

# Positive Behavioral Interventions and Supports Research and Practice

Xuan Bui, Carol Quirk, and Selene Almazan



Positive Behavior Support (PBS) is a systematic, proactive approach for promoting adaptive behaviors and reducing behaviors that interfere with meaningful community participation and social relationships. A PBS approach integrates valued outcomes, behavioral and biomedical science, empirically validated procedures, and systems change to enhance an individual's quality of life and prevent or minimize problem behaviors (Carr, Dunlap, Horner, Koegel, Turnbull, & Sailor, 2002). The PBS approach emerged from the blending of the practical science of applied behavior analysis, systems change perspectives, the inclusion movement, and values for the person-centered planning. PBS strategies are based on a scientific understanding of behavior and a fundamental belief that behavior represents a message and is a form of communication. From these understandings emerge systematic and well-developed support strategies in three key categories: 1) ways to prevent the need for the problem behavior, 2) plans for teaching new skills, and 3) changes to the way others respond to a person's behavior in order to promote positive behavior change. For students, intervention is provided in the school environments, alongside the student's peers without disabilities. Positive Behavior Support emphasizes a team-based approach to intervention.

These principles, initially designed for persons with disabilities who presented significant behavioral challenges, have been refined for whole-school applications to change school-wide practices to reduce office referrals, suspensions, expulsions, and drop out from school prior to graduation. This paper describes the school-wide intervention approach with evidence of its impact on student performance.

## Effective School-Wide Interventions

School-wide PBS applies the scientific features in whole school settings in order to ensure that students have access to the most effective instructional and behavioral interventions as possible to prevent and change patterns of problem behaviors (Sugai & Horner, 2006). School-wide PBS *“provides an operational framework for achieving these outcomes. More importantly (it) is NOT a curriculum, intervention, or practice, but IS a decision making framework that guides selection, integration, and implementation of the best evidence-based academic and behavioral practices for improving important academic and behavior outcomes for all students”* ([http://www.pbis.org/school/what\\_is\\_swpbs.aspx](http://www.pbis.org/school/what_is_swpbs.aspx)). Commonly referred to as **Positive Behavioral Interventions and Supports (PBIS)**, school-wide PBS takes a multi-level approach using a continuum of behavioral and academic interventions that increase as the intensity of the problem behavior increases.

What distinguishes the PBIS approach from traditional disciplinary policies is an emphasis on prevention of problem behavior by arranging or re-arranging the school environment, including how staff interact with students. This system of prevention encompasses three tiers: primary/universal (Tier I), secondary (Tier II), and tertiary (Tier III). Tier I are the universal strategies that are systematically designed and implemented across the school and in all classrooms and school environments to reinforce positive pro-social behavior. Faculty and staff routinely provide a high ratio of positive reinforcement for the behaviors identified as desired across all school areas; a defined continuum of consequence procedures are similarly developed. Those students who do not respond to these clear expectations and reinforcements are identified and targeted to Tier II interventions. At this level, a group intervention (as described later in this document) is systematically designed on the basis of the characteristics of the behavioral offenses and the motivators for the students. Tier III represents those individualized strategies,

often needed for students whose behavior is affected by their disability or for whom the first 2 Tiers of interventions were not successful. These individualized interventions are developed on the basis of an assessment of the function served by the problem behavior.

School teams are trained in strategies for data collection, data-based decision-making, design and implementation of evidence-based interventions, and school-based systems to support the ongoing use of these practices. According to the national PBIS center ([www.pbis.org](http://www.pbis.org)), schools that are effective with PBIS establish systems with the capacity to implement these practices with integrity and durability, and have teaching and learning environments that are:

- less reactive, aversive, dangerous, and exclusionary;
- more engaging, responsive, preventive, and productive;
- address classroom management and disciplinary issues (e.g., attendance, tardies, antisocial behavior);
- Improve supports for students whose behaviors require more specialized assistance (e.g., emotional and behavioral disorders, mental health); and
- maximize academic engagement and achievement for all students.

## Primary/Universal/Tier I Interventions

At the primary level, the focus is on universal strategies designed to teach and reward expected social behaviors for all students. The core elements of this tier include defining and explicitly teaching school-wide behavioral expectations, developing a reward system to reinforce expectations, having a continuum of consequences for problem behavior, and data-based decision making. Until recently, all of the studies on school-wide PBIS were evaluative (primarily case studies) and did not employ experimental designs (Horner & Sugai, 2009). Evaluative studies examining the outcomes of primary prevention efforts consistently show reductions in office discipline referrals (ODR) and in some cases, a decrease in student suspensions.

**State Level Studies:** Maryland, North Carolina, Iowa, and New Hampshire conducted state level studies to examine the impact of their multi-year school-wide PBIS efforts. In **Maryland**, PBIS in 467 elementary schools resulted in 43% fewer office discipline referrals (ODRs) when compared with the national average. Comparable results were seen at the middle and high school levels, with middle schools reporting 33% fewer ODRs and high schools reporting 37% fewer ODRs when compared to similar schools in a national database. Furthermore, schools noted a significant reduction in suspension rates (Barrett, Bradshaw, & Lewis-Palmer, 2008).

As of the 2008-2009 school year, **North Carolina** had 737 schools implementing school-wide PBIS (Reynolds, Irwin, & Algozzine, 2009). The impact of this widespread application has been positive compared with national office referral averages. In K-6 schools, the North Carolina average was .29 ODRs per 100 students per day while the

### State Level Studies:

- Decrease in office referrals, some significant
- Some states report significant reduction in suspensions
- School-wide Evaluation Tool revealed high levels of implementation

national average was .34. Similar results were noted for grades 6-9, with North Carolina schools reporting .84 ODRs compared to the national average of .92. Grades 9-12 reported .85 ODRs compared to 1.05 at the national level. K8 and K12 schools had even more favorable comparisons: North Carolina reported .62 ODRs while national data reported 1.00 ODRs (Reynolds et al., 2009).

Mass-Galloway, Panyan, Smith, and Wessendorf (2008) evaluated **Iowa's** statewide initiative that includes 103 active schools with data collected for 72 sites. The School-wide Evaluation Tool (SET) and the Team Implementation Checklist (TIC) were utilized to determine the extent to which schools were implementing the practice with fidelity. These data combined to reflect high levels of implementation with mean scores of 80% for the SET and

scores at or above 80% for the TIC for 7 out of 8 initial demonstration schools. In terms of behavior change in students, complete data from 24 schools revealed an average decrease of 42% for ODRs over a two-year period. It should be noted that one cohort group (7 schools) experienced an increase in ODRs that researchers attributed to the schools increased awareness and attention to reporting behaviors.

A smaller evaluation of universal PBIS efforts was conducted by Muscott and Mann (2008) for 28 early childhood programs and K-12 schools in **New Hampshire** who started their initiative in 2002. An examination of the results showed that the overwhelming majority of schools were able to implement school-wide PBIS interventions within 2 years and to continue implementation at high fidelity levels the following year. Significant student outcomes were reported as a result of the initiative. Across the 28 schools and programs, a reduction of 6,010 ODRs was noted as well as a 1,032 fewer suspensions. The data revealed that the middle and high schools experienced the most benefit.

**School-based Studies and Fidelity of Implementation:** The majority of school-wide intervention efforts have been at the elementary and middle school level (Flannery, Sugai, and Anderson, 2009). However, there is an emerging database examining the outcomes of universal prevention initiatives at the early childhood and high school grades. One study at the preschool level examined the effects of school-wide PBIS in a community-based preschool setting on the behavior of two 3-year-old girls. Using A-B-A-B designs, data on the two girls revealed reductions in challenging behaviors while at the same time showing increases in instructional engagement (Duda, Dunlap, Fox, Lentini, & Clark, 2004). Data gathered on the fidelity of implementation by staff showed some components of PBIS to be in place while others absent.

Similar fidelity results were reported in another preschool study conducted by Benedict, Horner, and Squires (2007). They studied the implementation practices of 15 early childhood settings and determined that, on average, few PBIS features (30.79%) were in place. However, information collected on the impact of technical assistance on four teachers' universal practices showed a functional relationship. Other researchers have examined the impact of primary tier practices in the high school grades and report similar concerns over fidelity of implementation at this level. Bohanon et al. (2006) used qualitative interviews, observations, and the SET to measure impact of PBIS at an urban high school. While the SET data revealed overall high levels of implementation (80%), researchers noted that getting staff to directly teach the behavioral expectations was a "very challenging" piece of the program." However, student data did seem to confirm that their PBIS efforts met with some success. Researchers reported that by the third year of adoption, ODRs decreased by 20% and the proportion of students who required secondary and tertiary supports also were reduced.

### Preschools & High Schools:

- Emerging area of research
- Preliminary data shows decrease in ODRs
- Significant challenges noted in staff support and participation

Related concerns over implementation challenges were reported in a study by Flanner, Sugai, and Anderson (2009) that involved a survey of high schools implementing universal interventions. Forty-three respondents (members of PBS teams) represented 12 different states with the criteria being that schools had school-wide PBS features in place for at least a year. Findings indicate that **securing the support and participation of high school faculty is a significant**

**challenge.** For example, only 30% of respondents reported that 76% or more of staff supported implementation and only 26% reported this same level of staff participation. In addition to this lack of buy-in and support from staff, respondents noted the same concerns for administrators. Respondents also offered some practical recommendations to researchers including the need to revisit the 80% implementation criteria, investing more time in promoting staff support, and building student buy-in by starting with 9<sup>th</sup> graders and phasing in older students.

**Universal Supports in Other Settings:** Several studies examined the impact of PBIS in specific settings such as on the playground and riding the bus. Lewis, Colvin, and Sugai (2000) studied specific strategies that were universally

applied on an elementary playground: a pre-correction and active supervision strategy. They found that the pre-correction strategy reduced the frequency of problem behavior but did not increase the rate of active supervision by playground monitors.

A study at an urban public school targeting student bus-riding behavior through the use of a whole-school intervention met with more success. Putnam, Handler, Ramirez-Platt, and Luisella (2003) collaborated with school personnel and drivers to identify appropriate behavior, train drivers to deliver positive reinforcement, and reward student performance using a weekly lottery. This multi-component intervention resulted in decreases in bus discipline referrals as well as suspensions. Furthermore, the decrease was maintained over three consecutive years of the study due to the efforts of school personnel adopting the intervention without the use of consultants. Researchers attributed staff adoption to the fading of consultant support instead of an abrupt termination.

**Integrated Approach:** Recently, this three-tier model of prevention and intervention has been applied to improving the academic skills of students who are not successful with the universal teaching approach used by the classroom teacher. Called “Response to Intervention” (RtI), students are systematically identified as being at risk based on math or reading performance, and a secondary level intervention is designed for the group of struggling learners. Individualized instruction (often specialized or special education) is designed for “Tier III” students who have not been successful at small group interventions. While much of the early literature on the RtI approach described the interventions in terms of the size of the group (e.g., small group or individual), what has come to distinguish these interventions is the size of the group for which the intervention is designed, NOT the group in which it is delivered.

### Integrating Behavior & Academic Interventions:

- Combined reading & behavior approach yields larger effect size than reading-alone or behavior-alone
- Reading & behavior data in early grades predicts discipline referrals in 5<sup>th</sup> grade

Some studies have examined the effects of academic interventions combined with PBIS, an “integrated” model of interventions. Stewart, Benner, Martella, and Marchand-Martella (2007) conducted a meta-analytic review on three-tier models of reading and behavior and analyzed data for 5 studies focused on reading, 7 on behavior, and 5 using an integrated model. Findings revealed a large effect size for the integrated model (.53) compared to the effect sizes for reading alone (.30) and behavior alone (.18).<sup>1</sup> The integrated approach seemed to produce larger reading gains than a reading-alone or behavior-alone approach. Similar results were reported in McIntosh, Chard, Boland, and Horner’s (2006) study, where 3% of third grade students required additional reading support compared with the national rate of 40%. It seems likely that reducing problem behavior results in increased access to reading instruction thereby improving students’ responsiveness. Another finding was the moderate effect size on behavior in an integrated approach (.31) in comparison to a behavior-only model (.28). Similarly, McIntosh et

---

<sup>1</sup> Researchers use effect size to translate the results of a given study in order to determine the impact of an instructional technique on achievement. An effect size shows the increase or decrease on achievement of students who are exposed to the instructional technique being studied (experimental group) in standard deviation units. Standard deviation is a measurement of variability that shows how scores are clustered or dispersed in relation to the mean. For example, an effect size of 1.0 means that the average score of students in the experimental group is 1.0 standard deviation higher than students in the control group (not exposed to the instructional technique). This means that a student at the 50th percentile in the experimental group would be 1.0 standard deviation higher than the student at the 50th percentile in the control group. Translated into percentile gains, an effect size of 1.0 means a percentile gain of 34 points (one standard deviation above the mean encompasses 34% of scores), assuming the average of the group is the 50th percentile. Generally speaking, effect sizes of .20 are considered small, .50 medium, and .80 large. Boston, C. (2002). Effect size and meta-analysis. ERIC Clearinghouse on Assessment and Evaluation, College Park, MD. Retrieved from [www.eric.ed.gov](http://www.eric.ed.gov)

al. found that 8% of third graders in a district needed additional behavior support in the integrated model compared to 14% nationally.

Other comparable outcomes were reported in a study on a school district that had been implementing an integrated model for 10 years. For its efforts, the district realized a sustained reduction in ODRs and a rise in the percentage of students who were on track in meeting early reading benchmarks (Sadler & Sugai, 2009). Further evidence for the positive impact of universal behavioral supports on academic achievement was documented in an urban middle school. Lassen, Steele, and Sailor (2006) examined the relationship of school-wide PBS induced reductions in ODRs to academic achievement over a 3-year period. Findings from this period revealed significant decreases in ODRs and suspensions and increases in standardized math and reading scores. In addition, regression analyses proposed a significant relationship between problem behavior and academic performance. McIntosh, Horner, Chard, Boland, and Good (2006) explored further the relationship between reading and behavioral performance in a longitudinal analysis of academic skills and problem behavior from kindergarten through fifth grade. Data revealed that both reading and behavior variables at the earlier grades predicted the number of discipline referrals in fifth grade. Similar interaction between academic scores and discipline referrals were reported in a study targeting students transitioning from eighth to ninth grade. Researchers noted significant interactions between academic scores and ODRs within and across the grades (McIntosh, Flannery, Sugai, Braun, & Cochrane, 2008).

**Randomized Control Trials:** While evaluative studies comprise the large majority of the research on the universal tier strategies, there are some recently completed randomized control trials assessing the efficacy of school-wide PBIS. One such study was conducted with elementary schools in Hawaii and Illinois where technical assistance was provided by state personnel over a 3-year period. Researchers documented the functional relationship between improved use of universal interventions and improvements in the perceived safety of the school as well as the number of third graders meeting or exceeding state reading assessment standards. Some schools reported a 50% reduction in office referrals over the 3-year period although the researchers noted the absence of experimental control for this variable (Horner, R. H., Sugai, G., Smolkowski, K., Eber, L., Nakasato, J., Todd, A. W., et al., 2009). In an experimental trial randomized at the elementary school level (37), Bradshaw, Mitchell, and Leaf (2008) found that students in PBIS schools were 35% less likely to be sent to the principal's office than those in comparison schools. In addition, data from 2,596 staff indicated a significant effect of school-wide PBS on the schools' organization health including improved staff affiliation. Currently, there are other randomized control trials in progress that involve middle schools and effectiveness studies across three states (Horner & Sugai, 2009).

## Secondary/Tier II Interventions

At the secondary tier, interventions are designed to address the generally 5 to 15% of students who require more intensive support in addition to those available at the universal level. Secondary strategies are characterized by their ability to serve multiple students with few resources. Examples of secondary interventions include social skills training groups, daily behavior report cards, and homework clubs. Within the three-tier model, Tier II interventions have received less research inquiry than primary or tertiary interventions (McIntosh, Campbell, Carter, & Dickey, 2009).

**Check-In/Check-Out:** A Tier II strategy that has received attention in the research literature is Check-In/Check-Out (CICO), a type of daily behavior report card. In CICO, students check in with a staff member at the start of the day to receive their CICO card and verbal encouragement. In addition to checking out at the end of the day, opportunities are also provided throughout the day for students to receive feedback. A number of investigations have documented CICO's effectiveness in reducing problem behavior and increasing students' academic engagement (Fairbanks, Sugai, Guardino, & Lathrop, 2007). One such study conducted by Todd, Campbell, Meyer, and Horner (2008) followed four elementary age students with data showing a reduction in problem behaviors and ODRs. During implementation of CICO, all four students experienced a reduction of 15%-19% in problem behaviors

compared with baseline levels. In addition, ODRs decreased from .14 per day at baseline across the participants to .04 during CICO implementation. CICO's efficacy was further documented in studies conducted by Hawken and Horner (2003) and March and Horner (2002). Several studies have explored the role of function in the delivery of CICO as a secondary tier strategy. McIntosh et al. (2009) examined the extent to which function of problem behavior moderates the effectiveness of CICO. Results showed that all students experienced an increase in pro-social behaviors and a decrease in office referrals however significant differential effects were noted based on the hypothesized function of the behavior. For students with behavior maintained by social attention, the implementation of CICO produced statistically significant improvement in problem behavior. Students with behavior that was motivated by a desire to escape an event or activity did not experience significant improvement. Comparable results were produced in Campbell and Anderson's (2008) study of the use of function-based support in the CICO intervention for two typical 10-year-old students. At baseline, CICO alone did not result in significant improvements but with the addition of function-based supports, problem behavior significantly decreased (31% to 10% of intervals and 27% to 12% of intervals). Similar outcomes were reported in March and Horner's (2002) investigation into the utility of functional behavioral assessment (FBA) for middle school students. These findings suggest that function may play a critical role in students' response to secondary interventions and hold implications for schools to deliver multiple function-based interventions.

### Check-In/Check-Out:

- Reductions in office referrals
- Increased academic engagement
- Significant decreases in problem behavior

**Check & Connect:** Originating from a collaborative partnership at the Institute on Community Integration at the University of Minnesota, Check & Connect is a model to promote students' engagement with school and to increase school completion. Check & Connect was first developed for urban middle school students with learning and behavioral challenges but is now applied in K-12 settings in urban and suburban areas. The model relies on close monitoring of school performance, mentoring, case management, and other supports (Morse, Anderson, Christenson, & Lehr, 2004).

### Check & Connect:

- Significantly higher % of students in control group dropped out compared to intervention group
- Students in intervention group earned almost twice as many credits
- Perceptions of "closeness" correlated with improved outcomes

A comprehensive review of dropout interventions indicates that the research base has been mostly predictive or descriptive, and the methodology used to determine effectiveness has been of low quality (Lehr, Hanson, Sinclair, & Christenson, 2003). To date, **Check & Connect is the only dropout intervention that was found to have positive effects for staying in school** (US Dept. of Ed's What Works Clearinghouse). In a randomized controlled trial of 94 high school students (47 intervention, 47 control), researchers reported that a significantly higher percentage of students in the control group (30% compared to 9%) had dropped out at the end of the first follow-up year (Sinclair, Christenson, Evelo, & Hurley, 1998). Additionally, students in the intervention group had earned on average 12.13 credits compared to 6.63 credits in the control group. In a replication study conducted by Sinclair, Christenson, and Thurlow (2005), 144 students were followed for 4 to 5 years until grade 12 at an urban high school. At the end of grade 12, 39% of Check & Connect students had dropped out compared with 58% in the control group. In both of these randomized control trials, statistically significant gains in the domains of staying in school and progressing in school were noted.

Anderson, Christenson, Sinclair, and Lehr (2004) investigated the impact of the quality (closeness) of relationships between Check & Connect staff and students at an elementary school. Findings indicate that student and interventionist perceptions of the closeness of their relationship were associated with increased school attendance. Furthermore, interventionist perceptions of their relationships correlated with teacher-rated

academic engagement behaviors of persistence, work completion, and preparedness. This study provides evidence on the importance of the “connect” piece of the Check & Connect model.

**Behavior Education Program:** Another secondary tier intervention that has received a good deal of research scrutiny is the Behavior Education Program (BEP). BEP is essentially a modified version of Check-In/Check-Out that incorporates a family component. March and Horner (2002) and Hawken (2006) studied the impact of the BEP on decreasing the rates of ODRs with middle school students and found that 67% and 70% of students who received intervention experienced reductions in referrals. A study examining the effectiveness of BEP on discipline referrals at an elementary school revealed similar outcomes with 75% of students showing statistically significant decreases in ODRs (Hawkins, McLeod, & Rawlings, 2007). Comparable data was produced in another elementary study where 67% of students experienced decreases in referrals (Filter, Benedict, Horner, Todd, & Watson, 2007). Similarly, an investigation conducted in an urban elementary school setting showed positive gains for the majority of students (McCurdy, Kunsch, & Reibstein, 2007). While the majority of research to date on BEP has been conducted at the elementary and middle school level, Hawken and Johnston (2007) offer some practical modifications and provide a case example for application at the preschool level.

#### Behavior Education Program:

- 70% of students experiencing reductions in discipline referrals

**First Step to Success:** First Step to Success is another secondary intervention with documented effectiveness. This particular intervention targets students in the early elementary years who are at risk for antisocial behavior. First Step incorporates behavioral intervention techniques, positive reinforcement, social skills training, teacher/parent collaboration, and time-out/response cost. Sprague and Perkins (2009) evaluated previous findings using a multiple baseline design. Results indicated that all students improved on measures of problem behavior, academic engaged time, and teacher ratings of behavioral adjustment. Another investigation conducted by Beard-Jordan and Sugai (2004) found that teacher and parent involvement in this intervention resulted in decreased problem behavior that was maintained one year after implementation. Maintenance of behavioral changes was also documented in a study evaluating the effects of First Step on 4 students over a 4 year period (Golly, Sprague, Walker, Beard, & Gorham, 2000). Congruent with other studies examining the role of function-based support, Carter and Horner (2007) conducted a case study with a six-year old to determine if First Step’s effectiveness would be enhanced with function-based features. At baseline, the student engaged in problem behavior during 37% of intervals, with daily ranges of 20%-60% and an increasing trend noted on the last 7 days. During teacher implementation of the intervention with added function-based supports (for example: the student received points that he could then award to another student to increase peer attention for appropriate behavior), problem behavior decreased to 8% of intervals with a slight decreasing trend. These results further lend support to the addition of FBA procedures to the design and implementation of Tier II interventions.

#### First Step to Success:

- Decrease in problem behavior with maintenance noted
- Added function-based supports resulted in significant reductions of problem behavior

**Social Skills Training:** Social skills training (SST) has long been advocated as an intervention for students who present with challenging behavior (Lane, Wehby, Menzies, Doukas, Munton, & Gregg, 2003). While SST has been quite popular, it has not been shown to be a strong intervention for students with high incidence disabilities (Mathur, Kavale, Quinn, Forness, & Rutherford, 1998). Meta-analyses on studies revealed that students improved social competence anywhere from 8% to 31%. Gresham, Sugai, and Horner (2001) offer a likely explanation for these weak effects: the lack of attempts by researchers to match the treatment to the type of social skill deficit that a student may experience. For example, SST for deficits in social acquisition skills look different from interventions for performance or fluency problems (Gresham, Sugai, & Horner, 2001). Lane et al. (2003) address this concern in their study of 7 typically developing eight and nine-year-olds identified by teachers as being at risk

for antisocial behavior. Based on screening measures, social skills training was customized at this secondary tier. All of the students experienced rapid decreases in their disruptive behavior, and increases in academic engaged time. Allowing for slight variability, these gains were maintained by six out of seven students in the first phase of follow-up. One interesting study of SST was conducted by Presley and Hughes (2000) that featured the use of peer-delivered social skills instruction to four high school students identified with significant behavioral challenges. Researchers found general education peers to be effective as trainers and target subjects were able to execute the anger management strategy in follow-up role plays as well as demonstrate modest gains in generalization of skills.

## Tertiary/Tier III Interventions

Tertiary interventions are designed to serve 1%-5% of a school's population whose behavioral challenges require the most intensive supports. Core features of this level of intervention include the use of functional behavioral assessment, individualized behavioral supports, a comprehensive team approach, and the use of data to guide decision-making. Because of positive behavior support's origins in serving people with developmental disabilities, research on tertiary interventions is perhaps the strongest of the databases in school-wide PBS with the majority of the research using single-case designs (Horner & Sugai, 2009). The roots of PBS are firmly planted in the work of applied behavior analysis that contributed much of the earlier research on these interventions (Association for Positive Behavior Supports, [www.apbs.org](http://www.apbs.org)).

**Earlier Research:** A critical element to the use of PBS at the Tier III level is the implementation of a functional behavioral assessment (FBA) to gain insight into the predictors and maintenance variables associated with problem behavior. Much of the work that led to the development of FBA was conducted in the field of applied behavior analysis (Association for Positive Behavior Supports, [www.apbs.org](http://www.apbs.org)). An important literature review that contributed to policy, program development, and funding for PBS was conducted by Carr and his colleagues (1999). Carr and researchers conducted a comprehensive search of peer-reviewed articles, published between 1985 and 1996, that involved individuals who had developmental disabilities and challenging behavior. Of these articles: 109 out of 219 met the requirements for the review. Several important findings were seen:

- PBS is effective in one-half to two-thirds of cases; long-term maintenance and quality of life outcomes are not frequently reported
- Success rates nearly double when interventions are based on functional assessment
- PBS is widely applicable to people with developmental disabilities within typical settings
- Body of research is growing in the areas of assessment and fixing deficient environments

The researchers recommend the importance of creating standards for assessment-based intervention which is the cornerstone of PBS for individuals experiencing severe behavioral challenges.

**Functional Behavior Assessment & Behavior Intervention Plans:** Benazzi, Horner, and Good (2006) evaluated the impact of the composition of the behavior support team on the technical adequacy and contextual fit of behavior intervention plans (BIP) derived from FBAs. Technical adequacy tended to be rated high if specialists alone, or teams that included a specialist, designed the plan. Contextual fit tended to be rated high when teams alone or teams working with a specialist developed the plan. Team members preferred the plans developed by teams alone or teams with a specialist over plans developed by the specialist alone. A demonstration study extended this line of research by looking at acceptability ratings by staff members who were undergoing training and were implementing function-based supports. The highest acceptability ratings were obtained on items related to whether the team-based implementation of FBA was effective and sustainable (Crone, Hawken, & Bergstrom, 2007). This confirms the findings reported by Benazzi et al. (2006). Borgmeier and Horner (2006) further explored the role of staff in the development of FBAs by examining the use of informant confidence ratings in identifying accurate hypothesis statements. Findings indicated limitations to the use of ratings to distinguish accurate from inaccurate hypotheses among school staff that have a broad range of contact with the target student. However, researchers did report that informants who were highly confident and identified accurate hypotheses had

significantly more contact with the target student than those staff that had low confidence ratings or inaccurate hypotheses.

The goal of a well-executed FBA is to result in an effective BIP that meets the support needs of students. Ingram, Lewis-Palmer, and Sugai (2005) compared the effectiveness of plans based on a FBA vs. behavior intervention plans that were not based on FBA information for two middle school students. At baseline, problem behaviors were observed in 49% of intervals for one student. Implementation of a function-based Behavior Implementation Plan (BIP) resulted in an immediate and stable reduction to 9% of intervals. Introduction of the non-function-based BIP resulted in an immediate increase to baseline levels of problem behavior; with the re-introduction of function-based supports there was an immediate decrease to 6% of intervals. Very similar results were reported for the second student with both students experiencing low levels and low variability in problem behaviors during function-based interventions. Comparable results were produced in Newcomer and Lewis' (2004) examination of FBAs conducted on 3 elementary school students. Researchers found that interventions based on functional assessment were more effective than alternative approaches for all three students. These findings highlight the necessary and critical role of FBAs in the development of BIPs.

While it is clear in the literature that conducting FBAs leads to more effective BIPs, the question of whether school staff are able to use the outcomes of FBAs to design effective interventions has received little attention. A team of researchers addressed this question by examining the relationship between FBAs and selected interventions by school-based teams at four elementary schools. Using a total of 31 cases, findings indicated that school-based personnel were more likely to select punitive and exclusionary strategies regardless of the identified function (Scott, McIntyre, Liaupsin, Nelson, Conroy, & Payne, 2005). Specifically, teams suggested exclusionary strategies in 70% of cases compared to experts suggesting no exclusionary strategies for the 31 cases. In turn, experts suggested more instructional strategies and less negative consequences than school teams. Furthermore, analysis revealed that the team-selected strategies did not appear to be related to the identified function. So while FBA may be utilized more by school staff (McIntosh, Borgmeier, Anderson, Horner, Rodriguez, & Tobin, 2008), the question of whether the process results in an effective BIP that is function-based and positive still remains.

***Linking Individual Behavior Interventions and Academic Performance:*** An increasing number of studies are connecting behavior and academic interventions to the decrease of challenging behavior (Horner & Sugai, 2009). One such study examined the effects of self-management training (personal cassette player, self-monitoring card, self-recruitment of peer and teacher attention) and found an increase in work completion and on-task behavior for a 10-year-old girl with an intellectual disability. Data collected by Brooks, Todd, Tofflemoyer, and Horner (2003) showed an increase in academic engagement (from 11% to 77%) and work completion (0% to 100%) in a fourth grade classroom. Another investigation focusing on increasing academic engagement was conducted by Preciado, Horner, and Baker (2009) with 4 English language learners who were struggling readers. An FBA was conducted using interviews and archival review to verify the function of students' problem behavior. A language-matched instructional priming program was developed as part of the intervention package. During the intervention phase, the students' interval of problem behaviors decreased 35%, 62%, 34%, and 11% from baseline data and were a much closer match to peers' level of problem behavior. Additionally, academic engagement levels increased by 32%, 66%, 38%, and 13% compared to baseline data. Researchers also noted that all four students demonstrated an increase in reading skills as measured by words read per minute. A third study focused on function-based interventions for a student with a learning disability who exhibited high rates of challenging behavior during reading instruction. Burke, Hangan-Burke, and Sugai (2003) gathered information using an FBA protocol that resulted in a hypothesis of escape-maintained behavior triggered by reading comprehension tasks. An intervention targeting daily pre-teaching of vocabulary concepts was implemented and results indicated that pre-teaching produced much higher levels of task engagement. Researchers reported a mean of 99% in the experimental condition compared to a mean of 38% in the control condition. These three studies, while small in sample, represent a diverse group of students who experienced gains in behavioral and academic performance when interventions were linked in a purposeful manner.

## REFERENCES

- Anderson, A. R., Christenson, S. L., Sinclair, M. F., & Lehr, C. A. (2004). Check & Connect: The importance of relationships for promoting engagement with school. *Journal of School Psychology, 42*(2), 95-113.
- Barrett, S., Bradshaw, C., & Lewis-Palmer, T. (2008). Maryland state-wide PBIS initiative. *Journal of Positive Behavior Interventions, 10*, 105-114.
- Beard-Jordan, K., & Sugai, G. (2004). First Step to Success: An early intervention for elementary children at risk for antisocial behavior. *Behavioral Disorders, 29*, 396-409.
- Benazzi, L., Horner, R.H., & Good, R.H. (2006). Effects of behavior support team composition on the technical adequacy and contextual fit of behavior support plans. *Journal of Special Education 40*(3), 160-170.
- Benedict, E., Horner, R.H., & Squires, J. (2007). Assessment and implementation of Positive Behavior Support in preschools. *Topics in Early Childhood Special Education, 27*(3), 174-192.
- Bohanon, H., Fenning, P., Carney, K., Minnis, M., Anderson-Harriss, S., Moroz, K., Hicks, K., Kasper, B., Culos, C., Sailor, W., & Piggott, T. (2006). School-wide application of positive behavior support in an urban high school: A case study. *Journal of Positive Behavior Interventions, 8*(3), 131-145
- Borgmeier, C., & Horner, R.H. (2006). An evaluation of the predictive validity of confidence ratings in identifying accurate functional behavioral assessment hypothesis statements. *Journal of Positive Behavior Interventions, 8*(2), 100-105.
- Bradshaw, C. P., Mitchell, M. M., & Leaf, P. J. (2009). Examining the effects of school-wide positive behavioral interventions and supports on student outcomes: Results from a randomized controlled effectiveness trial in elementary schools [Online]. *Journal of Positive Behavior Interventions*.
- Bradshaw, C.P., Koth, C.W., Bevans, K.B., Jalongo, N., & Leaf, P.J. (2008). The impact of school-wide Positive Behavioral Interventions and Supports (PBIS) on the organizational health of elementary schools. *School Psychology Quarterly, 23* (4), 462-473
- Brooks, A., Todd, A. W., Tofflemoyer, S., & Horner, R. H. (2003). Use of functional assessment and a self-management system to increase academic engagement and work completion. *Journal of Positive Behavior Intervention, 5*(3), 144-152.
- Burke, M. D., Hagan-Burke, S., & Sugai, G. (2003). The efficacy of function-based interventions for students with learning disabilities who exhibit escape-maintained problem behavior: Preliminary results from a single case study. *Learning Disability Quarterly, 26*(1), 15-25.
- Campbell, A. & Anderson, C. M., (2008). Enhancing effects of Check-in/Check-out with function-based support. *Behavioral Disorders, 33*(4), 233-245.
- Carr, E. G., Dunlap, G., Horner, R. H., Koegel, R. L., Turnbull, A. P., & Sailor, W. (2002). Positive behavior support: Evolution of an applied science. *Journal of Positive Behavior Interventions, 4*, 4-16.
- Carr, E. G., Horner, R. H., Turnbull, A. P., Marquis, J. G., Magito McLaughlin, D., McAtee, M. L., Smith, C. E., Anderson Ryan, K., Ruef, M. B., & Doolabh, A. (1999). Positive behavior support for people with developmental disabilities: A research synthesis (American Association on Mental Retardation Monograph Series). Washington, D.C.: *American Association on Mental Retardation*.

- Carter, D. R., & Horner, R.H. (2007). Adding functional behavioral assessment to First Step to Success: A case study. *Journal of Positive Behavior Interventions, 9(4)*, 229-238.
- Crone, D., Hawken, L., & Bergstrom, M., (2007). A demonstration of training, implementing and using functional behavioral assessment in 10 elementary and middle school settings. *Journal of Positive Behavior Interventions, 9(1)*, 15-29.
- Duda, M.A., Dunlap, G., Fox, L., Lentini, R., & Clarke, S. (2004). An experimental evaluation of positive behavior support in a community preschool program. *Topics in Early Childhood Special Education, 24(3)*, 143-155
- Fairbanks, S., Sugai, G., Guardino, D., & Lathrop, M. (2007). Response to intervention: An evaluation of a classroom system of behavior support for second grade students. *Exceptional Children, 73*, 288-310.
- Filter, K., Benedict, E A., Horner, R. H., Todd, A. W., & Watson, J. (2007). Check-in/Check-out: A post hoc evaluation of an efficient secondary level intervention for reducing problem behaviors in schools. *Education and Treatment of Children, 30*, 69-84.
- Flannery, K.B., Sugai, G., Anderson, C.M. (2009). School-wide positive behavior support in high school: Early lessons learned. *Journal of Positive Behavior Interventions, 11 (3)*, 177-85.
- Galloway, R., Panyan, M., Smith, C. & Wessendorf, S. (2008) Systems change with school-wide positive behavior supports: Iowa's work in progress. *Journal of Positive Behavior Interventions, 10(2)*, 129-135.
- Golly, A., Sprague, J., Walker, H. M., Beard, K., & Gorham, G. (2000). The First Step to Success program: An analysis of outcomes with identical twins across multiple baselines. *Behavioral Disorders, 25(3)*, 170-182.
- Gresham, F. M., Sugai, G. & Horner, R. H. (2001). Interpreting outcomes of social skills training for students with high-incidence disabilities. *Exceptional Children, 67(3)*, 331-334.
- Hawken, L. S. (2006). School psychologists as leaders in the implementation of a targeted intervention: The Behavior Education Program (BEP). *School Psychology Quarterly, 21*, 91-111.
- Hawken, L. S., & Horner, R. H. (2003). Evaluation of a targeted group intervention within a schoolwide system of behavior support. *Journal of Behavioral Education, 12*, 225-240.
- Hawken, L. H. & Johnston, S. (2007). Preventing severe problem behavior in young children: The Behavior Education Program. *Journal of Early and Intensive Behavior Intervention, 4(3)*, 599-613.
- Hawken, L. S., McLeod, K.S., & Rawlings, L. (2007). Effects of the Behavior Education Program (BEP) on office discipline referrals of elementary school students. *Journal of Positive Behavior Interventions, 9*, 94-101.
- Horner, R. H., Sugai, G., Smolkowski, K., Eber, L., Nakasato, J., Todd, A. W., et al. (2009). A randomized, wait-list controlled effectiveness trial assessing school-wide positive behavior support in elementary schools. *Journal of Positive Behavioral Interventions, 11*, 133–144.
- Horner, R., & Sugai, G. (2009). Is school-wide positive behavior support an evidence-based practice? Retrieved from [www.pbis.org](http://www.pbis.org).
- Ingram, K., Lewis-Palmer, T., & Sugai, G. (2005). Function-based intervention planning: Comparing the effectiveness of FBA indicated and contra-indicated intervention plans. *Journal of Positive Behavior Interventions, 7*, 224-236.

- Lane, K. L., Wehby, J., Menzies, H. M., Doukas, G. L., Munton, S. M., & Gregg, R. M. (2003). Social skills instruction for students at risk for antisocial behavior: The effects of small-group instruction. *Behavioral Disorders, 28*(3), 229-248.
- Lassen, S., Steele, M., & Sailor, W. (2006). The relationship of school-wide positive behavior support to academic achievement in an urban middle school. *Psychology in Schools 43*(6), 701-712.
- Lehr, C. A., Hanson, A., Sinclair, M. F., & Christenson, S. L. (2003). Moving beyond dropout prevention towards school completion: An integrative review of data-based interventions. *School Psychology Review, 32*, 342-364.
- Lewis, T. J., Colvin, G., & Sugai, G. (2000). The effects of precorrection and active supervision on the recess behavior of elementary school students. *Education and Treatment of Children, 23*, 109-121.
- March, R.E., & Horner, R.H. (2002). Feasibility and contributions of functional behavioral assessment in schools. *Journal of Emotional and Behavioral Disorders, 10*, 158-170.
- McCurdy, B. L., Kunsch, C., & Reibstein, S. (2007). Secondary prevention in the urban school: Implementing the Behavior Education Program. *Preventing School Failure, 12-19*.
- McIntosh, K., Borgmeier, C., Anderson, C., Horner, R.H., Rodriguez, B., & Tobin, T. (2008). Technical adequacy of the Functional Assessment Checklist for Teachers and Staff FBA intervention measure. *Journal of Positive Behavior Interventions, 10*(1), 33-45.
- McIntosh, K., Campbell, A., Carter, D., & Dickey, C. (2009). Differential effects of a Tier II behavioral intervention based on function of problem behavior. *Journal of Positive Behavior Interventions, 11*(2), 82-93.
- McIntosh, K., Chard, D. J., Boland, J. B., & Horner, R. H. (2006). A demonstration of combined efforts in schoolwide academic and behavioral systems and incidence of reading and behavioral challenges in early elementary grades. *Journal of Positive Behavioral Interventions, 8*, 145-154.
- McIntosh, K., Flannery, K. B., Sugai, G., Braun, D., & Cochrane, K. L. (2008). Relationships between academics and problem behavior in the transition from middle school to high school. *Journal of Positive Behavior Interventions, 10*(4), 243-255.
- McIntosh, K., Horner, R.H., Chard, D., Boland, J., & Good, R. (2006). The use of reading and behavior screening measures to predict non-response to school-wide positive behavior support: A longitudinal analysis. *School Psychology Review 35*, 275-291.
- Mathur, S., Kavale, K., Quimn, M., Forness, S., & Rutherford, R. (1998). Social skills intervention with students with emotional and behavioral problems: A quantitative synthesis of single subject research. *Behavioral Disorders, 23*, 193-201.
- Morse, A. B., Anderson, A. R., Christenson, S. L., & Lehr, C. A. (2004). Promoting school completion. *Principal Leadership, 4*(6), 9-13.
- Muscott, H., & Mann, E. (2008). Positive behavioral interventions and supports in New Hampshire: Effects of large-scale implementation of schoolwide positive behavior support on student discipline and academic achievement. *Journal of Positive Behavior Interventions, 10*(3), 190-205.
- Newcomer, L. L. & Lewis, T. J. (2004). Functional Behavioral Assessment: An Investigation of Assessment Reliability and Effectiveness of Function-Based Interventions. *Journal of Emotional and Behavioral Disorders, 12*(3), 168-181

- Preciado, J., Horner, R.H., & Baker, S. (2009). Using a function-based approach to decrease problem behavior and increase academic engagement for Latino English Language Learners. *Journal of Special Education*, 42 (4), 227-240.
- Presley, J. A. & Hughes, C., (2000). Peers as teacher of anger management to high school students with behavioral disorders. *Behavioral Disorders*, 25(2), 114-130.
- Putnam, R. F., Handler, M. W., Ramirez-Platt, C. M., & Luiselli, J. K. (2003). Improving student bus-riding behavior through a whole-school intervention. *Journal of Applied Behavior Analysis*, 36, 583-589.
- Reynolds, H., Irwin D., & Algozzine, R., (2009) *North Carolina Positive Behavior Supports Evaluation Report 2007-2008*. Raleigh, NC: Department of Public Instruction, Exceptional Children Division, Behavioral Support Services.
- Sadler, C, & Sugai, G. (2009) Effective behavior and instructional support: A district model for early identification and prevention of reading and behavior problems. *Journal of Positive Behavior Interventions*, 11(1), 35-46.
- Scott, T. M., McIntyre, J., Liaupsin, C., Nelson, C. M., Conroy, M., & Payne, L. (2005). An Examination of the Relation Between Functional Behavior Assessment and Selected Intervention Strategies with School-Based Teams. *Journal of Positive Behavior Interventions*, 7(4), 205-215.
- Short description of research and positive behavior support. *Association for Positive Behavior Support*, retrieved from [www.apbs.org](http://www.apbs.org)
- Sinclair, M. F., Christenson, S. L., Evelo, D. L., & Hurley, C. M. (1998). Dropout prevention for youth with disabilities: Efficacy of a sustained school engagement procedure. *Exceptional Children*, 65(1), 7-21.
- Sinclair, M. F., Christenson, S. L., & Thurlow, M. L. (2005). Promoting school completion of urban secondary youth with emotional or behavioral disabilities. *Exceptional Children*, 71(4), 465-482.
- Stewart, R.M., Benner, G.J., Martella, R.C., Marchand-Martella, N.E. (2007). Three-tier models of reading and behavior: A research review. *Journal of Positive Behavior Interventions* 9, 239-253.
- Sugai, G. & Horner, R. H. (2006). A promising approach for expanding and sustaining school-wide positive behavior support. *School Psychology Review*, 35(2), 245-259.
- Todd, A.W., Campbell, A.L., Meyer, G.G., & Horner, R.H. (2008). The effects of a targeted intervention to reduce problem behaviors: Elementary school implementation of check In-Check Out. *Journal of Positive Behavior Interventions*, 10, 46-55.
- Vaughn, S., & Linan-Thompson, S. (2003). What is special about special education for students with learning disabilities? *The Journal of Special Education*, 37, 140-147.