

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/232596152>

# Evaluation of a comprehensive behavior management program to improve school-wide positive behavior support

Article in *Education and Treatment of Children* · November 2001

CITATIONS

147

READS

1,376

4 authors, including:



[Anthony Biglan](#)

Oregon Research Institute

198 PUBLICATIONS 12,051 CITATIONS

[SEE PROFILE](#)



[Jeffrey R. Sprague](#)

University of Oregon

72 PUBLICATIONS 3,623 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



social determinants of health [View project](#)



Positive Behavior Supports in Juvenile Justice [View project](#)

## **Evaluation of a Comprehensive Behavior Management Program to Improve School-Wide Positive Behavior Support**

Carol W. Metzler, Anthony Biglan, Julie C. Rusby  
Oregon Research Institute  
and  
Jeffrey R. Sprague  
University of Oregon

### **Abstract**

This paper describes the evaluation of a consultative approach to assisting middle schools in implementing empirically based school-wide behavior management practices. The Effective Behavior Support program involved working with school staff to clarify rules, teach appropriate social behavior, increase positive reinforcement for positive behavior, consistently provide mild consequences for rule violation, and monitor data on student behavior. The intervention was evaluated through records of rewards given, discipline referrals, and frequent surveys of students. Where possible, data from the target school were evaluated against data from comparison schools. Results showed effects at the target school on increased positive reinforcement for appropriate social behavior and on decreased aggressive social behavior among students. Discipline referrals were significantly decreased for 7<sup>th</sup> graders and for harassment among males. Students' perceptions of school safety improved at the target school but not at comparison schools. Students' reports of being physically or verbally attacked the previous day were reduced at the target school as well, but these changes were also seen at the comparison school.

★ ★ ★

The development of effective methods for promoting appropriate social behavior and preventing aggressive behavior in school settings is an

---

Correspondence concerning this article should be sent to Carol W. Metzler, Oregon Research Institute, 1715 Franklin Blvd., Eugene, OR, 97403. Electronic communication may be sent to [carolm@ori.org](mailto:carolm@ori.org).

This research was supported by grant DA09306 from the National Institute on Drug Abuse to Oregon Research Institute, grant #96-019 from the State of Oregon, Edward Byrne Memorial Grant Program, administered by the Criminal Justice Services Division of the Oregon State Police to the University of Oregon, and grant #97-JN-FX-0022 from the U.S. Department of Justice to the University of Oregon. The authors express their gratitude to the dedicated administrators and staff at Lincoln Middle School in Cottage Grove, Oregon for their cooperation and collaboration in the intervention and assessment activities, and to the administrators and staff at our comparison schools for their cooperation with ongoing assessments. In particular, we would like to recognize Mr. Randy Bernstein at Lincoln Middle School for the indispensable role he played in making this project happen.

important national priority. Recent shootings in schools, coupled with evidence that violent and lethal behavior has increased among adolescents (Elliott, 1994), have aroused considerable concern that schools be assisted in handling aggressive behavior (Mayer, 1995; Sprague, Sugai, & Walker, 1998). To this end, the present paper describes the evaluation of a program to improve behavior management practices in a middle school.

Antisocial behavior, youth violence, and safety are leading concerns in American schools. Despite the fact that overall violent crime has remained relatively stable over the past 15 to 20 years (Furlong, 1994; Roth, 1994), violent juvenile crime continues to increase dramatically. For example, violent crimes among juveniles increased by 41 percent from 1982 to 1991. During this same period, the number of arrests for murder and aggravated assault committed by juveniles increased by 93% and 72% respectively (Wilson & Howell, 1993). These trends may well continue unless they can be offset through a coordinated plan of prevention, early intervention, and graduated sanctions (Walker, Irvin, & Sprague, 1997).

Lately we have seen a spillover of violence and aggression into school settings that were once relatively safe. Recent reviews of aggression in schools indicate that threats and bullying, robbery, assaults on students and teachers, gang recruitment, and injury or death by weapons are escalating concerns at many schools (Committee for Children, 1996; Crowe, 1991; National School Safety Center, 1996; Howell, 1995; Walker, Colvin, & Ramsey, 1995). Reports of the 1999 fatal shootings at Columbine High School in Littleton, Colorado, have underscored the potential pathogenic effects on both victim and perpetrator when school social environments are characterized by frequent verbal and physical harassment and other aggressive social interactions among students (e.g. Adams & Russakoff, 1999). There is considerable evidence that many students are the victims of such harassment in middle schools and high schools (Olweus, 1993).

The issue is not limited to school safety. A wealth of research on the development of problem behaviors in youth has shown that serious behavior problems at school are associated with current or future problems in other areas, including school failure, delinquent behavior, problem drinking and drug use, and precocious or risky sexual behavior (Ary et al., in press; Ary, Duncan, Duncan, & Hops, 1999; Donovan & Jessor, 1985; Donovan, Jessor, & Costa, 1988; Patterson, DeBaryshe, & Ramsey, 1989; Patterson, Reid, & Dishion, 1992). Thus, the effectiveness of schools' methods for handling students' aggressive behaviors may affect the developmental course of many other problems (Bullis & Walker, 1993; Walker, Horner, Sugai, & Bullis, 1996). For example, punitive school and classroom environments, unclear rules and expectations, and inconsistent application of consequences have been shown to contribute to increased levels of student antisocial behavior, truancy, and acts of vandalism against the school (Mayer, 1995; Mayer, Butterworth, Nafpaktitis, and Sulzer-Azaroff, 1983;

Mayer, Mitchell, Clementi, & Clement-Robertson, 1993; Olweus, 1992).

The intervention tested in the present report was based on substantial prior research on the factors that influence aggressive and prosocial behavior in school settings (Walker, 1995; Walker et al., 1995). Important features of an effective school-wide behavior management approach include (a) increasing positive reinforcement for appropriate social behavior (Embry, 1997; Embry, Flannery, Vazsonyi, Powell, & Atha, 1996; Mayer, 1995; Taylor-Greene et al., 1997), (b) active teaching of appropriate social behavior (Colvin, Sugai, & Patching, 1993; Taylor-Greene et al., 1997), (c) clear communication of a small number of rules (Mayer, 1995), (d) the consistent provision of corrective consequences for rule violation (Taylor-Greene et al., 1997; Walker et al., 1995), and (e) ongoing monitoring of data about student behavior (e.g. office referrals for misbehavior) to provide feedback on progress and to pinpoint settings in which further attention is needed (Tobin, Sugai, & Colvin, 1996).

Given the evidence of the value of these procedures, it is appropriate to examine how schools can be assisted in implementing these approaches (Biglan, 1995; Colvin et al., 1996; Colvin & Sprick, 1996; Gottfredson, Gottfredson, & Skroban, 1998). We know far less about how to influence the widespread adoption of effective school practices than we do about what practices are effective. The present study may provide a modest contribution in this regard. Although the school with which we worked received considerable support from research staff for implementing a school-wide behavior management system, our efforts involved little direct contact with students.

Although several types of programs have been shown in well-controlled studies to produce reductions in aggressive or disruptive behavior and related youth problem behaviors, it is not clear that those programs will achieve similar results when they are implemented in middle schools by the regular school staff. Gottfredson et al. (1998) underscored the difficulties involved in implementing empirically based preventive practices in middle schools. These authors identified a variety of factors that can contribute to difficulties in implementing empirically based programs, including inadequate teacher training and support, overly complex intervention components, weak leadership at the district and school levels, and failure to involve sufficient school personnel in program planning and implementation.

Conversely, factors that have been shown to promote the adoption of innovative practices in school include availability of teacher time to work on the innovation (Ponti, Zins, & Graden, 1988; Witt, Martens, & Elliott, 1984), philosophical acceptance and perception of the importance of the intervention practice (Sparks, 1988), and teachers' perception of their technical competence and ability to influence student learning (Smylie, 1988). School structures do not tend to promote collaboration or the exchange of

ideas and support among staff (Mills & Pollak, 1993), yet providing increased support for teachers is critical for effectively bringing research-based interventions into the school setting.

A model of collaborative school consultation practices that involves teachers as active participants in the process of school-wide change has been advocated elsewhere (Bickel & Hatrup, 1995; Johnson, Malone, & Hightower, 1997; Linney & Seidman, 1989; Mills & Pollak, 1993). In this model, teachers get assistance and opportunities they desire in order to develop competencies, plan together, and share ideas (Englert, Tarrent, & Rozendal, 1993; Witt & Martens, 1988). In addition, an effective consultation approach involves data-based decision making (Sugai & Tindal, 1993) that includes a needs assessment and a formative and summative evaluation of the intervention (Ponti et al., 1988).

In the present study, we utilized a collaborative consultative model in which a small team of school staff was created to review, improve, and implement the school's discipline procedures. The team was assisted by consultants from the University of Oregon and Oregon Research Institute. The approach used, called Effective Behavior Support (EBS), was consistent with the collaborative model, since the school team was provided with information about what practices had proven effective elsewhere and with ongoing data about behaviors occurring at their school, but the team made all decisions about what features of the discipline approach would be used. The EBS approach was designed to help the school improve the clarity of its rules and increase active teaching of behavior expectations, positive reinforcement for appropriate social behavior, consistent provision of corrective consequences for rule violations, and ongoing monitoring of data for continuous improvement. It was hypothesized that such improvements in the school's behavior management practices would reduce the overall level of problematic behaviors, especially physical and verbal aggression, and would increase students' perceptions of school safety.

## Method

This evaluation of a school-wide intervention was embedded in a larger study testing the effects of a comprehensive community intervention, called CommunityBuilders, that was designed to prevent youth substance abuse, antisocial behavior, and other behavior problems. Only the evaluation of the school-based component of CommunityBuilders is reported here.

### *Design*

The design of the study was an AB design in one community with a comparison community. In this design, assessments of school behavior management practices, student behavior, and student reports of school climate were obtained repeatedly over a period of two or more academic

years. After a baseline period of one month (for student surveys) to one year (for monthly discipline referral data), the intervention was introduced into the middle school in one community but not in the second community. The first year of intervention implementation reflected relatively heavy involvement of research staff in the consultative process. The second year of intervention, called the "maintenance year," reflected less involvement from research staff and more independent activity on the part of school staff. These intervention procedures are described in detail below. Assessments continued for two years following the introduction of the intervention. Evidence regarding the effects of the intervention is provided by (a) comparing differences in baseline and post-intervention data in the school receiving the intervention, (b) examining whether the changes that occurred in the school receiving the intervention *did not* occur in the schools in the comparison community.

The school-based component of the CommunityBuilders intervention began in the middle school of the first community in September 1997. It should be noted that the 6th graders in the comparison community ceased to be valid comparitors in December 1998, as the Intermediate School began the implementation of activities that were expected to influence children's behavior at school. Therefore, student survey data for the 6<sup>th</sup> graders in the comparison community are presented only up until that time.

### *Participants*

Participants were the 6th, 7th, and 8th grade students at three schools in two Oregon communities (Cottage Grove [population 8,005] and a comparison community [population 6,360]). Both communities have neighboring cities within 20 miles and are approximately 40 miles from each other. The principal industries within the area are agriculture, timber, education, and tourism.

Participants in Cottage Grove were the entire student body attending Lincoln Middle School (grades 6-8). Enrollment at Lincoln Middle School was 645 during the intervention year and decreased to 617 in the maintenance year; 92% of the students were Caucasian, 5% Hispanic, 2% Native American, 1% Asian, and 1% African-American. In the school district, 42% of the students qualified for the federal free-lunch program, and an additional 12% qualify for reduced-price lunches. For the 1996-97 school year, the drop out rate for the district was 7.1% and the mobility rate was 11.4%.

In the comparison community, participants were all 6th graders at the intermediate school (grades 4-6) and all 7th and 8th graders at the middle school. The total enrollment of 6th graders at the intermediate school was 110 in 1997-98 (307 across grades 4-6), and 116 in 1998-99. The total enrollment of 7th-8th graders at the middle school was 215 in 1997-98 and 236 in 1998-99. These schools were predominately Caucasian (88%), with 5%

Native American, 4% Hispanic, 2% Asian, and 1% African-American. In the school district, 46% of the students received free lunches and 6% received reduced-price lunches. The drop out rate for the district was 7.2% and the mobility rate 12.8% for the 1996-97 school year. Thus, the intervention and comparison schools were comparable in terms of socioeconomic status and ethnic composition of their students, although they differed in their grade configurations.

Prior to the onset of the Effective Behavior Support intervention, Lincoln Middle School had no school-wide behavior support program in place. In prior years, the school had a system for giving tickets for a weekly drawing to students who showed exemplary behavior, but this system had fallen into disuse over the previous two years. When a student broke a school rule, s/he was given a discipline referral, his/her parent(s) and homeroom teacher were notified, and in some cases, the inner-school team would discuss the problem and work on solutions. For repeated and more serious behavior problems, students would be referred to a school counselor, the school psychologist, or the behavior specialist for the development of an individual plan. Available supports for these students included an anger management class, individual behavior contracts, individual behavior skills training, and a study hall for remedial instruction and study skills.

At the intermediate school (6<sup>th</sup> grade) in the comparison community, some school-wide behavior management procedures were already in place. Students received "Top Dawg" tickets for positive behavior which were entered into weekly prize drawings. All students at the school received instruction in conflict management (4-5 sessions) and all students attended an assembly where they learned five "guidelines for success." Students who displayed repeated behavior difficulties were referred to the counselor who developed behavior contracts and taught friendship skills.

At the middle school (7<sup>th</sup> and 8<sup>th</sup> grades) in the comparison community, a student "checkbook" system was used for school-wide behavior support. Students got T.N.T. ("Teachers Noticing Talent") tickets for positive behavior which were entered into their checkbook as a deposit of "funds." Students also got "funds" deposited into their checkbooks for good grades, test scores, organized binders, good attendance, and other special recognitions. Funds were withdrawn from students' checkbooks for bills (e.g., rent, water, food, newspaper, etc.) and for fines (e.g., overdue books, messy binders, etc.). The checkbook funds could be used for purchases at the student store or auctions at school assemblies. Teachers generally handled behavior problems in the classroom. Unlike Lincoln Middle School, office referrals were reserved for more serious behavior problems; the minimum consequence for a referral was suspension. For repeated difficulties a student was referred to the counselor who implemented an individual goal-setting plan with the student.

*The Effective Behavior Support Intervention*

The CommunityBuilders intervention began in the Cottage Grove community in Spring of 1997. It focused on assisting the entire community in increasing the likelihood that parents, schools, and other community members would (a) praise, promote, and reward youths' worthwhile behavior, (b) monitor and supervise youths' activities, (c) set and enforce safe limits on youths' activities, and (d) foster youths' constructive relationships with people of all ages. In addition to the school intervention described here, CommunityBuilders included media to affect parenting skills, a parenting skills program, supervised after-school recreation, and community advocacy.

The school component of the CommunityBuilders intervention involved assisting the school in implementing an Effective Behavior Support (EBS) system (Flannery, Sprague, & Todd, 1997; Sugai & Horner, 1994; Taylor-Greene et al., 1997) to increase appropriate social behavior in all school settings by (a) defining a set of clear rules and expectations, (b) teaching the expected behaviors to students, (c) providing increased levels of praise and rewards for appropriate social behaviors, (d) monitoring students' behavior to provide consistent enforcement of the rules, and (e) utilizing frequent summary data about student behavior to evaluate progress and further develop intervention plans. The goals of improving the social behavior of students and school climate were consistent with the school improvement plan that the school had developed in the prior year.

The intervention process began with a 75-minute faculty forum in the Winter prior to intervention implementation in which problem behaviors, the process of the EBS implementation, and an introduction to Community Builders were presented and discussed. An Effective Behavior Support (EBS) team then was formed with three teachers (one volunteer from each of the inner-school teams of grade-level teachers), one volunteer of the two school counselors, the vice-principal, project staff (a school intervention specialist and two research scientists) and two experts on EBS (the co-director of the Institute on Violence and Destructive Behavior from the University of Oregon and the prevention specialist from the county's Educational Services District). This team began meeting on a monthly basis in December, 1996, to develop the intervention plan. In the first three two-hour meetings, the team was trained in the EBS model. The training covered the development of problem behavior, school-wide behavior management principles, and using discipline referral data to make intervention planning decisions. Subsequently, the meetings became 1.5 to 2-hour work sessions, during which the team developed goals for target behaviors, defined the rules and expectations for the school, defined the reward systems, selected and developed the evaluation assessment tools, devel-



oped the lessons for teaching the behavioral expectations to the students, and worked out the logistics of implementing the lessons. Two half-day planning sessions also occurred during the summer.

The team continued to meet monthly throughout the intervention implementation year (1997-98) to monitor and guide the intervention process. During this phase, the research staff (a) helped form the agenda and actively participated in the EBS meetings, (b) met with the teacher grade level teams (approximately twice per month) to provide updates and get feedback on EBS, and (c) provided monthly summaries of referral, student survey, and incentive data to school staff. Throughout this process, team members, with the assistance of the researchers, served as liaisons to and from the inner-school teams, providing regular updates to their teams on EBS planning and activities and soliciting input to bring back to the EBS team.

During the 1998-99 intervention maintenance year, our consultation to the school teams was faded. Specifically, only the research team's school interventionist attended the monthly EBS meetings, which were led by the vice principal, and provided summaries of the student survey data every two months. School staff provided the summaries of the data on office referrals and incentives.

*Defining and teaching the behavioral expectations.* Based on a review of discipline referral summaries from the 1996-97 school year, the EBS team defined the student behaviors that they wanted to see increased in each setting of the school (e.g., classroom, hallway, cafeteria). Behavioral expectations were refined into four school-wide rules: Be Respectful, Put Ups-Not Put-Downs, Cooperate with Others, and Solve Problems Peacefully. For each rule, specific desired behaviors were identified for each setting. Under the guidance of the UO-based EBS expert, lesson plans to teach expected behaviors were collaboratively developed for each specific behavior. (See Table 1 for a list of the rules and specific behaviors.)

Table 1.  
*Behavioral Expectations Developed for Lincoln Middle School*

Rule	Specific Behavior
1. Be respectful	a. Use appropriate language b. Roles and responsibilities of students & teachers c. Respect others' space and belongings
2. Put ups, not put downs	a. Complimenting others b. Respond appropriately to put downs
3. Cooperate with others	a. Work together to peacefully share a locker b. Work together and help each other
4. Solve problems peacefully	a. Appropriate responses regarding rumors b. Appropriate responses to harassment/ name calling c. Appropriate physical contact

The lessons outlined what students were expected to do, how to teach the expected behavior, how to prevent the problem behaviors from occurring, how to give both positive and corrective feedback to students, and how to review the behavioral expectations with students regularly. The teaching strategies were based on instructional design principles for teaching concepts (Kameenui & Simmons, 1990), as well as a proactive approach for teaching social behavior (Colvin et al., 1993). Each 50-minute lesson included an explanation of why the rule was important, examples and non-examples of the expected behaviors, and practice of the behaviors via games, discussions, and role playing. To prevent problem behavior, each lesson outlined how teachers could supervise students in the most troublesome school settings and time periods, as well as how and when to provide to students reminders of the expected behaviors and praise and recognition for following the expectations. Teachers were trained in the implementation of these lessons during a half-day in-service in August, 1997, prior to start of the intervention in September.

The lessons were taught school-wide at the beginning of the 1997-98 school year. Teachers of 6<sup>th</sup> and 7<sup>th</sup> grade students taught all of the lessons within the first three weeks of the school year and 8<sup>th</sup> grade students received one lesson per week for a total of ten weeks.<sup>1</sup> Booster lessons were implemented in April to specifically address the issue of harassment in the hallways. Teachers received a half-day paid planning period to develop these 50-minute lessons, which varied in approach across grades and teachers; activities included role-playing, skits, posters, and writing assignments on harassment.

In addition to the lessons, the EBS team altered the class schedules so that passing times between classes for 6<sup>th</sup> grade students were different from those for 7<sup>th</sup> and 8<sup>th</sup> graders. Additionally, three lunch periods were scheduled so that students went to lunch with their own grade level. These schedule changes reduced the numbers of students in the hallways and lunch room at any one time.

In the following school year (1998-99), the EBS team refined the lessons on behavior expectations school-wide and teachers taught these full-day lessons during the opening days of school. Students spent 30 minutes at each of eight stations around the school (main office, hallways, cafeteria, bus zone, etc.), where teachers used skits and role-plays to teach expected behaviors in each setting, and then students participated in a 45-minute assembly at the end of the day at which behavior expectations were reviewed, and treats and prizes handed out. Teachers took the initiative to implement 50-minute booster lessons in expected hallway behavior in November 1998 and again taught 50-minute booster lessons on expected behavior via role plays and discussions in April. In addition, reflecting their increased commitment to decreasing students' problem behaviors, the school staff decided to implement the Second Step Violence Preven-

tion Curriculum (Committee for Children, 1990), a 15-lesson curriculum that teaches social problem-solving skills, empathy, and anger management. Sixth graders were taught the entire curriculum; 7<sup>th</sup> and 8<sup>th</sup> teachers decided to teach only portions of the curriculum. At the request of the school, the County ESD consultant provided assistance in training and implementation of the program.

*Systems for the positive reinforcement of appropriate social behavior.* One of the goals for the school intervention was to increase the positive reinforcement of appropriate or expected behaviors. During the 1997-98 year, the token economy in which "Tiger Tickets" were given for positive behavior was modified and revitalized. Additionally, three new school-wide recognition systems were implemented: "Good News" referrals, "Praise Notes," and a "Good News Bureau."

During the previous school year, Tiger Tickets had been given to students for engaging in prosocial behavior at the school. Students could turn them in for prize drawings (typically a soda or snacks). According to school staff, the system was not working well, as students were not receiving the tickets consistently and were not turning the tickets in. By the end of the school year, Tiger Tickets were not being handed out and no drawings were taking place. During the intervention year, the EBS team revitalized the Tiger Ticket program with the following changes: (a) tickets were given to students for following the specific behavior expectations as defined and taught school-wide; (b) teachers, administrators and other school staff, and students (with a teacher's signature) could give out Tiger Tickets; (c) businesses within the community were asked to donate prizes in order to increase the value of the tickets by increasing the value of prizes; (d) drawings occurred on a weekly basis with announcements of winners held during lunch; and (e) a tracking system was developed to count who was giving out and receiving the Tiger Tickets.

Second, a new method for providing recognition and rewards for students was the Good News referral system. Traditionally, teachers and other personnel sent discipline referrals to the school office only for students' misbehavior, but during the intervention year, Good News referrals were added to this system. Teachers sent positive referrals to administrators for students who had done something especially noteworthy (e.g. marked improvement in behavior or academics over an extended period of time, leadership role in helping other students, or preventing conflict with good problem-solving skills). The principal or vice-principal would then call the parents to notify them of their students' positive behavior.

Third, a Praise Notes computer program was developed by the research team to enable teachers to send notes of praise home with students. Once teachers entered their class rosters into the computer, they could select a praise note, click on the name of the student, and print a personalized note for the student to take home to his/her parent(s). Teachers could select a

pre-written praise note from a menu (e.g., "(Name) made a sincere effort to do quality work today. I hope you give her a pat on the back when she gets home, because she did great!", "Thank you for helping (name) on his homework assignments. He has shown real improvement."), or teachers could create their own praise message. Since the program ran slowly on some of the school's older computers, actual use of the program was not as high as the original interest in it.

Finally, another system of providing positive recognition was the Good News Bureau. The goal of the Bureau was to collect information about the good things that people had done in support of students' success and to disseminate that information through various media channels, such as the student newspaper, the school newsletter, the school public address system, bulletin boards at the school, the local newspaper, and the local radio station during the CommunityBuilders radio program. The research staff provided considerable assistance to the vice-principal in coordinating many of these activities.

During the 1998-99 intervention maintenance year, the Ticket system was expanded such that students could use their Tiger Tickets either for the weekly prize drawings or for purchases at the student store. The Good News referral system also continued and a few teachers continued to send Praise Notes home. The CommunityBuilders radio show continued in this school year as well but became difficult for school staff to maintain as research staff support was withdrawn and volunteer and audience participation decreased over the course of the year. In January, the school began the implementation of a consistent school-wide point card system (a Positive Behavior Response Card) for individual students who had higher incidences of behavior problems to allow for more systematic problem solving. The research staff provided consultation to the EBS team in the planning of the point card system.

*Monitoring progress.* During the 1997-98 intervention year, the research team summarized monthly data about student behavior to help the EBS team evaluate progress, make decisions on the further intervention efforts, and provide positive reinforcement to staff. Patterns of discipline and good news referrals, student survey data, and Tiger Ticket tallies were charted and discussed at the monthly EBS team meetings. The following week, a summary of these data were presented at the inner-school teams and teachers provided feedback and ideas to the EBS team. This summary also recognized and praised specific teachers for their efforts toward effective behavior support school wide.

School faculty were surveyed mid-year and at the end of the 1997-98 year on progress toward school improvement regarding school safety and student behavior and to evaluate the current school-wide behavior support systems. The results of these surveys were summarized and discussed during faculty forums, and the EBS team utilized the input from the sur-

veys and discussions for further planning.

During the 1998-99 maintenance year, the researchers' participation in data feedback was decreased. The discipline referral data and student survey data were still collected and charted by the researchers, although the school took responsibility for tallying and summarizing the Tiger Tickets. The school staff on the EBS team also assumed responsibility for summarizing and presenting the data to the rest of the school staff and bringing staff feedback back to the EBS team.

### Measures

*Measures of positive reinforcement for appropriate behavior.* Positive reinforcement to students was assessed in two ways for all schools. First, all students were asked on repeated School Climate Surveys to identify the number of times that a school staff member "praised you or gave you a reward for something you did well" on the previous day. Second, all tickets turned in for weekly prize drawings or for checkbook entries were tallied for the 1997-98 and 1998-99 school years in each school. It should be noted that the number of tickets turned in in a given week did not precisely track the number handed out, as students would sometimes save tickets and turn them in for drawings of particularly appealing prizes. The tickets turned in were tallied by grade and by gender.

Two additional measures of reinforcement activity were obtained at Lincoln Middle School. Counts of Good News referrals were summarized by totals per day, by grade level, and by gender. In addition, the number of Praise Notes distributed at Lincoln Middle school were tallied on each teacher's computer and provided to the research team by the teachers.

*Measures of discipline referrals.* Monthly student office referral records were obtained from Lincoln Middle School for the 1996-97 school year (baseline year), the 1997-98 year (intervention year), and the 1998-99 year (maintenance year). These referrals were routinely entered into a data base by school personnel and were summarized on a monthly basis by the average number of discipline referrals per day by grade level, by gender, and by category of offense. Categories of offenses were Harassment, Fighting, Bus Problems, Insubordination, and Other Referrals (such as tardies, class disruption, and obscene language). Specific definitions for student behavior violations warranting referral within each of these categories were documented in the school student handbook and did not change throughout the study period. For example, the definition for harassment was "threatening, intimidating, or badgering" and insubordination was "open defiance to staff member, refusal to obey in words or action."

Unfortunately, such measures of discipline referrals were not available at the schools in the comparison community because very few office referrals were actually recorded; most behavior problems were handled by classroom teachers and thus went unrecorded. One might argue that discipline

referral data do not provide a pure measure of student behavior, since they reflect teacher's response to student behavior as well. However, in the absence of costly and difficult direct observations of student behavior in middle schools, discipline referral data can provide a useful measure of the density of students' behavior problems in different settings and for different kinds of problems (Taylor-Greene et al., 1997; Tobin et al., 1996). Furthermore, Wright and Dusek (1998) found that although the rates of student aggression and other problem behavior documented via school discipline referrals vary significantly between schools, they tend to be stable within a school over time.

*Student reports of perceived safety.* Three items on the repeated School Climate Surveys asked students to rate how safe they felt in the hallways, classroom, and cafeteria. Students responded on a 5-point response scale from "Very Safe" to "Not at all Safe." Principal Components Analyses on School Climate Survey items were performed at several timepoints, and at each timepoint the three safety items converged into a single factor. Consequently, the proportion of students who reported feeling "quite safe" or "very safe" were averaged across the three settings to create a composite score reflecting Perceived Safety at school. The average Cronbach's alpha for these three items across the time points was .920 (range .887 to .956).

*Student reports of being the target of harassment.* The School Climate Survey contained two items measuring the degree to which students reported being the target of physical or verbal aggression. The physical aggression item asked the student to report the number of times on the previous day that another student had "hit, pushed, or physically fought you" at school. The verbal aggression item asked students to report the number of times on the previous day that another student "called you names, swore at you, or said mean things to you" at school. In the Principal Components Analyses of the School Climate Survey, these two harassment items converged into a single factor. Thus, the proportion of students reporting that they were verbally or physically harassed one or more times were averaged together into a single score reflecting the proportion of students who were the target of harassment at school. The average correlation coefficient of these two harassment items across the time points was  $r = .672$ ,  $p = .000$  (range .550 to .755).

*Process measures of EBS implementation.* Mid-way through the intervention year (February 1998), staff at Lincoln Middle completed an anonymous survey of process measures of EBS curriculum implementation. This survey provided measures of staffs' perceptions of student behavior in the current year compared to the previous year and their perceptions of the impact of specific strategies (e.g. recognition systems, teaching of behavior expectations, discipline consequences) on student behavior. In addition, teachers and administrators were asked to rate the frequency with which they had implemented specific strategies to support student behavior in

the past month. The survey was completed by 17 teachers (61% of all teachers), three education assistants (60%), two administrators (100%), two counselors (100%), and four office staff (100%).

#### *Student Survey Assessment Procedures*

Students in each school were periodically surveyed with a one-page anonymous questionnaire about the school climate. This School Climate Survey was developed by the research team in collaboration with school staff at Lincoln Middle School. Students' reports of being the target of verbal or physical aggression and their perceptions of safety have been shown to be a useful method of assessing the outcomes of school-wide programs to reduce bullying (Olweus, 1992). Teachers distributed the surveys during class time, and students placed completed surveys into a privacy envelope. Students were free to decline participation. On average, 87% of the students in Cottage Grove and 89% of the students in the comparison community completed the surveys.

The surveys were conducted on four weekly occasions in the Spring of the 1996-97 school year with students in grades 6 and 7 at Lincoln Middle School and with students in grade 7 at the comparison middle school.<sup>2</sup> These data provided a baseline against which the effects of the EBS intervention at Lincoln Middle School could be evaluated.

During the 1997-98 year, all 6th, 7th, and 8th graders were assessed in all schools. In Lincoln Middle School (6th-8th grades) and the comparison middle school (7th-8th grades), surveys were obtained twice in September, and monthly thereafter for a total of 10 assessments. For 6<sup>th</sup> graders in the comparison community, surveys were completed on a monthly basis September through May, for a total of 9 surveys. Again during the 1998-99 year, all 6th, 7th, and 8th graders were assessed in both communities. At the request of staff at Lincoln Middle School, however, the assessment schedule there was reduced to bi-monthly, for a total of five data points across the school year.

## **Results**

#### *Analytic Procedures*

The discipline referral data were analyzed with interrupted time series analysis (ITSACORR; Crosbie, 1993; 1995) to determine whether the level of referrals decreased significantly from the 1996-97 (baseline year) to the 1997-98 and 1998-99 school years (post-intervention). ITSACORR compares two series of data points to determine whether there is a significant change in intercept and slope between the two phases (baseline and post-intervention). The analysis is based on the time series model, but corrects the estimate for autocorrelation by accounting for the number of time-points in the experiment (Crosbie, 1995). The corrected autocorrelation estimate

is included in the general linear model to produce an omnibus F-test for the overall change in intercept and slope between the two series, and t-tests for the significance of change in intercept and slope independently. Because slope in the data could cause a significant change in intercept without reflecting an actual change, it is important to consider the significance of the F-test first. All results reported here use a one-tailed test of significance.

Unfortunately, ITSACORR time series analysis or other statistical techniques could not be used for analyzing the School Climate Survey data because of the unequal time intervals between data points in the baseline and intervention phases and because of the short baseline period. Thus, for the School Climate Survey data, we simply present the data in graphic form for each of the communities (Barlow, Hayes, & Nelson, 1984). It should be noted that comparisons are drawn between the same grade levels across years (e.g. 6<sup>th</sup> graders in 1997-98 vs. 6<sup>th</sup> graders in 1998-99), rather than comparing a particular cohort across time (e.g. 6<sup>th</sup> grader in 1997-98 vs. 7<sup>th</sup> graders in 1998-99). Although we acknowledge that differences in cohorts of students may influence these data, differences in the ways in which 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> graders are treated by staff and other students are likely to provide a greater confound to an attempt to attribute changes over time to the effects of the intervention, if comparisons are only made between cohorts. Since the aim of the intervention was to change the social context of the school, rather than individual students, we chose to compare across grade levels to allow us to examine the degree to which the experience of being a 6<sup>th</sup>, 7<sup>th</sup>, or 8<sup>th</sup> grader had changed as a function of the intervention.

#### *Positive Reinforcement for Appropriate Behavior*

*Student reports of positive reinforcement by staff.* Figure 1 presents the proportion of students who reported on the School Climate Survey that a staff member at the school had praised or rewarded them one or more times on the previous day for something they did well. The upper graph presents the data for Lincoln Middle School, and the lower graph does so for the two schools in the comparison community.

As can be seen, there were increases in the proportion of students at Lincoln Middle School who reported receiving praise or reward. An average of 50.4% of 6<sup>th</sup> grade students and 45.1% of 7<sup>th</sup> grade students reported praise or reward during baseline. These proportions were higher after EBS was implemented in the 1997-98 school year. The means of the proportion of students reporting praise or rewards in 1997-98 were 60.7%, 57.4%, and 52.2% for grades 6, 7, and 8, respectively. This constitutes a 20.4% increase in positive reinforcement for 6<sup>th</sup> graders and a 27.3% increase for 7<sup>th</sup> graders. Indeed, only one of the data points for the 6<sup>th</sup> graders during the intervention year was below the mean proportion for the



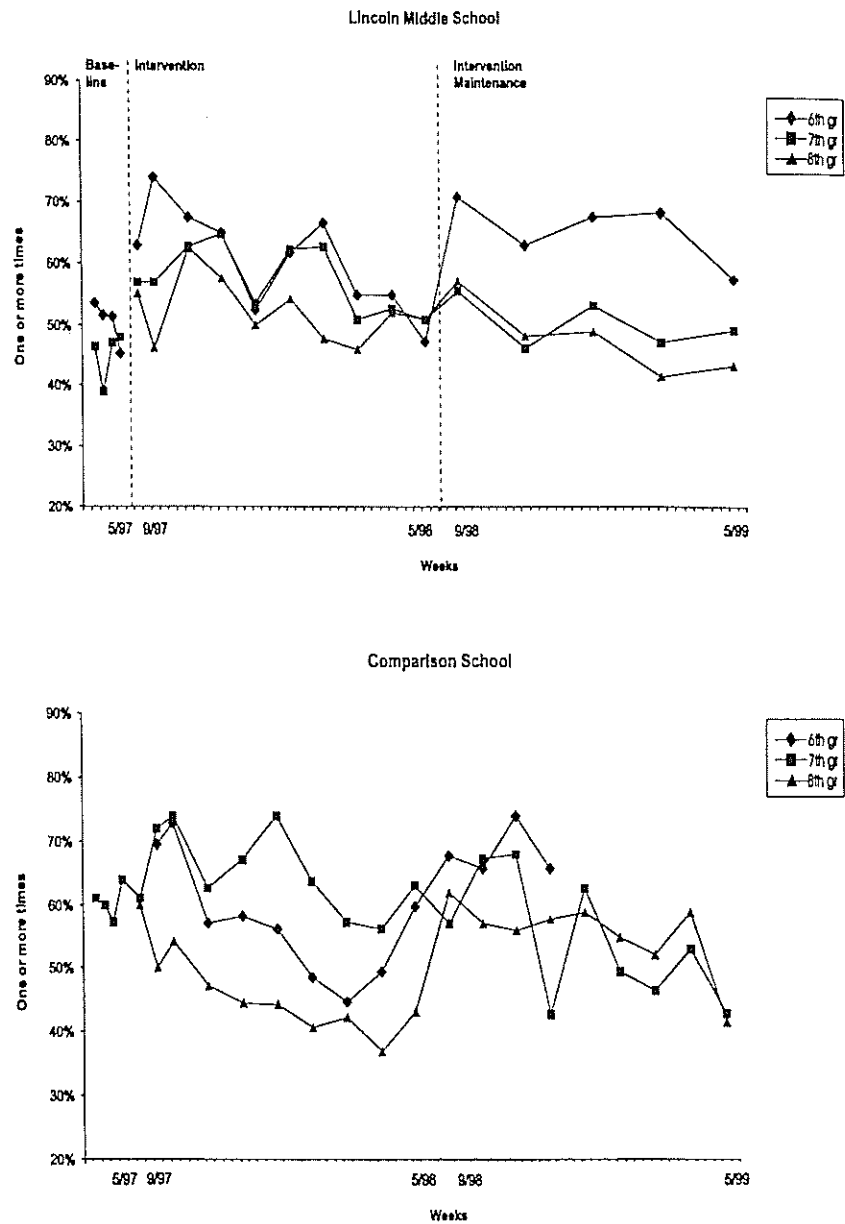


Figure 1. Percent of students reporting that a school staff member gave them praise or reward the previous day.

baseline year, and none of the data points for the 7<sup>th</sup> graders during the intervention year was as low as the baseline mean for 7<sup>th</sup> graders.

In the 1998-99 maintenance year, reports of positive reinforcement continued to improve for 6<sup>th</sup> graders (mean proportion reporting praise or reward = 66.6%, a 9.7% increase from the previous year and a 32.1% increase from the baseline year). Reports of positive reinforcement declined somewhat for 7<sup>th</sup> graders (mean proportion = 49.3%, a 12.5% decrease from the previous year, but still an 11.3% improvement over the baseline year) and for 8<sup>th</sup> graders (mean proportion = 47.8%, an 8.4% decrease from the previous year).

In the comparison community, baseline data were available only for 7<sup>th</sup> grade students. A higher proportion of these 7<sup>th</sup> graders reported receiving praise and reward during baseline than was true for Lincoln Middle School 7<sup>th</sup> graders, but they did not appear to experience an increase in praise and rewards to the extent that was true for Lincoln Middle School. Specifically, the average proportion of comparison 7<sup>th</sup> graders who reported receiving some kind of praise or reward the previous day was 60.6% during the 1996-97 year and 65.1% during the 1997-98 year, a 7.4% increase. In the 1998-99 school year, the mean proportion of 7<sup>th</sup> grade students reporting praise or reward was 54.4%, a 16.4% decrease from the previous year and a 10.2% decrease from the first baseline year. Comparison 6<sup>th</sup> and 8<sup>th</sup> graders showed increases in positive reinforcement, however, between the latter two years of assessment, although we made no attempt to influence positive reinforcement in the comparison schools during the period shown on the graph. The 6<sup>th</sup> graders reported a 19.2% increase between 1997-98 and the first four months of 1998-99 (mean proportion = 57.3% in 1997-98; 68.3% in 1998-99), and 8<sup>th</sup> graders reported a 19.7% increase (mean proportion = 46.3% in 1997-98; 55.4% in 1998-99).

*Rewards distributed.* During the year prior to the intervention (i.e., 1996-97), the school did not keep records of the number of Tiger Tickets given, but the Assistant Principal in charge of the program reported that very few were given out. No information was available from the comparison schools about the number of rewards given during this year.

During the 1997-98 school year, a total of 14,219 Tiger Tickets were turned in by students, an average of 1,580 per month (ranging from 125 to 2,659 per week). Over the year, the average number of tickets received per student was 22, or 2.45 per student per month. Gender distribution was equal: 7,119 were given to girls and 7,100 given to boys. The breakdown by grade indicated that younger grades received more tickets than older grades (6<sup>th</sup> grade: 7,616; 7<sup>th</sup> grade: 4,231; 8<sup>th</sup> grade: 2,372). During the 1998-99 maintenance year, the total number of Tiger Tickets increased to 27,583, for an average of 3,065 per month (4.97 per student per month).

Data from the comparison community suggest that the intervention increased reward distribution at Lincoln Middle School to levels comparable

to those at the comparison schools, where reward systems had been actively in place since the start of the study. In the comparison community, 2,058 tickets were given to 6<sup>th</sup> grade students (1,112 to males and 946 to females) during the 1997-98 school year. The range was 0 to 223 tickets per week, for an average of 229 per month. This reflects an average of 18.7 tickets per student for the whole year and 2.08 per student per month. During the first four months of the 1998-99 year, the total number of reward tickets turned in by students was 1,181 for an average of 394 per month (an increase to 3.40 per student per month).

At the comparison Middle School, a total of 4,824 tickets were given out to 7<sup>th</sup> and 8<sup>th</sup> graders during the 1997-98 school year. Breakdowns by grade and gender were not available. The range was 0-495 per week with an average of 536 per month. This reflects an average of 22.4 reward tickets per student for the whole year and 2.49 per student per month. During the 1998-99 school year, the total number of reward tickets decreased to 3,155 at the middle school, for an average of 351 per month (an average of 1.49 per student per month).

*"Good News" referrals.* A total of 222 Good News referrals were given out at Lincoln Middle School over the course of the 1997-98 school year, an average of 0.34 per student. Good News referrals continued to be given out over the course of the 1998-99 maintenance year, although the number decreased to 188, an average of 0.30 per student.

*Praise Notes.* A total of 269 Praise Notes were given to students by 14 different teachers during the 1997-98 school year. No data on Praise Notes were available for the 1998-99 school year.

### *Effects on Discipline Referrals*

There were 1746 total discipline referrals at Lincoln Middle School in 1996-97. That number dropped to 1256 during the 1997-98 school year, a 28% reduction. In the 1998-99 school year, the number of referrals dropped further to 1027, an 18% reduction from the previous year and a 41% reduction from the baseline year.

Despite this substantial drop in referrals, an ITSACORR analysis showed that the total number of referrals per month was not significantly different between the year prior to intervention (1996-97) and the two years post-intervention (1997-98/1998-99). In order to examine whether changes in discipline referrals might be concentrated in particular grades or genders or among specific types of referrals, however, time series analyses were performed for each grade, for each gender, for each offense, and for each offense by gender. (Unfortunately, the data were not recorded according to both grade and gender; thus, they cannot be analyzed by gender within grade.)

When the total number of referrals per month for each grade (across both genders) was examined, there was a significant overall effect on re-

referrals for 7<sup>th</sup> graders between the baseline and post-intervention years,  $F(2, 24) = 3.64, p = .042$  and a significant reduction in intercept,  $t(24) = -2.51, p = .02$ , but no significant change in slope. These data are displayed in Figure 2.

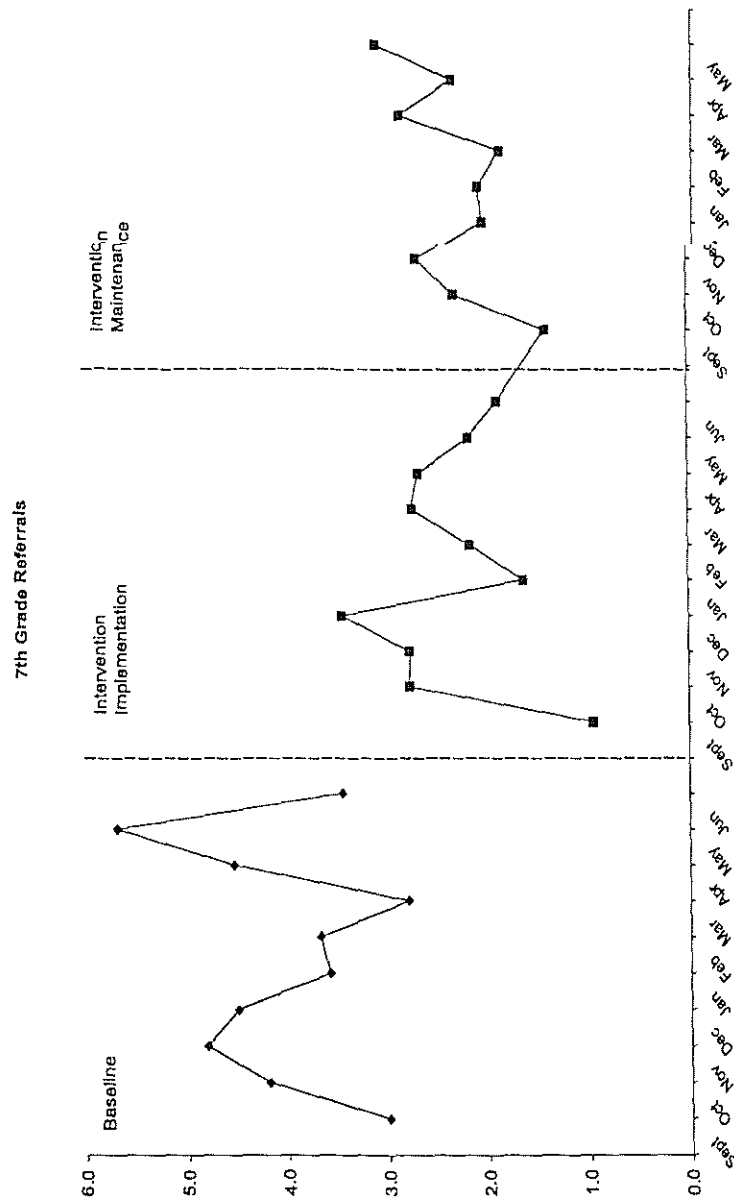


Figure 2. Average daily discipline referrals per month for 7<sup>th</sup> graders at Lincoln Middle School in 1996-97, 1997-98, and 1998-99.

Analyses of the 8<sup>th</sup> grade data showed an overall non-significant trend toward a reduction in discipline referrals,  $F(2, 24) = 2.99, p = .069$ . The  $t$ -value for intercept,  $t(24) = -2.87, p = .008$ , was significant, indicating that the level of referrals was reduced. An effect for slope,  $t(24) = 2.37, p = .03$ , was due to the slope becoming less negative in the intervention phase. There was no overall effect on total referrals for 6<sup>th</sup> graders, nor for males or females.

Breaking down the data by type of referral, there was a significant overall effect on referrals for Harassment,  $F(2, 24) = 3.703, p = .04$ , a significant reduction in intercept,  $t(24) = -2.87, p = .008$ , and a significant downward change in slope,  $t(24) = 2.62, p = .02$ . No effects were found on referrals for Bus Problems, Insubordination, Fighting, or Other Referrals.

Examining offense by gender, it appears that the effects on Harassment were isolated among males. A significant overall effect,  $F(2, 24) = 4.65, p = .02$ , and significant changes in both intercept,  $t(24) = -3.37, p = .003$ , and slope,  $t(24) = 3.03, p = .006$ , indicated a significant reduction in the mean level of harassment among males as well as a significant downward trend over time. These data are displayed in Figure 3. There were no other effects for males on the other types of referrals, nor were there any effects on specific types of referrals for females.

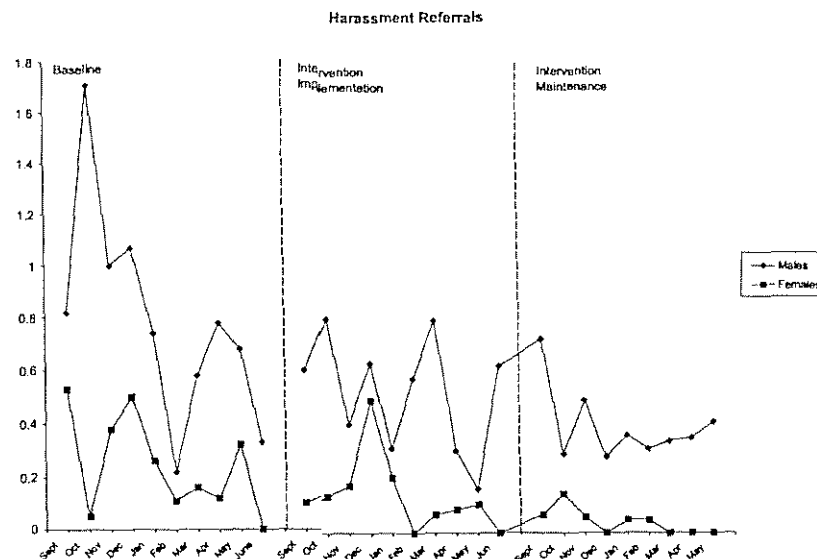


Figure 3. Average daily discipline referrals per month for harassment among males and females at Lincoln Middle School in 1996-97, 1997-98, and 1998-99.

It is possible that the reductions in referrals reported here happened because students who would have received one or two referrals in previous years received none under the EBS system. Alternatively, EBS could have reduced the number of referrals that chronic offenders received. Inspection of the distribution of the number of students by number of referrals over the year suggested that both mechanisms were at work (see Figure 4). The total number of students who received a referral during the school year was reduced from 345 in the baseline year to 311 during the intervention year (a 10% reduction), and to 280 in the maintenance year (a 19% reduction from baseline). Approximately the same number of students had one or two referrals in 1996-97 and 1997-98, although this number decreased by 15% in 1998-99. There were more dramatic reductions across the three years' time, however, in the number of students who had ten or more referrals. Specifically, 38 students received 10-19 referrals in 1996-97, 31 did so in 1997-98, and only 23 did in 1998-99 (a 39% reduction). Similarly, 15 students received 20-30 referrals in 1996-97, only 4 did so in 1997-98, and only one did so in 1998-99 (a 93% reduction).

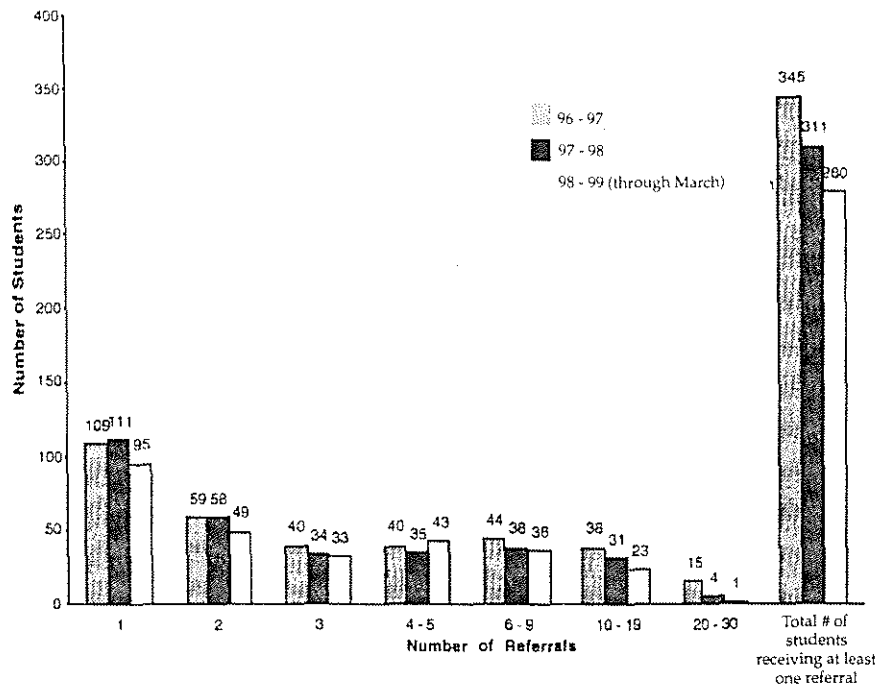


Figure 4. Number of students receiving one or more referrals at Lincoln Middle School.

*Effects on Students' Perceptions of Safety*

Figure 5 presents the proportion of students who reported feeling safe in the hallways, classroom, and cafeteria. Compared to the baseline year, a larger proportion of both 6<sup>th</sup> and 7<sup>th</sup> grade students felt safe at Lincoln Middle School during the year in which EBS was implemented. This trend continued during the follow-up maintenance year for 6<sup>th</sup> and 7<sup>th</sup> graders but not for 8<sup>th</sup> graders. The average proportion of 6<sup>th</sup> graders feeling safe during the baseline period was 59.3% and increased to 75.6% after EBS was implemented, a 27.5% increase. The proportion reporting feeling safe remained relatively stable for the 1998-99 school year at 72.2%. For 7<sup>th</sup> graders, the average proportion reporting feeling safe was 56.4% in the baseline assessments and 60.2% after EBS was implemented, a 6.7% increase. In the 1998-99 school year, the proportion of 7<sup>th</sup> graders feeling safe increased another 14.6% to 69%. This represented a 22.3% increase in ratings of safety over the baseline phase.

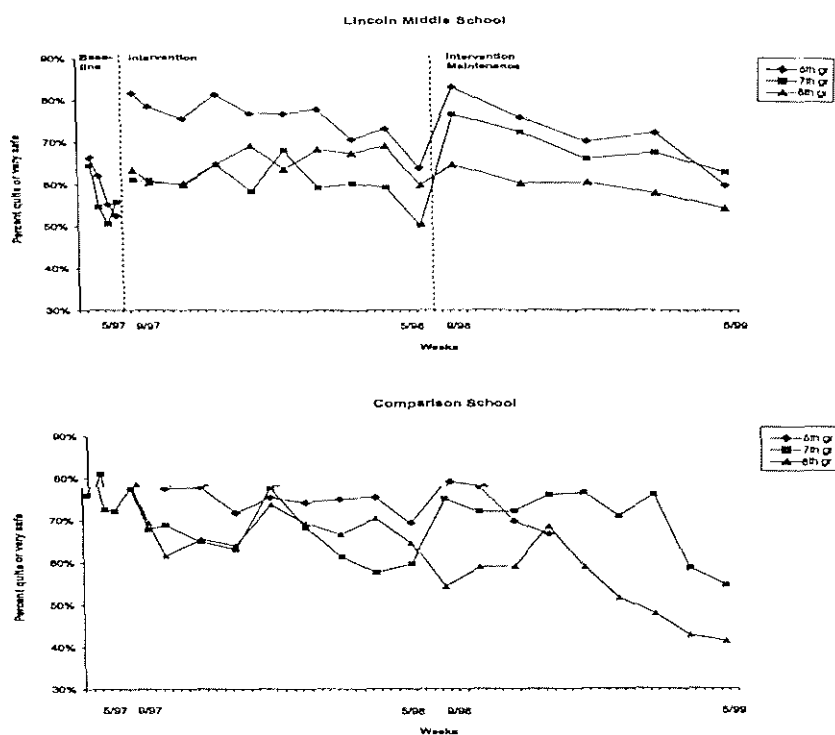


Figure 5. Average proportion of students reporting feeling "quite" or "very safe" in the hallways, classroom, or cafeteria.

Similar improvements were not seen in the comparison community. For 7<sup>th</sup> graders, the average proportion of students who reported feeling safe was 75.4% in the 1996-97 baseline period and subsequently decreased to 66.6%, a 11.6% reduction. In the 1998-99 intervention maintenance year, safety ratings did rebound slightly. For 7<sup>th</sup> graders, 70.2% reported feeling safe, but this was still below the levels in 1996-97. Decrements in ratings of safety between 1997-98 and 1998-99 were also seen for comparison 6<sup>th</sup> and 8<sup>th</sup> graders: 6<sup>th</sup> graders showed a 1.6% decrease in the proportion feeling safe (from 74.6% in 1997-98 to 73.4% in the first four months of 1998-99), and 8<sup>th</sup> graders showed a 21.6% decrease (from 68.4% to 53.6%).

A noteworthy feature of these data is the notable drop in ratings of feeling safe in both communities and all grades (with the exception of 7<sup>th</sup> graders in the comparison community) during the May 1998 assessment. This assessment occurred during the week following the fatal shootings at Thurston High School in Springfield, Oregon, a community within 60 miles of each study community. Similar drops in safety ratings were seen in the following April and May 1999 assessments, shortly after the fatal shootings at Columbine High School in Littleton, Colorado, and at the one-year anniversary of the Thurston shooting (which received much local media attention).

#### *Effects on Student Reports of Being the Target of Harassment*

Figure 6 presents the percent of students who reported that they had been physically attacked or verbally harassed by another student on the previous day across the baseline and intervention phases for both communities. Inspection of the Lincoln Middle School data suggests that the level of physical and verbal aggression was lower during the year in which the EBS program was implemented, compared to the spring of the previous year. The average proportion of students reporting being the target of physical or verbal aggression the previous day during the 1996-97 baseline was 46.3% for 6<sup>th</sup> graders and 50.5% for 7<sup>th</sup> graders; the average proportion for the 1997-98 intervention year was 30% for 6<sup>th</sup> graders and 34.7% for 7<sup>th</sup> graders. These figures reflect a 35.2% decrease for 6<sup>th</sup> graders and a 31.3% decrease for 7<sup>th</sup> graders.

In the 1998-99 maintenance year, these downward trends continued for 7<sup>th</sup> and 8<sup>th</sup> graders, with the mean proportion reporting being the target of aggression dropping to 27.8% for 7<sup>th</sup> graders and 26.1% for 8<sup>th</sup> graders. These figures reflect 19.9% and 32.5% reductions (respectively) from the previous year, and for the 7<sup>th</sup> graders, a 45% decrease from the baseline phase. Little change was seen in the maintenance year for 6<sup>th</sup> graders (mean proportion = 31.3%).



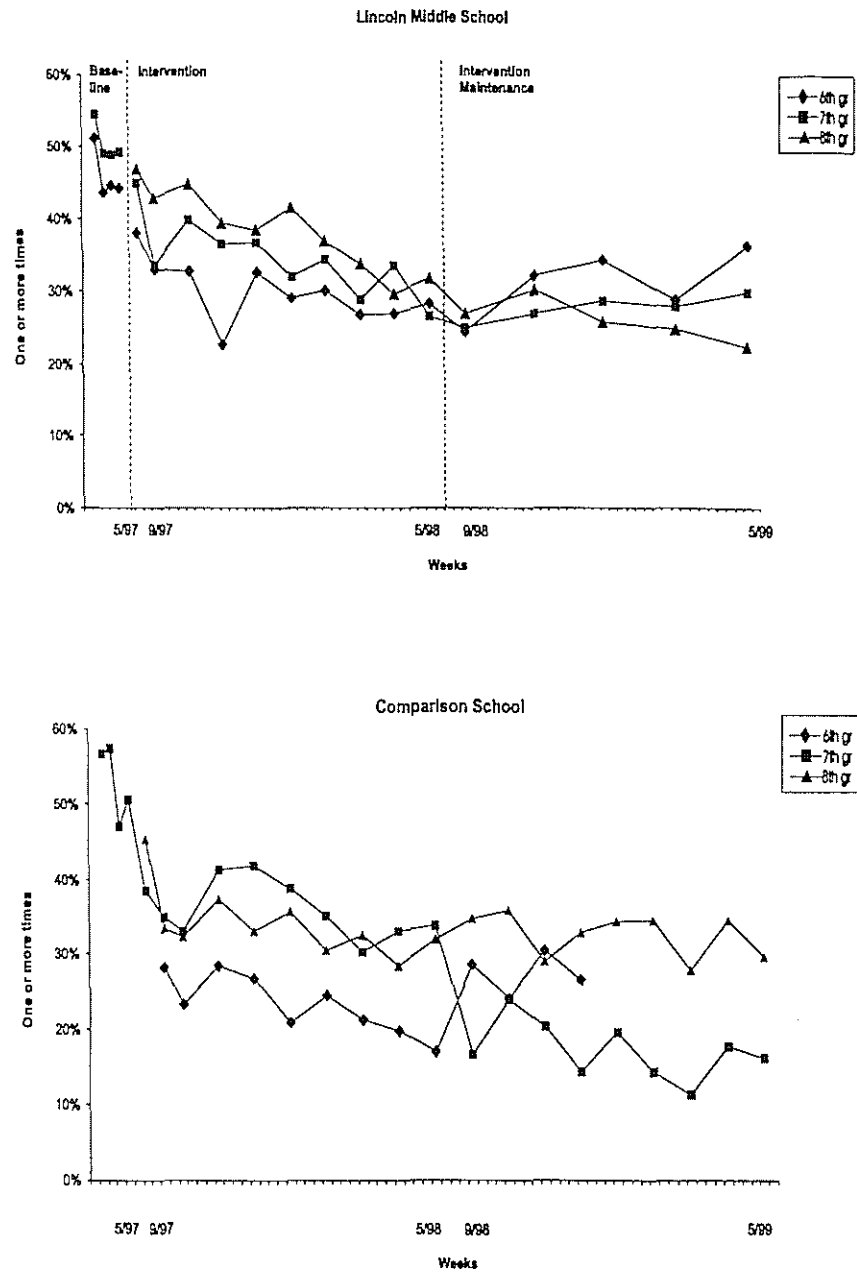


Figure 6. Average proportion of students reporting being the target of verbal or physical aggression the previous day.

The data from the comparison community suggest, however, that the effect on physical and verbal aggression at Lincoln Middle School may not have been due the EBS program, since the drop in 7<sup>th</sup> graders' reports of being the target of harassment from the 1996-97 assessments (53%) to the following year (36.1%) was as large (a 31.9% reduction). These reductions persisted into the 1998-99 year for 7<sup>th</sup> graders (to a mean proportion of 17.2%), although 6<sup>th</sup> and 8<sup>th</sup> grade students in the comparison community did not see such dramatic reductions. Comparison 6<sup>th</sup> graders showed a 17.5% increase in reports of being the target of physical or verbal aggression from 1997-98 (23.4%) to 1998-99 (27.5%), and 8<sup>th</sup> graders showed a 4.4% decline (34.1% in 1997-98 to 32.6% in 1998-99).

#### *Process Data from EBS Implementation Measures*

Table 2 presents a summary of the mid-year teacher survey data on EBS implementation. These surveys indicated that 79% of school staff surveyed agreed that the school was a safer place for students than the previous (baseline) year, and 86% agreed that student behavior had improved compared to the previous year. Further, 100% of the faculty surveyed agreed that providing recognition to students for positive behavior had had a positive impact on students' behavior. A majority of the teachers and administrators surveyed indicated that they had implemented EBS-related lessons and activities at least once in the past month. For instance, at least once in the past month, 65% reported having done a whole class activity or lesson focused on one of the target behaviors, 69% reported having integrated lesson principles into other course content, 100% reported having led the class in a "teachable moment" by applying the targeted behaviors to help solve a problem, and 90% reported having intervened in a conflict by prompting student use of behaviors taught in the lessons. Eighty-six percent reported having reinforced students for appropriate social behavior with Tiger Tickets or Good News referrals at least once per week.

Table 2.  
*Teacher Reports of EBS Implementation*

Staff perceptions of student behavior	SA/A <sup>1</sup>	NA/D <sup>1</sup>	D/SD <sup>1</sup>	NO <sup>1</sup>
1. The school is a safer, more orderly place to teach and learn than last year.	79%	18%	0	3%
2. Student behavior, on the whole, has improved this year.	86%	7%	0	7%
3. The following strategies have had a positive impact on student behavior:				
a. Students are recognized for positive behavior.	100%	0	0	0
b. Teachers and staff have led more activities/lessons that teach prosocial behavior.	75%	11%	0	14%
c. Disciplinary consequences are more appropriate and consistently applied.	41%	44%	11%	4%
Teachers' Reports of EBS Implementation	Daily	Once/wk	Once/mo	Never

4. Spent time with class on EBS lesson or activity	6%	24%	35%	35%
5. Intervened in conflict by prompting use of skills taught in lessons	25%	55%	10%	10%
6. Commented on/reinforced student use of skills taught in lessons	20%	55%	25%	0
7. Integrated lesson principles into other course content	6%	50%	25%	0
8. Used precorrective reinforcement (reminders) to encourage desired behavior.	28%	61%	11%	0
9. Led class in "teachable moment" by applying targeted skills to help solve a problem.	6%	59%	35%	0
10. Gave out Tiger Tickets or Good News Referrals to students for using targeted skills	38%	48%	14%	0

Note 1: SA/A = Strongly Agree or Agree; NA/D = Neither Agree nor Disagree; D/SD = Disagree or Strongly Disagree; NO = Not enough information for opinion

### Discussion

The Effective Behavior Support program appears to have been successful in increasing the level of praise, reward, and recognition for appropriate social behavior at Lincoln Middle School, with substantial increases in the number of Tiger Tickets given to students, the formal recognition of appropriate social behavior with Good News referrals, and Praise Notes sent home to parents. The increase in the level of praise, reward, and recognition at Lincoln Middle School during the intervention implementation year was confirmed by student responses to the surveys.<sup>3</sup> The maintenance year saw continued increases in reports of positive reinforcement for 6<sup>th</sup> graders, although they leveled off and declined somewhat for the older students. Measures of positive reinforcement at the comparison schools did not show comparable increases.

The EBS program also had the desired effect on students' socially aggressive behavior. The rate of discipline referrals was lower after the intervention began, the difference being statistically significant for 7<sup>th</sup> graders and for harassment by males. On the School Climate Survey, there was an improvement during the intervention implementation year in the proportion of students who reported that they felt safe in the hallways, cafeteria, and classrooms, and these changes were not matched by changes in the schools in the comparison community. Although a general downward trend across the school year is seen for all years, average safety ratings continued to improve for 6<sup>th</sup> and 7<sup>th</sup> graders in the maintenance year as well. In addition, the proportion of students who said that they had been physically or verbally attacked the previous day dropped for all grades in the intervention year and continued to decline for 7<sup>th</sup> and 8<sup>th</sup> graders in the maintenance year. These decreases at Lincoln Middle School, however, were matched by changes in the comparison community, so they cannot be credited to the EBS program with great confidence.

The present study has distinct limits. The evaluation of the effects of the EBS program involved analysis of time series data from one middle

school that received the program. The primary criterion for judging that the program had an effect was the observation of a distinct change in the level or slope of the time series following introduction of the program. Using this criterion, time series analyses were appropriate for analyzing the discipline referral data. Such a statistical analyses was not possible for the School Climate Survey data, however, due to the irregularity of assessment intervals. According to the criterion stated above, there was clear evidence that praise, rewards, and recognition increased at Lincoln Middle School when EBS was implemented and that the rate of discipline referrals for 7<sup>th</sup> grade and for harassment among males, declined. Review of the School Climate Survey data suggests that students were less frequently victimized by aggression and felt safer in the hallways and cafeteria.

The second criterion for judging the effects of EBS was whether there was an *absence* of comparable change in the time series in the comparison schools that did not receive EBS. In some cases, such as student surveys, comparable data were available from the comparison community, although only for 7<sup>th</sup> graders during the baseline period. In the case of discipline referral data, the referral and recording practices of the comparison schools were sufficiently different that they were not deemed appropriate to use as a comparison. By this second criterion, some of the changes in data at Lincoln Middle School cannot be attributed to EBS with confidence. For example, reductions at Lincoln Middle School in student survey reports of aggressive physical and verbal attacks were paralleled by similar reductions in the comparison community.

Other limitations to the study should be noted. The EBS process brought about the implementation of various kinds of intervention activities to the school. Specifically, school staff at Lincoln Middle School increased their delivery of praise and rewards to students, implemented schedule changes to decrease the numbers of students in common areas of the school at one time, and clearly defined and taught behavioral expectations to the students. In this study, we are not able to examine the independent effects of each of these intervention activities. In addition, teachers' awareness of the goals and outcomes of the intervention could have led to changes in their referral behavior in the absence of actual changes in students' behavior. This limitation is mitigated, however, by the fact that behaviors warranting referral were clearly defined and did not change throughout the course of the intervention, and by the fact that student reports, teacher reports, and school records all showed fairly consistent evidence of an improved school climate.

In addition, since this was applied field research, many aspects of the schools' practices were not under our control. For example, the delivery of the Second Step Curriculum in the 1998-99 maintenance year presents a potential confound to comparing the effects of the EBS program per se at Lincoln Middle School in that year. Furthermore, there were several as-

pects in which our comparison schools were not as comparable to Lincoln Middle School as would be desirable; for example, the different configuration of grade levels in the schools (6<sup>th</sup>-8<sup>th</sup> vs. 4<sup>th</sup>-6<sup>th</sup> and 7<sup>th</sup>-8<sup>th</sup>), differences in the sizes of the schools, pre-existing differences in levels of behavior problems and in behavior management practices, and different methods of recording discipline referrals made some comparisons difficult.

One could argue that a randomized controlled trial in which multiple schools were randomized to receive or not receive the intervention would provide a more rigorous evaluation of the Effective Behavior Support program, and we would agree. Such a study, however, would cost much more than the current, not inexpensive, study. Such a design would also require that the intervention process and the salient features of the intervention be so well-specified that they could be replicated in multiple schools, and given the collaborative approach of the EBS process, the intervention activities would not likely be exactly the same in all schools. Knowledge of how to assist middle school staff in achieving improvements in their behavior management practices through a consultative process is still limited, however. At this stage of our knowledge, perhaps it is more appropriate to concentrate our resources in single schools, to learn how to achieve an effect in that school, and to refine and replicate the intervention in each subsequent community. Biglan, Ary and Wagenaar (1998) present a more extensive discussion of the value of such interrupted time series experiments for the development of effective interventions. Indeed, Hawkins and colleagues' have described three levels of clinical research (Hawkins & Hursh, 1992; Hawkins & Mathews, 1999)<sup>4</sup> and according to their criteria, the present study constitutes Level 2 research. These authors advocate that Level 2 research is undervalued and underutilized, although it is critical to the advancement of our technology for solving social and psychological problems.

The current results are, at best, suggestive that the type of consultative approach to improving behavior management practices described here is worth attempting to replicate. The key elements of an effective behavior management program appear to be (a) teaching appropriate social behavior, (b) greatly increasing reinforcement for such behavior, (c) clear communication of a small number of rules, (d) the consistent provision of corrective consequences for rule violation, and (e) ongoing monitoring of student outcomes and school climate to assess and adjust procedures.

Important elements of a consultative approach to working with schools can also be gleaned from our experience in this study. Establishing a structure for reviewing and improving the school's behavior management practices, providing research-based information on sound behavior management principles and on what approaches had worked elsewhere, providing assistance in using data for sound decision-making, and providing

frequent feedback and recognition to teachers for progress achieved, all seemed important aspects of our consultative relationship with the school. At times, however, the greatest challenges to this process involved uneven staff support for the school-wide changes and insufficient engagement of some staff in the EBS process and activities. Taking steps early in the process to elicit school-wide staff support for the program and to establish an effective system of continuous feedback between the inner-school teams and the EBS team would seem to be useful steps to help mitigate against such problems.

If the present effort was somewhat more successful in bringing about school-wide change than some others that have been reported (e.g., Gottfredson et al., 1998), it may be due to its focus on changing the social environment of the school rather than focusing primarily on affecting individual students' cognitions, attitudes, and behaviors. In our view, theoretical approaches to changing youth's behavior too often treat their cognitions, behaviors, and skills as though they are unrelated to their social context. This approach encourages the use of programs that place the greatest emphasis on teaching skills and changing attitudes, but frequently ignores the ongoing social environment which shapes, reinforces, or punishes the behaviors that the programs seek to establish. The alternative conceptualization posits that young peoples' behaviors (including their attitudes and other cognitions) are shaped and maintained in an ongoing fashion by their environment and that appropriate social behavior is established through *social environments* that prompt and reinforce such behavior each day, in each setting.

### Notes

1. The schedule of lessons across grades varied because grade-level inner-school teams were given autonomy in deciding the schedule of lessons during the first 10 weeks of school.

2. The student surveys were not obtained during the baseline phase for 6th or 8th graders in the comparison community because the 7th grade students were the only cohort to stay in the same school between May and September of that year. Sixth graders were moving from the Intermediate School to the Middle School and 8th graders were moving to the High School. Thus, no valid pre-post intervention comparison was possible for any cohort other than 7th graders.

3. Combining all forms of recorded tangible reinforcers yielded odds of receiving a tangible reinforcer of approximately 13% on any given day. Clearly, if student survey reports are accurate (52-60% reported receiving praise or reward on the previous day), the majority of positive reinforcement was given in the form of verbal or nonverbal praise. A series of classroom observations in the Fall of 1996 validates this assumption, as students were generally receiving approving statements and praise from the

teachers in the classroom on a routine basis. Furthermore, the EBS intervention encouraged teachers to increase their rate of praise in addition to increasing the use of tangible reinforcers.

4. In Hawkins and colleagues' (Hawkins & Hursh, 1992; Hawkins & Mathews, 1999) classification of the three levels of research, Level 3 is rigorously scientific, controlled evaluation necessary for establishing cause and effect, Level 2 is less rigorous scientific evaluation for evaluating procedures and programs, and Level 1 is non-scientific program evaluation research necessary for accountable service delivery.

### References

- Adams, L., & Russakoff, D. (1999). Dissecting Columbine's cult of the athlete. *The Washington Post*, June 12, p. A01.
- Ary, D. V., Duncan, T. E., Biglan, A., Metzler, C. W., Noell, J. W., & Smolkowski, K. (1999). Development of adolescent problem behavior. *Journal of Abnormal Child Psychology*, 27, 141-150.
- Ary, D. V., Duncan, T. E., Duncan, S. C., & Hops, H. (1999). Adolescent problem behavior: The influence of parents and peers. *Behaviour Research and Therapy*, 37, 217-230.
- Barlow, D. H., Hayes, S. C., & Nelson, R. O. (1984). *The scientist practitioner: Research and accountability in clinical and educational settings*. NY: Pergamon Press.
- Bickel, W. E., & Hattrup, R. A. (1995). Teachers and researchers in collaboration: Reflections on the process. *American Educational Research Journal*, 32, 35-62.
- Biglan, A. (1995). *Changing cultural practices: A contextualist framework for intervention research*. Reno, NV: Context Press.
- Biglan, A., Ary, D. V., & Wagenaar, A. C. (in press). The value of interrupted time-series experiments for community intervention research. *Prevention Research*.
- Bullis, M., & Walker, H. M. (1993). Characteristics, causal factors, and school-based interventions for children and adolescents with antisocial behavioral disorders. In L. Meyer (Ed.), *Issues and Research in Special Education*. New York: Teachers College Press.
- Colvin, G., & Sprick, R. (1996). Providing administrative support for school improvement plans. Unpublished manuscript. Eugene, OR: College of Education, University of Oregon.
- Colvin, G., Sugai, G., & Patching, W. (1993). Precorrection: An instructional approach for managing predictable problem behaviors. *Intervention in School and Clinic*, 28, 143-150.
- Colvin, G., Wilbanks, D., Borg, J., Dickey, C., Duncan, M., Gilmore, M., Henery, J., & Shaw, S. (1996). Establishing an effective school-wide discipline plan: Getting all staff on board. *The Oregon Conference Monograph*, 8, 93.
- Committee for Children. (1990). *Second Step: A violence prevention curriculum*. (ERIC Document Reproduction Service No. ED 365 742). Seattle, WA: Committee for Children.
- Committee for Children. (1996). Prevention update. *Newsletter of the Committee for Children*, January. Seattle, WA: Committee for Children.
- Crosbie, J. (1993). Interrupted time-series analysis with brief single-subject data. *Journal of Consulting and Clinical Psychology*, 61, 966-974.
- Crosbie, J. (1995). Interrupted time-series analysis with short series: Why it is problematic; how it can be improved. In J. M. Gottman (Ed.), *The analysis of change*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Crowe, T. (1991). *Habitual juvenile offenders: Guidelines for citizen action and public responses*. Washington, D.C.: Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.

- Donovan, J. E., & Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology, 53*, 890-904.
- Donovan, J. E., Jessor, R., & Costa, F. M. (1988). Syndrome of problem behavior in adolescence: A replication. *Journal of Consulting and Clinical Psychology, 56*, 762-765.
- Elliott, D. (1994). *Youth violence: An overview*. Boulder, CO: Center for the Study and Prevention of Violence, University of Colorado.
- Embry, D. D., Flannery, D. J., Vazsonyi, A. T., Powell, K. E., & Atha, H. (1996). Peacebuilders: A theoretically driven, school-based model for early violence prevention. *American Journal of Preventive Medicine, 12* (Supplement 2), 91-100.
- Embry, D. D. (1997). Does your school have a peaceful environment? Using an audit to create a climate for change and resiliency. *Intervention in School and Clinic, 32*, 217-222.
- Englert, C. S., Tarrant, K. L., & Rozendal, M. S. (1993). Educational innovations: Achieving curricular change through collaboration. *Education and Treatment of Children, 16*, 441-473.
- Flannery, B. K., Sprague, J. R., & Todd, A. (1996). Including students with behavioral challenges: Blending school-wide discipline and individual supports. In L. Power-deFur & F. P. Orellove (Eds.), *Inclusive schools: A comprehensive guide to successful implementation* (pp. 227-244). Gaithersburg, MD: Aspen Publishing.
- Furlong, M. J. (1994). Evaluating school violence trends. *National School Safety Center News Journal, 3*, 23-27.
- Gottfredson, D. C., Gottfredson, G. D., & Skroban, S. (1998). Can prevention work where it is needed most? *Evaluation Review, 22*, 315-340.
- Hawkins, R. P. & Hursh, D. E. (1992). Levels of research for clinical practice: It isn't as hard as you think. *The West Virginia Journal of Psychological Research and Practice, 1*, 61-71.
- Hawkins, R. P. & Mathews, J. R. (1999). Frequent monitoring of clinical outcomes: Research and accountability for clinical practice. *Education and Treatment of Children, 22*, 117-135.
- Howell, J. (1995). *Guide for Implementing a Comprehensive Strategy for Serious, Violent and Chronic Juvenile Offenders*. Washington, D.C.: Office of Juvenile Justice and Delinquency Prevention.
- Johnson, D. B., Malone, P. J., & Hightower, A. D. (1997). Barriers to primary prevention efforts in the schools: Are we the biggest obstacle to the transfer of knowledge? *Applied and Preventive Psychology, 6*, 81-90.
- Kameenui, E. J., & Simmons, D. C. (1990). *Designing instructional strategies: The prevention of academic learning problems*. Columbus, OH: Merrill Publishing.
- Linney, J. A., & Seidman, E. (1989). The future of schooling. *American Psychologist, 44*, 336-340.
- Mayer, G. R. (1995). Preventing antisocial behavior in the schools. *Journal of Applied Behavior Analysis, 28*, 467-478.
- 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*(4), 355-369.
- Mayer, G. R., Mitchell, L. K., Clementi, T., & Clement-Robertson, E. (1993). A dropout prevention program for at-risk high school students: Emphasizing consulting to promote positive classroom climates. *Education and Treatment of Children, 16*, 135-146.
- Mills, R. F., & Pollak, J. P. (1993). Collaboration and teacher change in the middle school. *The Clearing House, 66*, 302-304.
- National School Safety Center (Ed.). (1996). *National School Safety Center Newsletter, March*. Malibu, CA: National School Safety Center: Author.
- Olweus, D. (1992). Bullying among schoolchildren: Intervention and prevention. In R. D. Peters, R. J. McMahon, & V. L. Quincy (Eds.), *Aggression and violence throughout the life span* (pp. 100-125). Newbury Park, CA: Sage Publications.
- Olweus, D. (1993). *Bullying at school: What we know and what we can do*. Oxford: Blackwell.
- Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. *American Psychologist, 44*, 329-335.



- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *Antisocial boys: A social interactional approach*, Vol. 4. Eugene, OR: Castalia Publishing Company.
- Ponti, C. R., Zins, J. E., & Graden, J. L. (1988). Implementing a consultation-based service delivery system to decrease referrals for special education: A case study of organizational consideration. *School Psychology Review*, 17, 89-100.
- Roth, J. A. (1994). Understanding and preventing violence. *National Institute of Justice Research in Brief* (February) Washington, D.C., Office of Justice Programs, U. S. Department of Justice.
- Smylie, M. (1988). The enhancement function of staff development: Organizational and psychological antecedents to individual teacher change. *American Educational Research Journal*, 25, 1-30.
- Sparks, G. M. (1988). Teachers' attitudes toward change and subsequent improvements in classroom teaching. *Journal of Educational Psychology*, 80, 111-117.
- Sprague, J., Sugai, G., & Walker, H. (1998). Antisocial behavior in schools. In S.M. Watson & F.M. Gresham (Eds.), *Handbook of child behavior therapy* (pp. 451-474). New York, NY: Plenum Press.
- Sugai, G., & Horner, R. H. (1994). Including students with severe behavior problems in general education settings: Assumptions, challenges, and solutions. In J. Marr, G. Sugai, & B. Tindal (Eds.), *The Oregon Conference Monograph, Volume 6* (pp. 102-120). Eugene, OR: College of Education, University of Oregon.
- Sugai, G., & Tindal, G. A. (1993). *Effective school consultation: An interactive approach*. Pacific Grove, CA: Brooks/Cole.
- Taylor-Greene, S., Brown, D., Nelson, L., Longton, J., Gassman, T., Cohen, J., Swartz, J., Horner, R. H., Sugai, G., & Hall, S. (1997). School-wide behavioral support: Starting the year off right. *Journal of Behavioral Education*, 7, 99-112.
- Tobin, T., Sugai, G., & Colvin, G. (1996). Patterns in middle school discipline records. *Journal of Emotional and Behavioral Disorders*, 4, 82-94.
- Walker, H. M. (1995). *The acting-out child: Coping with classroom disruption* (2<sup>nd</sup> edition). Longmont, CO: Sopris West.
- Walker, H. M., Colvin, G., & Ramsey, E. (1995). *Antisocial behavior in school: Strategies and best practices*. Pacific Grove, CA: Brooks/Cole Publishing Co.
- Walker, H. M., Horner, R. H., Sugai, G., & Bullis, M. (1996). Integrated approaches to preventing antisocial behavior patterns among school-age children and youth. *Journal of Emotional and Behavioral Disorders*, 4, 194-209.
- Walker, H. M., Irvin, L. K., & Sprague, J. R. (1997). *Violence prevention and school safety: Issues, problems, and recommended solutions* (OSSC bulletin v. 41, no. 1). Eugene, OR: Oregon School Study Council.
- Wilson, J., & Howell, J. (1993). *A comprehensive strategy for serious, violent, and chronic juvenile offenders*. Washington, D.C.: Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.
- Witt, J. C., Martens, B. K., & Elliott, S. N. (1984). Factors affecting teachers' judgments of the acceptability of behavioral interventions: Time involvement, behavior problem severity, and type of intervention. *Behavior Therapy*, 15, 204-209.
- Witt, J. C., & Martens, B. K. (1988). Problems with problem-solving consultation: A re-analysis of assumptions, methods, and goals. *School Psychology Review*, 17, 211-226.
- Wright, J. A., & Dusek, J. B. (1998). Compiling school base rates for disruptive behaviors from student disciplinary referral data. *School Psychology Review*, 27, 138-147.