The Behavior Analyst 2005, 28, 49–63 No. 1 (Spring)

Applying Behavior Analysis to School Violence and Discipline Problems: Schoolwide Positive Behavior Support

Cynthia M. Anderson
West Virginia University

Donald Kincaid
University of South Florida

School discipline is a growing concern in the United States. Educators frequently are faced with discipline problems ranging from infrequent but extreme problems (e.g., shootings) to less severe problems that occur at high frequency (e.g., bullying, insubordination, tardiness, and fighting). Unfortunately, teachers report feeling ill prepared to deal effectively with discipline problems in schools. Further, research suggests that many commonly used strategies, such as suspension, expulsion, and other reactive strategies, are not effective for ameliorating discipline problems and may, in fact, make the situation worse. The principles and technology of behavior analysis have been demonstrated to be extremely effective for decreasing problem behavior and increasing social skills exhibited by school children. Recently, these principles and techniques have been applied at the level of the entire school, in a movement termed *schoolwide positive behavior support.* In this paper we review the tenets of schoolwide positive behavior support, demonstrating the relation between this technology and applied behavior analysis.

Key words: schools, positive behavior support, school discipline, behavior problems

Although homicide and other acts of extreme violence in schools remain relatively rare, schools increasingly are faced with a variety of problems including assault, gang recruitment, weapon use, and bullying (Crowe, 1991; Walker, Colvin, & Ramsey, 1995). To illustrate, in 1998, 7% to 8% of 9th through 12th graders reported being threatened or injured with a gun or other weapon in the past 12 months, and 21% of ninth graders reported being in a fight on school grounds in the past 12 months (Kaufman et al., 2001). Further, 11% of 6th through 10th graders reported being bullied (Nansel et al., 2001). Less severe, but even more prevalent, are behavior problems that disrupt learning and negatively affect school climate (Nelson, 1996; Scott, 2001). Examples of such behaviors include off-task behavior, noncompliance, defiance, disruptive behavior in the classroom, threatening teachers and other students, and drug use. Public Agenda (2004) recently surveyed 725 middle and high school teachers and found that 70% of teachers report disruptive behavior to be a serious concern in their schools and that 85% of new teachers reported being unprepared to manage discipline problems in the classroom. Not surprisingly, most (77%) teachers reported that they would be better able to educate students if discipline problems were not so prevalent; in fact almost 4 in 10 teachers reported that they spend more time managing disruptive behavior then they do teaching. Most teachers reported that schools are adequately preventing and responding to very serious concerns, such as weapons and drug use, but that schools needed to focus far more on less severe but more prevalent discipline problems such as noncompliance, disruption, and so forth.

In response to discipline problems, schools often apply a reactive approach—implementing a consequence after a problem has occurred (Sugai &

Address correspondence to Cynthia Anderson, Deparment of Psychology, West Virginia University, Morgantown, West Virginia 26506 (e-mail: Cindy.Anderson@mail.wvu.edu).

Horner, 2002). Commonly used consequences include verbal reprimand, office referral, detention, suspension, loss of privileges (e.g., recess), and expulsion. As noted by Colvin, Kameenui, and Sugai (1993), the logic behind such consequences seems to be that, ''by experiencing these consequences . . . students will learn the 'right way' of behaving and be motivated sufficiently to comply to expectations of the school'' (p. 364). Although such consequences may result in immediate cessation of the problem (because the student has been removed), they typically do not reduce the likelihood of such problems occurring again in the future (Sprague et al., 2001). In fact, schools may be inadvertently positively reinforcing problem behavior by providing individualized attention (e.g., meetings with the principal, parent conferences, counseling) or negatively reinforcing such behavior by ensuring that escape or avoidance of academics follows such behavior (e.g., in-class time-out, removal from the classroom, suspension). Of course, the reactive behavior of school personnel also is likely reinforced in the short term by the removal a student from a classroom, even though the procedure does not affect the more molar probability that the problematic behavior will occur again.

Because such consequence-based programs often are not effective in reducing problem behavior of students who exhibit severe or repeated discipline violations and in teaching children more appropriate ways to behave, students who continue to exhibit problem behaviors are met with increased sanctions, and often are moved into more and more restrictive and segregated placements (e.g., behavior-disorder classrooms, special schools; Sugai & Horner, 2002). This trend is troubling, because research suggests that students who exhibit discipline problems and are placed in a restrictive setting often begin to exhibit more severe and frequent discipline problems (Dishion & Andrews, 1995). In fact, extreme reactive programs such as ''zero tolerance'' (removing students from a school following the occurrence of a serious discipline problem) and intense security programs may actually increase the incidence and severity of the very problems they are designed to reduce (Hyman & Perone, 1998; Lewis, Sugai, & Garrison-Harrell, 1999; Sprague, Flannery, & Szidon, 1998; Turnbull et al., 2002).

Another common approach is to place ''problem students'' in individual counseling or therapy. Walker (1995) reported that teachers often indicate counseling to be their most preferred method of intervention for classroom discipline problems. Unfortunately, therapeutic techniques typically focus on changing the student's cognition or affect, or on helping the student recognize that such behavior is inappropriate (Metzler, Biglan, Rusby, & Sprague, 2001). Little attention is paid to identifying (and subsequently manipulating) environmental variables that may evoke and maintain such behavior. Although students may verbalize an understanding of the inappropriateness of their actions, unless the consequences that maintain such behavior change, they are taught more appropriate ways to behave, and more appropriate behaviors are reinforced, sustained improvements are unlikely. As would be expected, existing research suggests that simply being able to verbalize that a given behavior is inappropriate and identify possible reasons why such behavior occurs (the desired outcome of most counseling interventions) does not affect the likelihood that targeted behaviors will occur (Dryfoos, 1990).

In recent years, there has been a call for comprehensive school programs to address and prevent discipline problems by several agencies including the U.S. Department of Health and Human Services (2001) and by leading researchers (Dwyer, Osher, & Warger, 1998; Elliot, Hamburg, & Williams, 1998; D. C. Gottfredson, Gottfredson, & Hybl, 1993; G. R. Mayer, 1995).

However, demonstrably effective comprehensive programs that focus on prevention have existed for several decades. For example, early research demonstrated the importance of well-defined and specifically taught rules and expectations (Becker, Madson, Arnold, & Thomas, 1967), delivering consequences for rule following and rule violations (Ayllon & Roberts, 1974; Fishbein & Wasik, 1981; Madsen, Becker, & Thomas, 1968; Murphy, 1983; Ringer, 1973), and explicitly teaching students appropriate behavior. Others have suggested that students should be taught appropriate behavior and that rewards should be contingent on such behavior (Sulzer-Azaroff & Mayer, 1986). What have been missing are systematic and sustained efforts to implement comprehensive prevention programs at the level of the entire school (Sugai & Horner, 2002). Schoolwide positive behavior support (SWPBS) was developed in an attempt to address this gap.

SCHOOLWIDE POSITIVE BEHAVIOR SUPPORT

As noted above, a body of research exists that documents the efficacy of behavioral interventions both for individual students and for groups of students in a school. SWPBS assists schools in both implementing and sustaining such comprehensive, evidence-based practices by incorporating findings from organizational behavior management designed to increase the capacity of an organization to facilitate and maintain systems change (Sugai & Horner, 2002). As described in this section, and as noted by Sugai and Horner, strategies derived from empirical studies in organizational behavior management include gaining and maintaining support from school leaders (i.e., administration), basing decisions on existing data, and using team decision making.

Positive behavior support in a school is implemented at three levels: universal support, targeted support, and individual support (Horner, 2000; Lewis & Sugai, 1999; Lewis et al., 1999). SWPBS is the universal level and the focus of this paper; it provides the framework within which other, more intensive and targeted supports can be implemented. Other levels of positive behavior support in a school include targeted interventions for groups of students at risk for discipline problems or school failure, and individualized interventions for students whose behavior does not respond to universal or targeted interventions (Lewis, Powers, Kelk, & Newcomer, 2002). Review of targeted and individual levels in schools is beyond the scope of this paper (but see J. E. Carr & Sidener, 2002; Horner, 2000; Lewis et al., 1999, 2002).

SWPBS is a comprehensive system of support that is in place in all areas in a school (e.g., hallways, classrooms, cafeteria, schoolyard). The goals of SWPBS are (a) to prevent the development of problem behavior, (b) to decrease or eliminate currently occurring discipline problems, and (c) to increase positive social behavior of all students (Safran & Oswald, 2003; Turnbull et al., 2002; Warren et al., 2003). SWPBS is not a packaged approach; although schools typically progress through similar steps in the development of their program, the specifics of the program likely will vary across schools. For example, all schools develop rules for specific settings (e.g., the cafeteria), but the rules for the cafeteria in one school may be quite different than the rules in another school. Further, rules for different settings will vary within a given school (e.g., expected behaviors are different from classroom to classroom and from academic to nonacademic settings). As gleaned from empirical research on SWPBS as well as from demonstration projects (e.g., Horner, Sugai, Lewis-Palmer, & Todd, 2001; Sprague et al., 2001; Sugai & Horner, 2002; Tobin, Lewis-Palmer, & Sugai, 2002), common features of SWPBS include the following: (a) using a team-driven approach to develop

and sustain systems change in the school; (b) analyzing school data to identify recurring discipline problems and settings in which problems often occur (i.e., a functional assessment); (c) developing expectations and rules based on the results of the functional assessment; (d) designing an incentive program to increase appropriate behavior; (e) developing a continuum of consequences for rule violations; (f) designing and implementing a curriculum to teach students, faculty, and staff the expectations, rules, and reward program; and (g) monitoring school data to evaluate the efficacy and fidelity of the program.

Team-Driven Approach

Schools that choose to implement SWPBS begin by developing a team that is charged with obtaining and maintaining faculty and staff commitment to systems change and designing and implementing the SWPBS program in their school (Todd, Horner, Sugai, & Sprague, 1999). The rational for a team-driven system is that it is difficult if not impossible for an individual to initiate and sustain systems change (Sugai & Horner, 2002). Further, including relevant parties (e.g., regular educators, special educators, administration) increases the likelihood that the resulting plan will be accepted and supported by the school as a whole (G. R. Mayer, 2002). School teams typically consist of three to seven individuals who are representative of the school and should include at least one administrator as administrative support. Reviews of factors associated with school violence suggest that lack of administrative support for policies and initiatives leads to the quick demise of such programs (G. R. Mayer, 1995, 2002; G. R. Mayer, Butterworth, Nafpaktitis, & Sulzer-Azaroff, 1983). In addition to administrative support, teams should include at least one member with behavioral expertise (Tobin et al., 2002) to guide the team toward the use of evidence-based strategies.

Prior to developing and implementing a SWPBS program, teams are encouraged to obtain faculty investment and commitment; if the majority of faculty do not view addressing discipline problems as a priority, they will be unlikely to commit to a comprehensive and systematic program that addresses these problems (Scott, 2001; Warren et al., 2003). A general rule used by the authors and others (e.g., Sugai & Horner, 2002) is that schools should not move forward with implementation of the SWPBS program until at least 80% of faculty indicate that they will participate in and support the program for at least 3 to 4 years. Obtaining and maintaining a commitment to SWPBS may be accomplished in a variety of ways. For example, school teams that work with the authors have obtained commitment by presenting discipline data to the faculty to highlight the need to focus on school discipline (e.g., by reporting the number of office referrals per month). Other schools have reviewed the components of SWPBS with the faculty and staff and presented outcome data from other schools that have implemented SWPBS.

Analyzing School Data

The specifics of a SWPBS program at any school are derived based on the school's data. The school team reviews existing data (typically office discipline referrals and resulting consequences) to identify recurring discipline problems, the settings in which discipline problems occur most often, and frequently implemented consequences for recurring discipline problems (e.g., Skiba, Peterson, & Williams, 1997; Sugai, Sprague, Horner, & Walker, 2000). The school team may also gather data by interviewing faculty and staff; conducting observations in the school; and analyzing standardized test scores, detention, suspension, expulsion, and attendance rates (Sugai & Horner, 2002; Turnbull et al., 2002). Based on the school's data, the specifics of the SWPBS program (e.g., rele-

vant rules and expectations, continuum of consequences for failure to follow rules) are developed. A review of school data may result in alteration of setting events as well. For example, Nelson, Martella, and Galand (1998) altered scheduling to reduce congestion in noninstructional areas such as hallways by posting signs that indicated directions and reduced the time students waited outside the common areas (e.g., cafeteria) prior to entering. Other setting-specific changes that might result from a review of the data include closing the campus, ensuring that visitors sign in and wear badges, providing staff with identification badges, assigning teachers to supervise common areas, providing two-way radios for on-duty teachers, and establishing and disseminating emergency procedures (Schneider, Walker, & Sprague, 2000).

Developing Expectations and Rules Based on the Results of the Functional Assessment

As noted by a number of researchers, student behavior is improved when students know exactly what behavior is acceptable and unacceptable (Dwyer et al., 1998; G. R. Mayer, 1995, 2002; M. J. Mayer & Leone, 1999). Most schools have a large number of rules that, to a greater or lesser extent, are communicated to students and faculty (G. D. Gottfredson et al., 2000); however, rules often are vague and do not specify expected behavior (Colvin et al., 1993; G. R. Mayer, 1995). For example, a rule stating ''no running in the halls'' does not provide information about what students are expected to do in hallways, which likely includes walking, staying to the right, and keeping hands to self.

To ensure that the population of a school (i.e., students, faculty, and staff) knows which behaviors are acceptable and unacceptable, teams develop schoolwide expectations and setting-specific rules (Lewis & Sugai, 1999; Sugai & Horner, 2002). Schoolwide expectations are broad statements of expected behaviors. School teams develop three to five positively worded statements (e.g., be respectful, be safe, be responsible) that are used to derive setting-specific rules. Rules are developed for those settings in which problem behavior frequently occurs. Common settings include hallways, cafeterias, and the schoolyard. For example, if school data revealed many discipline problems in the cafeteria and that common problems included pushing, cutting in line, throwing food, and leaving trash on the table, rules would be developed to address those problems. School teams often use guidelines articulated by G. R. Mayer (1999) to facilitate adoption of rules; these include operationally defining expected behavior, stating rules positively, and keeping rule statements simple and the number of rules short. Table 1 provides an example of operationally defined rules derived from schoolwide expectations.

Designing an Incentive Program to Increase Appropriate Behavior

The behavior-analytic literature is replete with empirical studies that have documented the importance of differentially reinforcing appropriate behavior (E. G. Carr & Durand, 1985; Dixon, Benedict, & Larson, 2001; Vollmer & Iwata, 1992). Unfortunately, research suggests that although schools often are quick to implement consequences for problem behavior that are intended to be punitive (e.g., reprimands, suspension, office referrals, counseling, detention), the systematic use of rewards is far less common (G. D. Gottfredson et al., 2000). In fact, schools spend more time implementing punitive consequences than incentive programs (Skiba et al., 1997). To increase the focus on positive social behavior and to ensure that such behavior is responded to systematically, school teams develop a schoolwide reward system (Sugai & Horner, 2002; Turnbull et al., 2002). Because the reward system should be applicable in all set-

TABLE 1

Sample expectations and rules for relevant settings in a school

	Hallways	Cafeteria	Playground
Be safe	Walk on the right side. Keep hands, feet, and objects to yourself.	Keep food and drink off the floor. Sit only on table benches.	Use equipment as instructed.
Be prepared	Be at your next class when the bell rings.	Have lunch money ready. Know what you want to order when it is your turn.	Be on time to recess and lined up to leave when instructed to do so. Be ready to repeat instructions when asked.
Be respectful	Use inside voice. Put trash in garbage cans.	Keep hands and feet to self. Take your place in line.	Stop and listen when the whistle blows. Take your place in line. Wait your turn for equipment. Follow game rules.

tings and should incorporate rewards likely to function as reinforcers for all students, token economies often are used (e.g., Metzler et al., 2001; Nelson et al., 1998; Turnbull et al.). For example, Turnbull et al. implemented SWPBS in an inner-city middle school and used a ticket reward system. Tickets listed school expectations and had blank spaces for teachers to fill in the student's name. Teachers circled the expectation the student met, and the ticket was placed in a box in the main office. Each morning an administrator pulled a ticket from each box (one box for each grade) and used the public address system to identify the student and the expectation that student had met, and then asked that student to come to the office. Students then were able to select a prize from a menu of options.

In addition to token economies, schools often implement systems to increase general recognition of appropriate behavior. In this vein, Metzler et al. (2002) implemented a ''good news'' referral system. Using this program, teachers sent positive referrals to administrators for ''exceptionally noteworthy'' behavior such as taking on a leadership role in the classroom or substantive improvements in work habits. Parents of children who received ''good news'' referrals were telephoned and informed of their child's exemplary behavior.

Developing a Continuum of Consequences for Rule Violations

Consequences also are developed for rule violations. Although school districts typically mandate consequences for severe discipline problems such as weapons violations, educators often implement a variety of contingencies for less severe infractions, often with little guidance from empirical research (G. R. Mayer, 2002). Thus, an important component of SWPBS is for teams to develop a systematic and consistent approach to rule violations. To this end, teams operationally define problem behavior so that everyone in the school knows exactly what will and will not be tolerated (Sugai & Horner, 2002). This limits the use of vague labels (and hence inconsistency in the use of consequences). For example, the first author worked with one school that had targeted ''disrespect'' as a problem behavior prior to the implementation of SWPBS. Querying teachers and staff revealed many different

definitions of disrespect—some teachers reported that it involved behaviors such as swearing, pushing, or knocking over furniture; others reported that behaviors such as eye rolling, sighing in a dramatic way, and crossing the arms over the chest constituted disrespect. Clearly identifying problem behaviors thus becomes a major issue for developing data-based decision making.

After discipline problems are defined operationally, procedures for responding to rule violations are organized along a continuum of intensity (Sugai & Horner, 2002). Prior to implementing SWPBS in the above-mentioned school, some teachers responded to noncompliance by sending the student to the office, others responded by keeping the student after class or assigning extra homework, and still others simply ignored the behavior. These inconsistent discipline strategies make it difficult or impossible to evaluate the effects of a discipline program and may actually exacerbate discipline problems (G. R. Mayer, 1995). To develop consistent and effective consequences, teams consider existing data to identify probable functions of problem behavior and to match consequences to the severity of the rule violation. For example, suspending a student who is tardy does not match the function of the behavior, which likely is to avoid school. Similarly, placing a child in detention for 2 weeks following the first instance of yelling in the cafeteria does not match the severity of the behavior.

Designing and Implementing a Curriculum

After the team has developed rules and expectations and designed a reward program, they turn their attention to designing and implementing a curriculum to teach the program to the entire school body (Taylor-Greene et al., 1997). The curriculum is developed based on research on behavioral skills training and includes the following components: (a) overview of each expectation and rule, including a rationale for acquiring the skill (students often are asked to generate a rationale during the teaching session); (b) description of the setting in which the rule should be followed (typically the setting in which training occurs); (c) examples and nonexamples of rule following and expected behavior; (d) opportunities for students to practice exhibiting the wrong behavior and the right behavior; (e) feedback for rehearsals and reinforcers for correct performance; and (f) public recognition of students who meet predetermined criteria for demonstrating an expectation or rule.

Training is conducted when the program is initially implemented and again periodically throughout the year (e.g., after winter break) to enhance rule following and positive social behavior (Taylor-Greene et al., 1997). Training is provided by teachers and other educators and occurs in the setting for which rules are being taught. To further enhance learning, teams post expectations throughout the school and setting-specific rules in all targeted locations.

Monitoring School Data to Evaluate the Efficacy and Fidelity of the SWPBS Program

Perhaps the most critical component of SWPBS is the last; evaluating data to ensure fidelity of implementation and make adjustments as needed. Although a variety of programs designed to address discipline problems in schools exist, little emphasis is placed on assisting schools in sustaining systems change; SWPBS (or any prevention program) is unlikely to have a significant impact if it is not maintained over time (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Sprague & Walker, 2002; Sugai, Sprague, Horner, & Walker, 2000). To this end, schools that implement SWPBS develop strategies for ongoing data-based decision making and invest in training and sup-

port for teachers and staff (Sugai & Horner, 2002).

Teams that implement SWPBS develop a system to ensure that school data are frequently evaluated (e.g., biweekly) and are used to guide decision making (Sugai & Horner, 2002). For example, a team might find that few tokens are being delivered in hallways. Therefore, a system is implemented to increase teachers' use of rewards in the halls (e.g., by discussing the importance of this at the next faculty meeting or by giving teachers reward slips designed exclusively for hallways). To increase the likelihood that data are used to guide decision making and that the data collected are reliable and valid, Sugai and Horner suggest the following: (a) ensure that rule violations are clearly defined and that steps for processing office discipline referrals are efficient; (b) develop a procedure for storing, analyzing, and summarizing data; and (c) embed structured occasions for review of data to facilitate data-based decision making.

A key feature for achieving and maintaining positive outcomes with SWPBS is sustained commitment to the approach (G. R. Mayer, 2002; Tobin et al., 2002) and ensuring that the plan is implemented with fidelity. As described earlier, three critical components for increasing the likelihood that the plan will be implemented with fidelity are (a) developing faculty commitment, (b) gaining the support and leadership of the administration, and (c) training staff to ensure that they are familiar with and able to implement the program. After implementation begins, teams actively promote the SWPBS program through strategies such as presenting school data in faculty meetings (to demonstrate the effects of the program) and ensuring that rules and expectations are posted throughout the school. Following G. R. Mayer's (1995) recommendations for constructive discipline, SWPBS teams also develop support and incentive programs for teachers to increase compliance with the SWPBS program. For example, teams might highlight faculty who implement the program well in a newsletter, or the school principal might send thank-you notes to teachers congratulating them on contributing to a safe school. Efforts to build a strong team and build and maintain investment and commitment in the SWPBS program are important, because research suggests that, in the absence of a consensus on goals, strong leadership, and open communication about discipline problems, sustained systems change is unlikely (G. D. Gottfredson, Jones, & Gore, 2002).

SWPBS AND BEHAVIOR ANALYSIS

In 1968 and again in 1987, Baer, Wolf, and Risley identified seven features of applied behavior-analytic research and practice. Behavior analysis is applied, behavioral, analytic, conceptual, technological, effective, and displays generality. Here we discuss the components of positive behavior support in the context of those features to demonstrate that SWPBS is an application of behavior analysis.

Applied and Behavioral

Applied research and practice address significant human concerns. It would be difficult to argue that addressing school discipline and academic outcomes is not important to our society. Working at the level of entire schools, behavior analysis has the potential to affect entire communities. Indeed, in some areas SWPBS is implemented at the level of entire school districts or even the entire state, thus affecting even larger systems (Nersesian, Todd, Lehmann, & Watson, 2000; Sadler, 2000).

Baer et al. (1968, 1987) note that a distinguishing feature of applied behavior analysis is documentation that it was the participant's behavior that changed rather than some indirect measure of change (such as changes on a standardized test). In SWPBS, the primary measure of the effects of SWPBS

is the office discipline referral (Sugai, Sprague, et al., 2000). These referrals are a written record of a rule violation that documents, at minimum, the student, the rule violation, and the staff member documenting the offense. There are advantages and limitations to using referrals as a measure of efficacy of SWPBS. Obvious advantages are that they are collected almost universally in schools and thus are an easily accessible and convenient measure of student behavior. Although one might criticize discipline referrals as an indirect measure of student behavior (because they are not collected by a behavior analyst observing the response), this is not a valid criticism; the referrals are a measure of a teacher's direct observation of a target behavior. Hence, referrals are a measure of the teacher response and the student behavior. Of course, the reliability and validity of referrals as a measure of the effectiveness of SWPBS must be established; in an initial attempt to do so, Irvin, Tobin, Sprague, Sugai, and Vincent (2004) reviewed a sample of published studies using discipline referrals and found that empirical support exists for their use as a measure of the overall climate of a school. For example, published studies demonstrate strong correlations between referrals and other indicators of student problem behavior, including various measures of discipline problems (e.g., interviews with teachers, students, review of records, direct observation) and academic achievement. As reviewed by Irvin et al., several studies have demonstrated that discipline referrals are sensitive to the effects of schoolwide interventions. For example, Nelson (1996) reported good reliability between referrals and direct observation in a school that implemented SWPBS. Colvin et al. (1993) evaluated SWPBS by comparing referrals from two matched schools, one receiving SWPBS and the other receiving no intervention (the control school) and found substantive decreases in referrals in the experimental school and slight increases in referrals in the control school.

Analytic and Conceptual

The analytic component of behavior analysis requires a clear demonstration that observed changes in behavior are due to the intervention and not some other variable. As noted by Baer et al. (1987), an intervention is considered analytic ''only when it [behavior analysis] demonstrates convincingly how to make specified changes and when its behavior-change methods make systematic, conceptual sense'' (p. 318). As illustrated in the previous section, SWPBS involves the application of behavior principles and procedures (derived from the field of organizational behavior management as well as research on the assessment and treatment of problem behavior) to entire school systems. The conceptual link between the philosophy of behavior analysis and the implementation of SWPBS is clear as well. First, SWPBS emphasizes data-based (i.e., a functional assessment) assessment and decision making. Second, interventions are idiographically implemented (designed for a specific school rather than an individual—the typical focus of behavior-analytic interventions). Third, intervention components (e.g., differential reinforcement, token economy, explicit teaching of expected behaviors) are derived directly from research in the field of behavior analysis.

Behavior analysis also requires a clear demonstration that a change in behavior is due to the intervention and not to some other factor. Traditional single-subject designs are difficult to implement at the level of the school system for a number of reasons, including ethical concerns that might arise from removing the intervention once it is implemented (not to mention the difficulty of doing so) and the multicomponent nature of the intervention (which makes it impossible to tell which features are responsible for behavior change). The majority of pub-

lished studies on SWPBS used an AB design to evaluate the effects of SWPBS. For example, Tobin et al. (2002) used AB designs to evaluate the effects of SWPBS in five schools simultaneously and reported baseline-to-treatment reductions in office discipline referrals of greater than 85% in four of the five schools. As another example, Nelson et al. (1998) used an AB time series design to evaluate the effects of SWPBS in an elementary school and found significant reductions in office discipline referrals following implementation of SWPBS. Although AB designs do not rule out the possibility that variables other than the intervention affect the dependent variable, they provide some evidence of the effects of the intervention, especially when data are collected for extended periods of time, as is common in most studies of SWPBS. To illustrate, Tobin et al. collected data for 3 years, and Nelson et al. collected data for 4 years.

Increasingly, researchers are using control-group designs to evaluate the effects of SWPBS (Metzler et al., 2001; Nelson, Martella, & Marchand-Martella, 2002; Sprague et al., 2001). For example, Sprague et al. compared outcomes achieved in nine schools that implemented SWPBS to outcomes from six control schools and reported statistically significant reductions in the number of discipline referrals in all treatment schools. In this study, the average reduction in discipline referrals at participating elementary schools was 51%; the average reduction observed at the comparison elementary schools was 8%. Middle schools that received the intervention reported a 36% decrease in office referrals, whereas discipline referrals at the control middle schools actually increased 82%.

Although group designs are not commonly used in behavior-analytic research, a number of researchers (Crosbie, 1999; Davison, 1999) have argued that group designs have a place in behavior analysis; indeed, such designs are appearing with increasing frequency in the *Journal of the Experimental Analysis of Behavior* and the *Journal of Organizational Behavior Management*. As noted by Shull (1999), it is ''very foolish to ignore an interesting, well-conceived, and well-carried-out study simply because it was conducted under a group-based design'' (p. 118). Group designs do not allow for precise manipulation of the independent variable and for a statement of causal functional relations but, in the case of SWPBS, they provide convincing evidence that schools that implement SWPBS achieve and maintain significant changes.

Technological

Technological precision—precise specification of the details of an intervention—is a defining feature of behavior analysis. In the case of SWPBS, technological precision relates to the extent to which implementers strive for precision (i.e., implementation fidelity) in individual schools. A variety of strategies are built into the SWPBS implementation procedure to enhance fidelity. As delineated by Sugai and Horner (2002), commonly used strategies include (a) team-based leadership; (b) ensuring that at least 80% of faculty and staff approve of and agree to implement the SWPBS plan; (c) visible and strong support and leadership from administration; (d) teaching faculty and staff to implement the SWPBS plan with demonstrable accuracy and fluency; (e) providing scripts, cues, and other aids to assist in implementation; (f) repeated training and professional development opportunities; (g) ensuring that a reinforcement system is in place for staff implementation; and (h) monitoring data to evaluate fidelity.

Effective

In addressing the still-current dimensions of applied behavior analysis, Baer et al. (1987) suggest several directions for behavior analysis and note,

The behavior classes called delinquency, substance abuse, safety, exercise, and diet, for ex-

ample, represent complex classes of topographies serving complex functions involving many agents of reinforcement/punishment and stimulus control, all of whom [sic] interact to constitute and maintain the system as such. Thus, entry at just one point of such systems is likely to yield only limited, short-term behavior changes. (p. 323)

They go on to suggest three remedies to this problem: systems-level analysis, systemwide intervention, and a recognition that some problems will require a long-term intervention rather than a single, rapid fix. As reviewed in this paper, SWPBS is an application of the theory and practice of behavior analysis to systems-level analysis and change; SWPBS is applied in a manner such that it will be durable and maintained over time. Thus, SWPBS clearly meets Baer et al.'s suggestions for increasing the applicability and utility of behavior analysis.

Currently there are a large number of schools implementing SWPBS. For example, over 150 schools in Florida are implementing SWPBS. Horner and his colleagues at the University of Oregon are coordinating the implementation of SWPBS at over 1,000 schools across the country (Sugai & Horner, 2002). Empirical demonstrations of the efficacy of SWPBS are growing as well. As noted previously, the majority of published studies are case studies conducted in one or two schools, yet an increasing number of empirical studies exist (for a review, see Safran & Oswald, 2003). In an effort to assess outcomes achieved via SWPBS experimentally, Sugai, Horner, and colleagues are conducting a 5-year study with 90 schools across the country designed to evaluate the effectiveness, efficiency, durability, and relevance of schoolwide behavior support.

Display Generality

To date, SWPBS has been implemented in a variety of types of schools, including elementary schools (Lewis et al., 2002; Todd, Haugen, Anderson, & Spriggs, 2002), middle and high schools (Colvin et al., 1993; Kartub, Taylor-Greene, March, & Horner, 2000; Turnbull et al., 2002), and magnet schools. In addition, SWPBS has been implemented in rural settings (Kartub et al.) as well as in urban schools (Netzel & Eber, 2003; Turnbull et al.; Warren et al., 2003). Studies have documented the durability of results across several years (Nelson et al., 1998; Tobin et al., 2002). The generality of SWPBS should not come as a surprise to the reader, because SWPBS involves well-tested principles of behavior analysis. Of course, more data supporting the generality and utility of SWPBS—across settings and across time—are needed.

CONCLUDING COMMENTS

School discipline is a growing concern in the United States. Teachers increasingly are faced with discipline problems that not only may endanger other students, the teacher, and the student him- or herself, but also disrupt the learning of all students. The principles and techniques of behavior analysis, demonstrably effective at ameliorating problem behavior and increasing positive social behavior in individual students, recently have been applied to entire schools via SWPBS. SWPBS meets the criteria for applied behavior analysis that were identified by Baer et al. (1968). Specifically, SWPBS is applied, behavioral, analytic, conceptual, technological, effective, and displays generality.

Several behavior analysts (Hopkins, 1987; Kunkel, 1987) have noted that applied behavior analysts have focused most of their efforts on limited populations (e.g., individuals with developmental disabilities or severe psychiatric illness) and have worked in restricted settings (e.g., institutions). There exist only a few examples of behavior-analytic technologies successfully applied to a wider range of problems and settings. We believe that this is unfortunate, given the power of behavioral technology and the extent to which this technology could be used to effect

broad and meaningful changes in the lives of others. SWPBS exemplifies the application of behavior-analytic principles and technology to a nonclinical population in a comprehensive and systematic way.

Perhaps one reason that behavior-analytic research has thus far not extensively addressed such populations and settings is that doing so (working in relatively uncontrolled settings as schools) will necessitate less reliance on rigorous methodology than typifies much of applied behavior-analytic research (see any recent issue of the *Journal of Applied Behavior Analysis*). To be sure, demonstrations of causal relations and internal validity demand controlled settings and systematic manipulation of variables (and thus should remain an integral part of applied behavior analysis). However, applied behavior analysis must also focus on issues of external or ecological validity—the extent to which its methods and interventions are useful in real-world settings (Dunlap, Fox, Vaughn, Bucy, & Clarke, 1997). If behavior analysts hope to demonstrate not only the internal validity of behavioral technology but also its utility (ecological validity), greater flexibility with regard to experimental designs will be required. In the case of SWPBS, reversal designs and alternating treatment designs usually are not feasible. Although a multiple baseline design across schools may be an option, it likely would have to be a nonconcurrent multiple baseline—a weak design at best. Demonstrations of efficacy might thus require some reliance on group designs. Such designs historically have been largely avoided by behavior analysts, at least in part because they are not useful for isolating causal mechanisms. If the goal, however, is to demonstrate that a given technology (i.e., SWPBS)—one that uses principles with demonstrable internal validity—results in meaningful and lasting change, then such designs may be acceptable. As noted by E. G. Carr et al. (2002),

> As we move our research from more controlled settings such as laboratories, clinics, and institutional settings to less controlled situations such as community-based schools, homes, and job sites, it becomes apparent that both pragmatic and validity concerns demand flexibility in scientific practices. (p. 10)

REFERENCES

Ayllon, T., & Roberts, M. D. (1974). Eliminating discipline problems by strengthening academic performance. *Journal of Applied Behavior Analysis, 7,* 71–76.

Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 1,* 91–97.

Baer, D. M., Wolf, M. M., & Risley, T. R. (1987). Some still-current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 20,* 313–327.

Becker, W. C., Madson, C. H., Jr., Arnold, C. R., & Thomas, D. R. (1967). The contingent use of teacher attention and praise in reducing classroom behavior problems. *Journal of Special Education,* 287–307.

Carr, E. G., Dunlap, G., Horner, R. H., Koegel, R. L., Turnbull, A. P., Sailor, W., et al. (2002). Positive behavior support: Evolution of an applied science. *Journal of Positive Behavior Interventions, 4,* 4–16.

Carr, E. G., & Durand, V. M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis, 18,* 111–126.

Carr, J. E., & Sidener, T. M. (2002). On the relation between applied behavior analysis and positive behavioral support. *The Behavior Analyst, 25,* 245–253.

Colvin, G., Kameenui, E. J., & Sugai, G. (1993). Reconceptualizing behavior management and school-wide discipline in general education. *Education and Treatment of Children, 16*(4), 361–381.

Crosbie, J. (1999). Statistical inference in behavior analysis: Useful friend. *The Behavior Analyst, 22,* 105–108.

Crowe, T. (1991). *Habitual juvenile offenders: Guidelines for citizen action and public responses.* Washington, DC: Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.

Davison, M. (1999). Statistical inference in behavior analysis: Having my cake and eating it? *The Behavior Analyst, 22,* 99–103.

Dishion, T., & Andrews, D. (1995). Preventing escalation in problem behaviors with high-risk, young adolescents: Immediate and one-year outcomes. *Journal of Consulting and Clinical Psychology, 63,* 1–11.

Dixon, M. R., Benedict, H., & Larson, T. (2001). Functional analysis and treatment of

inappropriate verbal behavior. *Journal of Applied Behavior Analysis, 34,* 361–363.
Dryfoos, J. (1990). *Adolescents at risk*. New York: Oxford University Press.
Dunlap, G., Fox, L., Vaughn, B. J., Bucy, M., & Clarke, S. (1997). In quest of meaningful perspectives and outcomes: A response to five commentaries. *Journal of the Association for Persons with Severe Handicaps, 22,* 221–223.
Dwyer, K. P., Osher, D., & Warger, W. (1998). *Early warning, timely response: A guide to safe schools*. Washington, DC: U.S. Department of Education.
Elliot, D. S., Hamburg, B. A., & Williams, K. R. (1998). *Violence in American schools: A new perspective*. Cambridge: Cambridge University Press.
Fishbein, J. E., & Wasik, B. H. (1981). Effect of the good behavior game on disruptive library behavior. *Journal of Applied Behavior Analysis, 14,* 89–93.
Gottfredson, D. C., Gottfredson, G. D., & Hybl, L. G. (1993). Managing adolescent behavior: A multiyear, multischool study. *American Educational Research Journal, 30,* 179–215.
Gottfredson, G. D., Gottfredson, D. C., Czeh, D. C., Cantor, D., Crosse, S. B., & Hantman, I. (2000). *National study of delinquency prevention in schools*. Ellicott City, MD: Gottfredson Associates.
Gottfredson, G. D., Jones, E. M., & Gore, T. W. (2002). Implementation and evaluation of a cognitive-behavioral intervention to prevent problem behavior in a disorganized school. *Prevention Science, 3,* 43–56.
Hawkins, J. D., Catalano, R. F., Kosterman, R., Abbott, R., & Hill, K. G. (1999). Preventing adolescent health-risk behaviors by strengthening protection during childhood. *Archives of Pediatric and Adolescent Medicine, 153,* 226–234.
Hopkins, B. L. (1987). Comments on the future of applied behavior analysis. *Journal of Applied Behaivor Analysis, 20,* 339–346.
Horner, R. H. (2000). Positive behavior supports. *Focus on Autism and Other Developmental Disabilities, 15,* 97–105.
Horner, R. H., Sugai, G., Lewis-Palmer, T., & Todd, A. W. (2001). Teaching schoolwide behavioral expectations. *Reports on Emotional and Behavioral Disorders in Youth, 1,* 77–79.
Hyman, J. A., & Perone, D. C. (1998). The other side of school violence: Educator policies and practices that may contribute to student misbehavior. *Journal of School Psychology, 36,* 7–27.
Irvin, L. K., Tobin, T. J., Sprague, J. R., Sugai, G., & Vincent, C. G. (2004). Validity of office discipline referral measures as indices of school-wide behavioral status and effects of school-wide behavioral interventions. *Journal of Positive Behavior Interventions, 6,* 131–147.
Kartub, D. T., Taylor-Greene, S., March, R. E., & Horner, R. H. (2000). Reducing hallway noise: A systems approach. *Journal of Positive Behavior Interventions, 2,* 179–182.
Kaufman, P., Chen, X., Choy, S. P., Ruddy, S. A., Miller, A. K., Fleury, J. K., et al. (2001). *Indicators of school crime and safety* (No. NCES 2001-017/NCJ-184176017/NCJ-184176). Washington, DC: U.S. Departments of Education and Justice.
Kunkel, J. H. (1987). The future of *JABA*: A comment. *Journal of Applied Behavior Analysis, 20,* 329–333.
Lewis, T. J., Powers, L. J., Kelk, M. J., & Newcomer, L. L. (2002). Reducing problem behaviors on the playground: An investigation of the application of schoolwide positive behavior supports. *Psychology in the Schools, 39,* 181–190.
Lewis, T. J., & Sugai, G. (1999). Effective behavior support: A systems approach to proactive school-wide management. *Focus on Exceptional Children, 31,* 1–24.
Lewis, T. J., Sugai, G., & Garrison-Harrell, T. (1999). Effective behavior support: Designing setting-specific interventions. *Effective School Practices, 17,* 38–46.
Madsen, C. H., Jr., Becker, W. C., & Thomas, D. R. (1968). Rules, praise, and ignoring: Elements of elementary classroom control. *Journal of Applied Behavior Analysis, 1,* 139–150.
Mayer, G. R. (1995). Preventing antisocial behavior in the schools. *Journal of Applied Behavior Analysis, 28,* 467–478.
Mayer, G. R. (1999). Constructive discipline for school personnel. *Education and Treatment of Children, 22,* 36–54.
Mayer, G. R. (2002). Behavioral strategies to reduce school violence. *Child and Family Behavior Therapy, 24,* 83–100.
Mayer, G. R., Butterworth, T., Nafpaktitis, M., & Sulzer-Azaroff, B. (1983). Preventing school vandalism and improving discipline: A three-year study. *Journal of Applied Behavior Analysis, 16,* 355–369.
Mayer, M. J., & Leone, P. E. (1999). A structural analysis of school violence and disruption: Implications for creating safer schools. *Education and Treatment of Children, 22,* 333–356.
Metzler, C. W., Biglan, A., Rusby, J. C., & Sprague, J. R. (2001). Evaluation of a comprehensive behavior management program to improve school-wide positive behavior support. *Education and Treatment of Children, 24,* 448–479.
Murphy, H. A. (1983). Behavioral school psychology goes outdoors: The effect of organized games on playground aggression. *Journal of Applied Behavior Analysis, 16,* 29–35.
Nansel, T. R., Overpeck, M., Pilla, R. S., Ruan, W. J., Simons-Morton, B., & Scheidt, P. (2001). Bullying behaviors among U.S. youth: Prevalence and association with psychosocial adjustment. *Journal of the American Medical Association, 285,* 2094–2100.

Nelson, J. R. (1996). Designing schools to meet the needs of students who exhibit disruptive behavior. *Journal of Emotional and Behavioral Disorders, 4,* 147–161.

Nelson, J. R., Martella, R. C., & Galand, B. (1998). The effects of teaching school expectations and establishing a consistent consequence on formal office disciplinary actions. *Journal of Emotional and Behavioral Disorders, 6* (3), 153–163.

Nelson, J. R., Martella, R. M., & Marchand-Martella, N. E. (2002). Maximizing student learning: The effects of a comprehensive school-based program for preventing problem behaviors. *Journal of Emotional and Behavioral Disorders, 10,* 136–149.

Nersesian, M., Todd, A. W., Lehmann, J., & Watson, J. (2000). School-wide behavior support through district level system change. *Journal of Positive Behavior Interventions, 2,* 244–247.

Netzel, D. M., & Eber, L. (2003). Shifting from reactive to proactive discipline in an urban school district. *Journal of Positive Behavior Interventions, 5,* 71–79.

Public Agenda. (2004). *Teaching interrupted: Do discipline policies in today's public schools foster the common good?* Retrieved November 13, 2004, from www.publicagenda.org

Ringer, V. M. (1973). The use of a ''token helper'' in the management of classroom behavior problems and in teacher training. *Journal of Applied Behavior Analysis, 6,* 671–677.

Sadler, C. (2000). Effective behavior support implementation at the district level: Tigard-Tualatin School District. *Journal of Positive Behavior Interventions, 2,* 241–243.

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

Schneider, T., Walker, H., & Sprague, J. (2000). *Safe school design: A handbook for educational leaders*. Retrieved October 1, 2003

Scott, T. M. (2001). A schoolwide example of positive behavioral support. *Journal of Positive Behavior Interventions, 3,* 88–94.

Shull, R. L. (1999). Statistical inference in behavior analysis: Discussant's remarks. *The Behavior Analyst, 22,* 117–121.

Skiba, E. A., Peterson, R. L., & Williams, T. (1997). Office referrals and suspension: Disciplinary intervention in middle schools. *Education and Treatment of Children, 20,* 295–313.

Sprague, J., Flannery, B., & Szidon, K. (1998). Functional analysis and treatment of mealtime problem behavior for a person with developmental disabilities. *Journal of Behavioral Education, 8,* 381–392.

Sprague, J., & Walker, H. (2002). *Creating schoolwide prvention and intervention strategies*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.

Sprague, J., Walker, H., Golly, A., White, K., Myers, D. R., & Shannon, T. (2001). Translating research into effective practice: The effects of a universal staff and student intervention on indicators of discipline and school safety. *Education and Treatment of Children, 24,* 495–511.

Sugai, G., & Horner, R. (2002). The evolution of discipline practices: School-wide positive behavior supports. *Child and Family Behavior Therapy, 24,* 23–50.

Sugai, G., Horner, R. H., Dunlap, G., Hieneman, M., Lewis, T. J., Nelson, C. M., et al. (2000). Applying positive behavior support and functional behavioral assessment in schools. *Journal of Positive Behavior Interventions, 2,* 131–143.

Sugai, G., Sprague, J. R., Horner, R. H., & Walker, H. M. (2000). Preventing school violence: The use of office discipline referrals to assess and monitor school-wide discipline interventions. In H. M. Walker & M. H. Epstein (Eds.), *Making schools safer and violence free: Critical issues, solutions, and recommended practices* (pp. 50–57). Austin, TX: Pro-Ed.

Sulzer-Azaroff, B., & Mayer, G. R. (1986). *Achieving educational excellence: Using behavioral strategies*. New York: Holt, Rinehart, and Winston.

Taylor-Greene, S., Brown, D., Nelson, L., Longton, J., Gassman, T., Cohen, J. S., et al. (1997). School-wide positive behavior support: Starting the year off right. *Journal of Behavioral Education, 7,* 99–112.

Tobin, T. J., Lewis-Palmer, T., & Sugai, G. (2002). School-wide and individualized effective behavior support: An explanation and an example. *The Behavior Analyst Today, 3,* 51–75.

Todd, A., Haugen, L., Anderson, K., & Spriggs, M. (2002). Teaching recess: Low-cost efforts producing effective results. *Journal of Positive Behavior Interventions, 4,* 46–52.

Todd, A. W., Horner, R. H., Sugai, G., & Sprague, J. R. (1999). Effective behavior support: Strengthening school-wide systems through a team-based approach. *Effective School Practices, 17,* 23–37.

Turnbull, A., Edmonson, H., Griggs, P., Wickham, D., Sailor, W., Freeman, R., et al. (2002). A blueprint for schoolwide positive behavior support: Implementation of three components. *Exceptional Children, 68,* 377–402.

U.S. Department of Health and Human Services. (2001). *Youth violence: A report of the surgeon general*. Washington, DC: Office of the Surgeon General.

Vollmer, T. R., & Iwata, B. A. (1992). Differential reinforcement as treatment for behavior disorders: Procedural and functional

variations. *Research in Developmental Disabilities, 13,* 393–417.

Walker, H. (1995). *The acting-out child: Coping with noncompliance in the classroom: A positive approach for teachers.* Austin, TX: Pro-Ed.

Walker, H. M., Colvin, G., & Ramsey, E. (1995). *Antisocial behavior in school: Strategies and best practices.* Pacific Grove, CA: Brooks/Cole.

Warren, J., Edmonson, H., Griggs, P., Lassen, S., McCart, A., Turnbull, A., et al. (2003). Urban applications of school-wide positive behavior support. *Journal of Positive Behavior Interventions, 5,* 80–91.