	TARGET			GEN		
BASC Scales	Pre	Post	RCI	Pre	Post	RCI
Teacher – Externalizing Problems[a]	64.49 (10.25)	57.14 (8.29)	−2.82*	56.29 (7.97)	54.21 (7.71)	0.80
Teacher – Behavioral Symptoms[a]	65.40 (11.88)	57.84 (9.83)	−4.45*	60.04 (9.76)	58.08 (11.14)	−1.15
Teacher – Adaptive Skills[a]	38.86 (7.07)	45.91 (7.86)	3.52*	43.00 (8.42)	47.96 (7.49)	2.48*
Parent – Externalizing Problems[b]	60.35 (10.95)	51.88 (12.23)	−2.38*	54.20 (17.43)	50.75 (12.21)	−2.97*
Parent – Behavioral Symptoms[b]	53.65 (6.60)	46.59 (9.04)	−2.42*	53.14 (3.67)	48.00 (10.58)	−4.00*
Parent – Adaptive Skills[b]	40.57 (11.18)	47.53 (13.06)	2.50*	43.71 (10.37)	48.38 (11.89)	2.92*

[a]TARGET, $n = 33$; GEN, $n = 24$ (Cycle 1 and Cycle 2 cohorts).
[b]TARGET, $n = 14$; GEN, $n = 8$ (Cycle 1 cohort only).
*$p < .01$.

behavior ($p < .001$): Social Cooperation, $F(2, 61) = 11.48$; Learning Behavior, $F(2, 61) = 29.76$; Aggression, $F(2, 61) = 19.33$; Distractibility, $F(2, 61) = 34.39$; Noncompliance, $F(2, 61) = 18.13$; and Negative Affect, $F(2, 61) = 7.29$. Post-hoc comparisons of frequencies for each behavior category revealed that both subgroups of experimental children (TARGET and GEN) displayed more social cooperation and engagement behaviors and lower aggression and noncompliance ($p < .01$) compared with CONTROL children at post-intervention. In addition, there was a significant difference between TARGET and CONTROL children for occurrence of distractibility and negative affect behaviors at post-intervention ($p < .01$), with TARGET children demonstrating fewer problem behaviors.

Table 6 also presents the average rate of occurrence for goal behaviors among TARGET and GEN children in the experimental classrooms. Goal Behavior 1 was targeted for intervention for TARGET children, and Goal Behavior 2 was targeted for GEN children. Rates of occurrence for goal

Table 6
Occurrence of Behaviors for Experimental and Control Children at Pre-Intervention and Post-Intervention

	TARGET ($n = 33$)		GEN ($n = 24$)		CONTROL ($n = 33$)	
Behaviors	Pre	Post	Pre	Post	Pre	Post
CCOF: Cooperation[a,b]	3.34 (1.96)	8.16 (3.54)	3.28 (1.78)	6.75 (4.01)	3.27 (2.67)	3.61 (2.22)
CCOF: Learning[a,b]	10.21 (4.81)	18.11 (3.89)	10.75 (3.77)	16.43 (3.48)	10.22 (3.50)	12.00 (4.44)
CCOF: Aggression[a,b]	2.30 (1.82)	0.65 (0.94)	1.96 (1.70)	1.42 (0.94)	2.22 (1.73)	2.64 (3.20)
CCOF: Distractibility[a]	9.39 (4.62)	4.19 (2.40)	7.15 (3.35)	4.68 (2.78)	7.78 (3.88)	6.27 (3.82)
CCOF: Noncompliance[a,b]	2.46 (1.18)	0.78 (0.26)	2.23 (1.37)	1.24 (0.97)	2.01 (1.78)	2.67 (2.08)
CCOF: Negative Affect[a]	2.23 (1.92)	0.80 (0.47)	2.04 (1.81)	1.57 (0.99)	1.94 (1.83)	2.00 (1.85)
Goal Behavior 1	.44 (.21)	.91 (.18)	.78 (.12)	.81 (.21)		
Pre to Post (d)[c]		*1.90*		*0.27*		
Goal Behavior 2	*.75(.26)*	.79 (.19)	.34 (.11)	.77 (.12)		
Pre to Post(d)[c]		*0.19*		*2.07*		

[a]TARGET > CONTROL.
[b]GEN > CONTROL.
[c]Effect size (d) = difference in means for pre- and post-intervention/*SD* of difference scores.

behaviors were compared using two repeated-measures 2 (Group) x 2 (Time) analysis of variance procedures for Goal Behaviors 1 and 2, with group (TARGET versus GEN) as the between-group variable and measurement time (pre- versus post-) as the within-group variable for each analysis. There was a significant main effect for time for both Goal Behavior 1, $F(2, 26) = 45.38$, $p < .001$, and Goal Behavior 2, $F(1, 20) = 42.52$, $p < .001$. There also was a significant Group x Time interaction for both behaviors (see Table 6). As expected, TARGET children evidenced significant improvement in their goal behavior over time, whereas GEN children did not differ in the occurrence of Goal Behavior 1 (which was a nontargeted behavior). Similarly, GEN children improved significantly in their goal behavior from pre- to post-intervention, whereas TARGET children showed no change in Goal Behavior 2 (nontargeted behavior).

Discussion

This study investigated teacher and child outcomes stemming from professional training and the implementation of FA and PBS plans with targeted children in prekindergarten, kindergarten, and first-grade classrooms. The results indicate that teachers who received professional development in FA and PBS practices demonstrated higher conceptual and instrumental knowledge utilization compared with a randomly designated group of control teachers. In addition, student outcomes based on multi-method, multi-source data provided support for the use of FA and PBS interventions as EBP for improving the social competent behavior of young children with challenging behavior. Specifically, children in experimental classrooms demonstrated significant within-group gains (RCI > 1.96) in the occurrence of positive behaviors (based on SCP and BASC ratings), as well as significant reductions in behavioral challenges from pre- to post-intervention. Furthermore, compared with children in control classrooms whose teachers did not implement FA and PBS, experimental children demonstrated more positive behaviors (ratings and observations) and fewer challenging behaviors at post-intervention, controlling for pre-intervention performance.

An important finding of the current study is that teachers' knowledge and application of FA and PBS procedures generalized to other children with challenging behaviors in their classrooms. Specifically, intervention effects were obtained for two groups of experimental students: (a) a group of students with targeted behavioral concerns (TARGET group) for whom the authors provided explicit support to implement FA and design individualized PBS intervention plans, and (b) a second group of students (GEN) for whom the FA was conducted and interventions developed and implemented without consultation and support from the authors. Both TARGET and GEN students showed improved competencies and reduced behavioral challenges at post-intervention, although the magnitude of improvement was generally greater for TARGET children. It should be noted that, by design, the FA and PBS procedures were implemented for GEN children for only 4 to 5 weeks compared with 8 to 10 weeks for TARGET children. The shorter intervention period could account for a lower magnitude of change among GEN children. Further evidence that teachers were able to generalize their knowledge and skills to other children was found in the significant improvement in goal behaviors for both TARGET and GEN children from pre- to post-intervention.

The findings of this study also are important in that professional development produced significant changes in teachers' ratings of their (a) competence in the area of FA and intervention planning, and (b) capacity to accommodate children with behavioral challenges. Furthermore, the experimental teachers demonstrated greater application of FA and PBS practices in their classrooms than did control teachers who did not participate in training sessions. Several features of the professional-development model were designed specifically to maximize the extent to which teachers implemented FA and PBS with accuracy and consistency, thus contributing to these positive teacher outcomes, suggesting increases in their resilience when faced with classroom difficulties. First, training and consultation were provided by individuals with experience in implementing FA

and helping teachers develop functionally linked interventions for children who exhibit challenging behaviors. Second, ongoing support and training were provided to teachers over a period of 4 months, during which they focused on one target child (TARGET). The ongoing professional development allowed sufficient time for teachers to implement procedures and receive feedback and guidance from the consultants. Third, the information presented during the training sessions focused on natural classroom settings.

We presented explicit intervention strategies for each component of a PSP, as well as general strategies to prevent challenging behavior and support positive behavior. Teachers learned to identify triggers and the function of appropriate and challenging behaviors, and to develop and implement interventions based on FA data. Another key to success was the focus on simple changes in classroom environments to reduce the frequency of challenging behavior, such as providing children with choices, creating well-organized learning centers, limiting the number of children in potentially crowded spaces, and providing children with leadership opportunities or responsibility in the classroom. The high implementation integrity scores for GEN children (60% of prescribed activities), although lower than the integrity scores for TARGET children, suggest that the professional development was beneficial in promoting generalization of FA and PBS knowledge and procedures to other children with challenges.

Finally, these results provide promising evidence that in-service educators are able to develop *instrumental* knowledge utilization in key areas that correspond to current educational reform initiatives, such as implementation of FA and data-based decision making. Moreover, the results demonstrate that teacher training and professional development in practices aligned with EBP can lead to improved levels of knowledge utilization, which in turn can improve student social competence and resilience outcomes.

Limitations and Future Research

A key feature of this study was the examination of both teacher and student outcomes using between-group and within-group comparisons. Despite the positive results from this study, there were limitations, and more work needs to be done. First, the professional development training included both didactic instruction and guided implementation practice with feedback. In addition, experimental teachers functioned as members of their school-based teams that participated collaboratively in the training and FA and PBS implementation. It is not known whether and/or how each of these components contributed to experimental participants' self-reported levels of competence and self-efficacy. It would also be useful to determine which components actually lead to gains in teachers' knowledge and, ultimately, improvements in their resilience and classroom practices.

Additional limitations of this study stemmed from the practical challenges associated with conducting experimental research within school-based settings. First, although districts were randomly assigned to participate in experimental versus control procedures, a more rigorous design would require random assignment of classrooms within districts to experimental or control conditions. School administrators, however, did not agree to this latter type of evaluation design. Second, some parents chose not to provide consent for their children to participate in one or more components of the study, thus potentially limiting the generalizability of findings. For example, of the children nominated for participation, only 86% received parental consent, and of those, less than 78% of parents agreed to have their child observed in the classroom. Similarly, teachers, overall, were disinclined to give their consent for classroom observations; fewer than 60% of participating teachers agreed to have observations conducted of their teaching and classroom practices.

One notable exception to the significant improvement among experimental children was in the area of academic skills. Neither TARGET nor GEN children received higher ratings of academic skills compared with CONTROL children at post-intervention (based on teacher SCP ratings). This

is reasonable and somewhat expected in that the focus of the PBS interventions was on classroom behaviors (e.g., talking out, staying in seat, disrupting others), not academic skill acquisition. Previous research has pointed out difficulties in demonstrating statistical significance in improving students' academic performance when they exhibit behavioral challenges (Harrison, Thompson, & Vannest, 2009). Further, Harrison et al. (2009) noted that there may be clinically significant changes due to an intervention, but these are not reflected in statistical significance indicators. Interestingly, there also were no significant differences between experimental- and control-group children at post-intervention on measures of distractibility (ratings or observations). This may reflect that distractibility is more highly associated with academic skills or may be less responsive to classroom-based behavioral interventions compared with externalizing behaviors. Other researchers have reported significant effects for interventions that directly target attention and academic performance, such as self-monitoring of attention and self-monitoring of academic performance (Harris, Friedlander, Saddler, Frizzelle, & Graham, 2005). These results are useful for school psychologists and suggest the need for future studies examining which aspects of a classroom behavioral intervention are necessary to alter attention and academic performance. For example, perhaps self-monitoring is a key intervention strategy that should be incorporated into interventions aimed at improving student attention and/or academic performance or, alternately, perhaps classroom interventions combined with psychotherapeutic medications are needed to maximize effects on attention when the child has attention deficit hyperactivity disorder or a biologically based behavioral concern.

Conclusion

Behavioral challenges remain a major concern in the schools. Most children with behavior problems begin to display challenging behaviors during the preschool or kindergarten years. Thus, teachers of young children require both conceptual and instrumental knowledge of strategies to develop instructional coping strategies to prevent behavior problems from escalating or to minimize existing challenging behaviors in their students. Prior research has shown that FA linked to PBS is a viable approach for responding to the needs of students with challenging behavior. Yet, very few studies have attempted to translate research-based findings and use such results to design and provide professional development for teachers aimed at improving children's resilience and social competence (Stoiber, 2011). The present study provided empirical support that FA and PBS improve classroom environments, decrease challenging behaviors, and strengthen positive behaviors. The between-group and within-group design elements expanded previous findings derived primarily from single-participant or nonexperimental studies (e.g., no control group). Furthermore, implementation of the experimental procedures occurred entirely within natural classroom settings by general education teachers. Thus, the positive results in the children's functioning reflect more than their behavioral change, with such facilitation of change fitting the role of school psychologists. These results also provide support for educators' capacity to function more resiliently by learning and implementing FA and PBS practices. Finally, the favorable outcomes for the group of generalization students suggest that EBP can be successfully implemented by teachers without extensive professional resources. That is, once teachers develop more resilient capacities, they are more able to promote social competence and resilience in students with challenging behaviors.

In sum, our study supports FA as a structure for the development of PSPs by school psychologists that extends beyond the reduction of behavioral challenges to the enhancement of children's learning environments and promotion of classroom competence. This study adds to the literature by illustrating that FA and PBS represent a promising EBP for helping children with challenging behavior who have not been identified as having a disability in general education classrooms. Through systematic and early implementation of such evidence-based approaches, an increase in the intensity of challenging behaviors can be prevented, thus avoiding long-term negative outcomes for high-risk children.

References

Alter, P. J., Conroy, M. A., Mancil, G. R., & Haydon, T. (2008). A comparison of functional behavior assessment methodologies with young children: Descriptive methods and functional analysis. Journal of Behavioral Education, 17, 200–219.

Bear, G. G. (2009). The positive in positive models of discipline. In R. Gilman, E. S. Huebner, & M. Furlong (Eds.), Handbook of positive psychology (pp. 305–321). New York: Routledge/Taylor & Francis.

Bushaw, W. J., & Gallup, A. M. (2008). The 40th annual Phi Delta Kappa/Gallup Poll of the public's attitudes toward the public schools. Phi Delta Kappan, 90, 9–20.

Chandler, L. K., & Dalhquist, C. M. (2002). Functional assessment: Strategies to prevent and remediate challenging behavior in school setting. Upper Saddle River, NJ: Pearson Education.

Chandler, L. K., Dahlquist, C. M., Repp, A. C., & Feltz, C. (1999). The effects of team-based FA on the behavior of students in classroom settings. Exceptional Children, 66, 101–122.

Dishion, T. J., & Patterson, G. R. (1999). Model-building in developmental psychopathology: A pragmatic approach to understanding and intervention. Journal of Clinical Child Psychology, 28, 502–512.

Dunlap, G., Strain, P. S., Fox, L., Carta, J. J., Conroy, M., Smith, B. J., et al. (2006). Prevention and intervention with young children's challenging behavior: Perspectives regarding current knowledge. Behavioral Disorders, 32, 29–45.

Ellingson, S. A., Miltenberger, R. G., Stricker, J., Galensky, T. L., & Garlinghouse, M. (2000). Functional assessment and intervention for challenging behaviors in the classroom by general classroom teachers. Journal of Positive Behavior Interventions, 2, 86–97.

Ervin, R. A., Radford, P. M., Bertsch, K., Piper, A. L., Ehrhardt, K. E., & Poling, A. (2001). A descriptive analysis and critique of the empirical literature on school-based FA. School Psychology Review, 30, 193–211.

Estabrooks, C. A. (1999). The conceptual structure of research utilization. Research in Nursing & Health, 22, 203–216.

Feil, E. G., Walker, H., Severson, H., & Ball, A. (2000). Proactive screening for emotional/behavioral concerns in Head Start preschools: Promising practices and challenges in applied research. Behavioral Disorders, 36, 13–25.

Fergusson, D. M., Horwood, L. D., & Ridder, E. M. (2005). Show me the child at seven: The consequences of conduct problems in childhood for psychosocial functioning in adulthood. Journal of Child Psychology and Psychiatry and Allied Disciplines, 46, 837–849.

Garet, M. S., Porter, A. C., Desimore, L., Birman, B. R., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. American Educational Research Journal, 38, 915–945.

Gettinger, M., Stoiber, K. C., Goetz, D., & Caspe, E. (1999). Competencies and training needs for early childhood inclusion specialists. Teacher Education and Special Education, 22, 41–54.

Gettinger, M., & Stoiber, K. C., & Koscik, R. (2008). Effects of a preparation program focused on accommodating children with challenging behaviors. Teacher Education and Special Education, 31, 164–181.

Gonzalez, L., Brown, M. S., & Slate, J. R. (2008). Teachers who left the teaching profession: A qualitative understanding. The Qualitative Report, 13, 1–11.

Greenberg, M. T., Kusche, C. A., & Riggs, N. (2004). The PATHS curriculum: Theory and research on neurocognitive development and school success. In J. E. Zins, R. P. Weissberg, M. C. Wang, & H. J. Walberg (Eds.), Building academic success on social and emotional learning: What does the research say? (pp. 170–188). New York: Teachers College Press.

Gresham, F. M. (2002). Best practices in social skills training. In A. Thomas & J. Grimes (Eds.), Best practices in school psychology IV (pp. 1029–1040). Bethesda, MD: National Association of School Psychologists.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. Child Development, 72, 625–638.

Harris, K. R., Friedlander, B. D., Saddler, B., Frizzelle, R., & Graham, S. (2005). Self-monitoring of attention versus self-monitoring of academic performance: Effects among students with ADHD in the general education classroom. Journal of Special Education, 39, 145–157.

Harrison, J., Thompson, B., & Vannest, K. J. (2009). Interpreting the evidence for effective interventions to increase the academic performance of students with ADHD: Relevance of the statistical significance controversy. Review of Educational Research, 79, 740–775.

Hood, P. (2002). Perspectives on knowledge utilization in education. San Francisco: WestEd.

Horner, R. H. (1994). Functional assessment: Contributions and future directions. Journal of Applied Behavior Analysis, 27, 401–404.

Hundert, J. P. (2007). Training classroom and resource preschool teachers to develop inclusive class interventions for children with disabilities: Generalization to new intervention targets. Journal of Positive Behavior Interventions, 9, 159–173.

Ingram, K., Lewis-Palmer, T., & Sugai, G. (2005). Function-based intervention planning: Comparing the effectiveness of FBA function-based and non-function-based intervention plans. Journal of Positive Behavior Interventions, 7, 224–236.

Kratochwill, T. R., & Shernoff, E. S. (2004). Evidence-based practice: Promoting evidence-based interventions in school psychology. School Psychology Review, 33, 34–48.

Luthar, S. (2000). The construct of resilience: A critical evaluation and guidelines for future work. Child Development, 71, 543–562.

Marquis, J. G., Horner, R. H., Carr, E. G., Turnbull, A. P., Thompson, M., & Behrens, G. A. (2000). A meta-analysis of positive behavior support. In R. Gersten, E. P. Schiller, & S. Vaughn (Eds.), Contemporary special education research: Synthesis of the knowledge base on critical instructional issues (pp. 86–105). Thousand Oaks, CA: Sage.

Merrell, K. (2008). Behavioral, social, and emotional assessment of children and adolescents (3rd ed.). New York: Erlbaum/Taylor & Francis.

Merrell, K. W., Levitt, V. H., & Gueldner, B. A. (2010). Proactive strategies for promoting social competence and resilience. In G. Peacock, R. Ervin, E. Daly, & K. Merrell (Eds.), Practical handbook of school psychology: Effective practices for the 21st century (pp. 254–273). New York: Guilford.

Myers, C. L., & Holland, K. L. (2000). Classroom behavioral interventions: Do teachers consider the function of the behavior? Psychology in the Schools, 37, 271–280.

Nelson, J. R., Roberts, M. L., Rutherford, R. B., Mathur, S. R., & Aaroe, L. A. (1999). A statewide survey of special education administrators and school psychologists regarding functional behavior assessment. Education and Treatment of Children, 22, 267–279.

Newman, S., & Vash, C. (1994). Gray matter: Utilization of rehabilitation research results. Rehabilitation Education, 8, 380–385.

Nunnally, J. C., & Kotsch, W. E. (1983). Studies of individual subjects: Logic and methods of analysis. British Journal of Clinical Psychology, 22, 83–93.

O'Neill, R. E., Horner, R. H., Albin, R. W., Sprague, J. R., Storey, K., & Newton, J. S. (1997). Functional assessment and program development for problem behavior: A practical handbook (2nd ed.). Pacific Grove, CA: Brooks/Cole.

Reynolds, C. R., & Kamphaus, R. W. (1992). Behavior Assessment System for Children: manual. Circle Pines, MN: American Guidance Service.

Rosenfield, S. (2002). Best practices in instructional consultation. In A. Thomas & J. Grimes (Eds.), Best practices in school psychology IV (pp. 609–624). Bethesda, MD: National Association of School Psychologists.

Safran, S. P., & Oswald, K. (2003). Positive behavior supports: Can schools reshape disciplinary practices? Exceptional Children, 69, 361–373.

Sasso, G. M., Conroy, M. A., Strichter, J. P., & Fox, J. J. (2001). Slowing down the bandwagon: The misapplication of FA for students with emotional or behavioral disorders. Behavioral Disorders, 26, 282–296.

Scott, T. M., DeSimone, C., Fowler, W., & Webb, E. (2000). Using FA to develop interventions for challenging behaviors in the classroom: Three case studies. Preventing School Failure, 44, 51–57.

Scott, T. M., & Kamps, D. M. (2007). The future of functional behavioral assessment in school settings. Behavioral Disorders, 32, 146–157.

Stage, S. A., Jackson, H. G., Moscovitz, K., Erickson, M. J., Thurman, S. O., Jessee, W., et al. (2006). Using multimethod-multisource functional behavioral assessment for students with behavioral disabilities. School Psychology Review, 35, 451–471.

Stoiber, K. C. (2004). Functional assessment and intervention system. San Antonio, TX: Pearson.

Stoiber, K. C. (2011) Translating knowledge of social-emotional learning and evidence-based practice into responsive school innovations. Journal of Educational and Psychological Consultation, 21, 46–55.

Stoiber, K. C., & DeSmet, J. (2010). Guidelines for evidence-based practice in selecting interventions. In R. Ervin, G. Peacock, E. Daly, & K. Merrell (Eds.), Practical handbook of school psychology (pp. 213–234), New York: Guilford.

Stoiber, K. C., Gettinger, M., & Fitts, M. (2007). Functional assessment and positive support strategies: Case illustration of process and outcomes. Early Childhood Services, 1, 165–179.

Stoiber, K. C., Gettinger, M., & Goetz, D. (1998). Exploring factors influencing parents' and early childhood practitioners' beliefs about inclusion. Early Childhood Research Quarterly, 13, 107–124.

Stoiber, K. C., & Kratochwill, T. R. (2000). Empirically-supported interventions and school psychology: Rationale and methodological issues: Part I. School Psychology Quarterly, 15, 75–105.

Stoiber, K. C., Lewis-Snyder, G., & Miller, M. A. (2005). Evidence-based interventions. In S. Lee (Ed.), Encyclopedia of school psychology (pp. 196–199). New York: Sage.

Stoiber, K. C., & Vanderwood, M. L. (2008). Traditional assessment, consultation, and intervention practices: Urban school psychologists' use, important, and competence ratings. Journal of Educational and Psychological Consultation, 18, 264–292.

Sugai, G., & Horner, R. H. (1999). Discipline and behavioral support: Practices, pitfalls, and promises. Effective School Practices, 17(4), 10–22.