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This article addresses the generalizability of research showing that certain preventive interventions reduce youth involvement in undesirable behaviors. A middle school with multiple organizational problems attempted to implement a comprehensive prevention program aimed at increasing social competencies, social bonding, and school success using program components that had been demonstrated in prior research to reduce problem behavior. The program never reached the expected levels of implementation, and no dependable effects on youth behaviors or attitudes were observed. The results are placed in the context of research that has repeatedly shown that prevention programs work best in amenable settings.

CAN PREVENTION WORK WHERE IT IS NEEDED MOST?

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The slogan “prevention works” has replaced the “nothing works” pessimism of the 1970s about delinquency programs. Recent reviews (Botvin 1990; Brewer et al. 1995; Dryfoos 1990; Durlak 1995; Eron, Gentry, and Schlegel 1994; Gottfredson, Sealock, and Koper 1996; Hansen 1992; Hansen and O’Malley 1996; Hawkins, Arthur, and Catalano 1995; Institute of Medicine 1994; Schinke, Botvin, and Orliandi 1991; Tobler 1992; Weissberg and Greenberg in press) summarize a growing literature demonstrating that sound prevention practices can reduce later youth involvement in a range of unde-

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sirable behaviors, including substance abuse, premature sexual activity, and criminal activity. A burgeoning number of government publications (Center for Substance Abuse Prevention 1994; Office for Substance Abuse Prevention 1991; National Institute on Drug Abuse 1997; Office of Educational Research and Improvement 1992; Office of Juvenile Justice and Delinquency Prevention 1995) and how-to books (Hawkins, Catalano, and Associates 1992; Howell et al. 1995) draw on this literature to promote broader application of tested intervention models. This article addresses the generalizability of the positive outcomes of prevention research. It explores the extent to which results from carefully conducted studies of well-designed and well-implemented prevention trials generalize to more common arrangements in which programs are put in place in schools.

This issue is important because scientific studies demonstrating effectiveness are used to sway public opinion about the efficacy of prevention and to direct federal, state, local, and foundation money toward effective prevention programs and practices. The U.S. Department of Education, for example, has recently revised its guidelines for allocating the \$500 million per year spent in the Safe and Drug-Free Schools and Communities Program so that local funds are spent to support programs for which scientific evidence of a reduction in drug use, violence, or disruptive behavior among youth is available. To the extent that the research base for this and similar policies fails to generalize to more common prevention settings, the public will again be asked to admire the emperor's new clothes.

The issue of generalizability of outcome research findings is not new. Rossi and Freeman (1989, 267) raised concerns about generalizing results from programs administered by highly dedicated and skillful researchers to lay workers who may lack the same commitment and skill, and from programs operated in amenable settings to those run in environments less tractable than those studied. Results of meta-analysis imply that variability in program effects is somewhat predictable. Lipsey's (1992) meta-analysis of 443 juvenile delinquency prevention and treatment programs found that, although program effects overall were small, programs run by researchers and programs that provided larger "dosage" of whatever the program delivered were associated with larger effects.

The generalizability of prevention study outcomes are explored in this article in the context of a case study of a comprehensive, school-based, instructional and social competency promotion program in an urban middle school with multiple organizational problems. The program included components aimed at increasing social competencies, social bonding, and school success—each of which is correlated with later delinquency or substance use among adolescents. Most components used in the program had been demon-

strated in prior research to reduce problem behavior or its correlates. This study tested the transportability of these interventions into a more comprehensive program that could be implemented in a natural school setting as part of a school-based prevention demonstration.

THE PREVENTION PROGRAM

ORIGINS

The program was developed as part of a districtwide school reform effort (Gottfredson and Gottfredson 1990). We worked with a team of district-level administrators and school-level educators appointed by the superintendent to develop a long-range and comprehensive plan to increase the district's high school completion rates by the year 2001. One of several objectives of the district plan was to reduce counterproductive student behaviors that are precursors of school dropout—including drug and alcohol use, delinquent behavior, pregnancy, nonattendance, and misconduct in school. A subcommittee of the task force (composed of school system administrators, teachers, and the first two authors) supported the development of an application to the Office for Substance Abuse Prevention (later renamed the Center for Substance Abuse Prevention, or CSAP) to demonstrate a substance abuse and other problem behavior prevention program in one of the school system's middle schools. The school selected for the demonstration had worked previously with the researchers on a successful discipline management effort (Gottfredson, Gottfredson, and Hybl 1993), and its assistant principal had been active on the district subcommittee that encouraged the project.

PROGRAM RATIONALE

The centerpiece of the program was an emphasis on social competency development. A large body of basic research (summarized by Gottfredson et al. in press) has established a correlation between social competency skills and various forms of problem behavior across the age span. Gottfredson and Hirschi (1990) have integrated this extensive literature in a simple general theory of low self-control as a stable trait useful in the explanation of a variety of forms of crime and other problem behavior. Bandura's theory (1982) also emphasizes the importance of social-cognitive styles for explaining many behavioral outcomes.

A number of programs to promote social competency have been developed and tested. These programs focus on developing a range of cognitive and behavioral skills necessary to cope with social challenges and integrate feelings, thinking, and actions to achieve specific goals. These skills include encoding relevant social cues; accurate interpretation of encoded social cues; generation of effective solutions to interpersonal problems; realistic anticipation of consequences of, and potential obstacles to, one's actions; translation of social decisions into effective behavior; and expression of a positive sense of self-efficacy (Elias et al. 1994). Perhaps most important, these programs incorporate training for youths to stop when signs of an impending problem are recognized.

Studies of the efficacy of social competency promotion programs with early adolescents have demonstrated positive effects on problem-solving skills, prosocial attitudes, impulse control, sociability, delinquent behavior, and intentions to use alcohol and other drugs according to peer ratings, teacher ratings, and self-reports (Caplan et al. 1992; Weissberg and Caplan 1994; Weissberg and Jackson 1993). Such programs have also been demonstrated in meta-analyses to be among the most effective approaches to delinquency and substance abuse prevention (Garrett 1985; Izzo and Ross 1990; Lipsey 1992).

The theory underlying the program also implied that increased social bonding and school success would reduce subsequent problem behaviors. These personal characteristics have been linked in theory and research to problem behavior. Social control theory (Hirschi 1969) implies that weak bonds to the social order leave a person unrestrained from engaging in self-gratifying behaviors (e.g., delinquency, drug use). These bonds include attachments to school or parents, belief in the validity of laws and rules, and commitment to education or occupation. When these bonds are strong, the individual is restrained from misbehavior because he or she has much to lose. Ample research relates measures of these three bond elements to substance use (Gottfredson and Koper 1996; Jessor, Donovan, and Widmer 1980; Smart and Feger 1971) and delinquent behavior (Gottfredson 1984a; Hirschi 1969).

Youths who are successful in school are more likely to refrain from misbehavior than are their less successful peers. Poor school grades have been shown to be related to self-reported delinquent behavior (Bachman 1975), having a police record (Hirschi and Hindelang 1977), engaging in serious juvenile delinquency (Rhodes and Reiss 1969), and drug use (Jessor 1976; Kandel, Kessler, and Margulies 1978; Smith and Fogg 1978).

Accordingly, the program's theory of action (Gottfredson 1984b) called for program components to increase social competency, promote attachment and commitment to school, and increase success in academic tasks.

PROGRAM COMPONENTS

The program began during the 1991-1992 school year, and the set of intervention strategies evolved over the course of the project to take account of local conditions and to strengthen implementation. For example, a community apprenticeship component aimed at increasing commitment to education for high-risk youths was dropped when it proved too difficult for school personnel to find employers for this group. Also, several of the instructional components initially delivered in study halls or by insertion in other classes were combined into an Education and Life Focus (ELF) class first delivered during the 1993-1994 school year. Persistent difficulties in scheduling students into study halls and other classes to receive the various components of the program led to a decision to incorporate all classroom-based components into the ELF course. Approximately one third of the students in the school were to be scheduled into the course each trimester, so that all students received it by the end of the year. The following paragraphs describe the components implemented in the final two years of the program, after the components had stabilized and the ELF class had begun.

Social competency promotion components. The social competency promotion components all focused on developing the cognitive-behavioral skills shown in prior research to be related to problem behavior. They shared a common reliance on behavioral modeling and cognitive self-management techniques, and each focused on helping youths recognize potential problems, exercise self-restraint, assess consequences, and make and carry out plans to achieve desired outcomes. Whereas most of the selected social competency modules emphasized social problem solving, two modules—Career Exploration and Decision Skills (CEDS) and Cognitive Self-Instruction (CSI)—emphasized the behavioral and cognitive skills necessary for making good educational decisions and for good academic performance. The following social competency promotion components were delivered in sequence in the ELF class.

Life Skills Training (LST) (Botvin 1989) was implemented in the ELF class at each grade level. This component was delivered to all sixth graders. LST has been shown in a rigorous test (Botvin et al. 1990) to reduce smoking and marijuana use among White youths in grades seven to nine. Additional research (Botvin, Batson, et al. 1989; Botvin, Dusenbury, et al. 1989) showed that the positive effects generalize to African American and Hispanic American populations. Because research by Botvin, Renick, and Baker (1983) suggested that the effects of the program are sustained better when booster lessons are delivered in successive years, boosters were provided in each of the seventh- and eighth-grade ELF classes.

A Social Problem-Solving course (SPS) (Weissberg et al. 1990) was used in all seventh-grade ELF classes. Studies of the efficacy of this social competency promotion program with early adolescents have demonstrated positive effects on problem-solving skills, prosocial attitudes, impulse control and sociability, delinquent behavior, and intentions to use drugs and hard liquor according to peer ratings, teacher ratings, and self-reports (Caplan et al. 1992; Weissberg and Caplan 1994; Weissberg and Jackson 1993).

A violence prevention curriculum based on Slaby and Guerra's Viewpoints program (Guerra and Slaby 1990) was provided in all eighth-grade ELF classes. Viewpoints is a social skills training program that teaches the skills necessary to successfully resolve problem situations. It focuses on using social skills to avoid alcohol, tobacco, and other drug use; aggression and violence; and other problem behavior. Guerra and Slaby (1990) showed that a 12-session Viewpoints program increased skill in solving problems and identifying problem situations and reduced aggressive, impulsive behavior among a delinquent population. This program was adapted for middle school application.

Manning's (1991) elementary school model for teaching students skills to regulate their own learning was the basis for the development of a Cognitive Self-Instruction (CSI) component. CSI teaches students to define the problem to work on, focus their attention, guide themselves through the activity, cope with negative thoughts, and reinforce themselves for progress. Manning (1988) demonstrated that teaching elementary school-aged students these skills resulted in increased self-efficacy, more on-task behavior, and more positive teacher ratings of classroom behavior. Curriculum was written for middle school students (Rice and Fink 1994) and was integrated into the sixth-grade ELF curriculum.

A Career Exploration and Decision Skills component (Gottfredson 1994) aimed at introducing careers, educational requirements for careers, and teaching planning skills was developed for inclusion in the eighth-grade ELF course. The curriculum focused on a planning structure and included sessions on assessing vocational interests, values, understanding the educational requirements of different jobs, gathering occupational information, the pros and cons of career alternatives, developing an educational plan, and selecting high school courses. A four-lesson sequence from the Idaho Comprehensive Guidance and Counseling Program (Block and Mollerup 1992)—primarily aimed at increasing commitment to education rather than building social competency skills—was also included in the sixth-grade ELF course.

The following table summarizes the social competency promotion elements of the ELF class provided at each grade level.

TABLE 1: Education and Life Skills (ELF) Course Social Competency Skill Content

<i>Component</i>	<i>Grade 6</i>	<i>Grade 7</i>	<i>Grade 8</i>
Cognitive Self-Instruction	10 lessons	—	—
Career Exploration and Decision Skills	4 lessons ^a	—	10 lessons
Life Skills Training	16 lessons	8 lessons	8 lessons
Social Problem Solving	—	27 lessons	—
Viewpoints	—	—	16 lessons

a. Primarily career exploration.

Academic and social bonding components. In addition to the ELF class that focused on social competency promotion, three additional strategies were implemented. Instructional improvement interventions included schoolwide changes in instruction and individually targeted tutoring. Cooperative Learning (CL) techniques (Johnson and Johnson 1989; Slavin, Madden, and Stevens 1990), which make use of small heterogeneous learning teams to promote learning and school attachment, were to be used schoolwide. Research at various grade levels and in numerous content areas has documented the effectiveness of CL for increasing academic achievement, attachment to school, and improved relations among different groups of students (Sharan 1980; Slavin 1980, 1983a, 1983b). To promote the use of CL, all students were introduced to cooperative learning techniques in a series of lessons written by one of the school's teachers and included in the ELF classes at each grade level.

One-on-one tutoring was provided by adult volunteers and students from local colleges. Tutoring has been shown to be effective for increasing academic performance (Glass and Smith 1979), and some research has shown it to be effective for increasing social competency, as measured by reduced peer rejection (Coie and Krehbiel 1984). This service was intended only for students identified (using procedures described below) as at high risk. About half of the high-risk students were to receive regular tutoring throughout the school year.

Mentors provided prosocial adult models who were supportive and encouraged appropriate behaviors. School-based mentoring programs may increase school attendance if well implemented (McPartland and Nettles 1991). A recent study of a program that paired elderly mentors with high-risk sixth-grade students demonstrated positive effects on attitudes toward school, school attendance, community service, knowledge about and attitudes toward elderly people, and reactions to situations involving drug use, and demon-

strated a marginally significant reduction in the frequency of substance use (LoSciuto et al. 1996). And an exceptionally well-executed study (Tierney, Grossman, and Resch 1995) also showed that a highly structured Big Brother/Big Sister community-based mentoring model increased attendance and reduced substance use. The generalizability of this highly structured mentoring model to other school-based mentoring programs has not been established. In the present study, high-risk students were paired with teachers in the school who had volunteered to serve as "Academic God Parents." Mentor-student relations often involved tutoring, monitoring student progress, and sharing recreational activities.

For each program component, researchers and implementers jointly specified implementation standards (Gottfredson 1984b). These are quantitative indicators of the strength or intensity of program implementation—or student exposure—expected. In general, they express (a) goals for quality of implementation and (b) an expectation about the level of implementation required for program effectiveness. Manuals provided by program component developers and prior research were consulted during the development of these standards. They were established to provide a benchmark against which implementation success could be gauged. Table 2 shows the implementation standards set for each component.

ARRANGEMENTS FOR IMPLEMENTATION

A team consisting of project staff paid by the grant (a counselor, teacher, aide, and record clerk hired by the school to implement the program) and eventually three of the school's existing teachers implemented the project. Other school staff were informed of the program, its progress, and any expectations regarding their role in the project in faculty meetings, one full-faculty in-service training session, several more intensive training sessions for specific program components, and infrequent (two or three times per year) visits to the school by the researchers. Data feedback on program implementation were generally presented to the small team consisting of the researchers, the project counselor and teacher, and occasionally one or two other teachers heavily involved with the program. This smaller group developed standards for implementation and made program decisions. The principal was usually not involved in detailed aspects of program review and planning, although she was always involved in major program decisions, such as arrangements for instructional delivery, afterschool activities, and so on.

TABLE 2: Implementation Standards for Each Program Component

<i>Component</i>	<i>Implementation Standard</i>
Cognitive Self-Instruction, Life Skills Training, and Viewpoints	95% of all students complete at least 88% of the assignments.
Career Exploration and Decision Skills	Grade 6: 85% of sixth-grade students complete at least 82% of the assignments. Grade 8: All eighth-grade students complete Lessons 1 through 7. Of these, 85% satisfactorily complete at least 18 (82%) of the 22 assignments.
Social Problem Solving	95% of all students complete at least 80% of the assignments.
Cooperative Learning	All reading teachers and half of the English, math, social studies, and science teachers use cooperative learning methods at least 4 days per week in at least one classroom period for at least 6 weeks per semester.
Tutoring	Half of the students identified as high risk receive 1 hour of tutoring per week.
Mentoring	Fifty students identified as high risk participate in the mentoring program. Thirty-five of these students meet at least once per week for at least half an hour with their mentor. Three fourths of the meetings are one-on-one and involve mutually agreed-upon activities.

THE SETTING

A middle school, Bradley, was selected by district administrators as the site for the demonstration project. The school had worked previously with the researchers on a successful discipline management effort (Gottfredson, Gottfredson, and Hybl 1993), and its assistant principal had been active on the district subcommittee and was extremely supportive of the project. Bradley had an enrollment of approximately 800 students and served a predominantly residential, lower middle-class area. The attendance area for the school experienced a major demographic shift beginning in the late 1980s. The student population began a gradual but steady shift from a 50-50 Black-White split in 1988 to majority Black (75%) during the 1994-1995 school year. A similar shift was seen in the socioeconomic status of the student population during this time period. The percentage of students receiving free or reduced lunch increased from 60% in 1990-1991 to 75% in 1994-1995. The student population was exceptionally transient due to a nearby naval

base—typically, between 20% and 30% of the students ever enrolled in a given year either enrolled after the start of the school year or left the school before the end of the year. Students also suffered educational disadvantage: 58% of Bradley's students in 1988-1989 were overage for their grade, primarily due to greatly increased grade retention rates that occurred districtwide after the school board imposed strict promotion standards in response to 1984 state educational reform legislation. Finally, in the 1988-1989 school year, Bradley's suspension rate was 99 per 100 students. The high suspension rate, evidence of unusual discipline problems in the school, was a large factor in Bradley's selection as the demonstration school.

METHODS

We report only results of an assessment of the strength and fidelity of program implementation in this report. Results of an outcome evaluation using a nonequivalent comparison group design are briefly summarized here and reported in detail in a technical report (Gottfredson, Gottfredson, and Skroban 1996). The following paragraphs describe the subjects and how implementation was measured.

SUBJECTS

Most program components targeted all students in Bradley. But tutoring and mentoring services, which were more resource intensive than the instructional components, were reserved for "high-risk" students. For these services, we identified approximately 10% of each school's population as at elevated risk for substance use each year. These students were selected on the basis of teacher ratings of behavior, grades, attendance, suspensions, and age. A linear composite weighted each of these five predictors of problem behavior equally, and highest scoring students were selected for intervention. Because selection was based on data from teachers and school records from the prior school year, students who were new to the school (e.g., incoming sixth graders and students transferring in) were not eligible for selection in their first year. High-risk students were retained in the sample and were provided services as long as they were enrolled at Bradley. Each year, additional students were selected (using the same procedure) to replace those students who left the school.

MEASURES

An implementation log was created for each lesson delivered as part of the ELF class. These logs included each of the activities to be conducted and main points to be made by the instructor. Logs were completed by the teacher or by a teacher's aide (provided by the project) following each lesson. In addition to the logs, completion of major assignments was recorded for each student. For non-ELF course components, teachers or tutors filled out mentoring logs, tutoring logs, and cooperative learning logs after each service episode.

All logs and attendance forms were submitted by the teachers or tutors to an on-site data clerk who entered the information into a computerized database developed for this purpose. Data from these records were summarized by the researchers three times per year, and information on level of implementation was fed back to the program implementers. This feedback on program implementation and discussions about obstacles encountered during implementation were intended to improve the program over the course of the project.

Information from these sources is reported below as percentages of the intended population who received the program and percentages of intended level of intensity. Students are counted as having received an intervention component if program records indicated that they completed at least one of the assignments related to the component. The number receiving each component is expressed as a percentage of all students targeted for the component. Intensity percentages are the average number of assignments completed by students who completed at least one assignment expressed as a percentage of the number of assignments intended. For example, if 10 assignments were expected to be completed as part of the SPS course and the average student who participated in SPS completed 7, 70% intensity is reported. The standards described earlier varied somewhat from component to component but called for at least 85% of the targeted students to complete at least 80% of assignments.

RESULTS

Tables 3 and 4 summarize data on the number of persons receiving each component during each of the last two school years of the project.¹ Table 3 shows the number and percentage of intended students who completed at least

TABLE 3: Level of Implementation of Program Components—1993-1994

<i>Component</i>	<i>Target Group</i>	<i>Number Received</i>	<i>Intensity Level</i>
Cooperative Learning	All teachers	45 teachers (88%)	63%
Tutoring	High-risk students	26 students (19%)	5.2 sessions/year
Mentoring	High-risk students	59 students (42%)	21.2 contacts/year
Cognitive Self-Instruction	Grade 6	141 students (37%)	97%
Career Exploration	Grade 6	244 students (64%)	81%
Life Skills Training			
Level 1	Grade 6	263 students (69%)	84%
Life Skills Training			
Level 2	Grade 7	150 students (43%)	83%
Social Problem Solving	Grade 7	195 students (56%)	50%
Life Skills Training			
Level 3	Grade 8	151 students (50%)	90%
Career Exploration and Decision Skills	Grade 8	147 students (49%)	65%
Viewpoints	Grade 8	77 students (26%)	70%

NOTE: Percentages are of target population.

one assignment for each component in the 1993-1994 school year and the percentage of the intended number of assignments completed by these students. The social competency components targeting sixth-grade students—CSI, CEDS, and LST—were delivered with reasonable intensity (97%, 81%, and 84%, respectively), but did not reach as many of the sixth graders as expected (37%, 64%, and 69%, respectively). The components targeting seventh graders—LST and SPS—also did not reach the expected number of students (43% and 56%, respectively). LST was delivered with reasonable fidelity to the intended program (84%), but SPS was not (50%). The components for eighth-grade students—LST, CEDS, and Viewpoints—reached only 50%, 49%, and 26%, respectively, of the intended population, with variable intensity. Again, LST was delivered with the highest intensity level (90%), but CEDS (65%) and Viewpoints (70%) were lower than anticipated. In short, each of the ELF course social competency skill components fell short of the standards that had been set for its implementation, primarily because students were not scheduled in to the ELF course or did not participate in ELF course activities while in the class. In other cases (e.g., SPS), the delivery of the course was also incomplete.

The tutoring component proved cumbersome to administer because it involved careful scheduling of individual students with individual tutors. Only 19% of the high-risk students received any tutoring, and the average number of sessions for those tutored was five sessions for the entire year. The

TABLE 4: Level of Implementation of Program Components—1994-1995

<i>Component</i>	<i>Target Group</i>	<i>Number Received</i>	<i>Intensity Level</i>
Cooperative Learning	All teachers	39 teachers (80%)	58%
Tutoring	High-risk students	42 students (32%)	3.8 sessions/year
Mentoring	High-risk students	52 students (40%)	18.8 contacts/year
Cognitive Self-Instruction	Grade 6	40 students (13%)	— ^a
Career Exploration	Grade 6	76 students (28%)	— ^a
Life Skills Training Level 1	Grade 6	319 students (97%)	75%
Life Skills Training Level 2	Grade 7	175 students (46%)	66%
Social Problem Solving	Grade 7	242 students (69%)	55%
Life Skills Training Level 3	Grade 8	79 students (31%)	60%
Career Exploration and Decision Skills	Grade 8	154 students (63%)	53%
Viewpoints	Grade 8	195 students (77%)	66%

NOTE: Percentages are of target population.

a. Information not available.

mentoring component reached 42% of the high-risk students, with an average of 21 sessions per mentored student. The mentoring component was implemented with far greater fidelity to the plan than the tutoring program, but still fell short of expectation. It was anticipated that students would meet with their mentors at least once per week for the entire school year. The CL component was especially well-implemented: 88% of the teachers used these techniques at about 63% of the expected intensity level. In summary, implementation improved with the creation of the ELF class, but by the end of the 1993-1994 school year, the program was still not being implemented with the expected strength.

The same program components were implemented during the 1994-1995 school year, the final year of implementation. The number and percentage of intended students who actually received each component and the intensity levels are shown in Table 4. Several components—Viewpoints, SPS, LST for Grade 6, CEDS for Grade 8, and tutoring—improved over the previous year in terms of the percentage of the population reached. The remaining sixth-grade components (Career Exploration and CSI) were de-emphasized, whereas LST was implemented with considerable strength—97% of the sixth-grade students received the program at a 75% intensity level. SPS reached 69% of the seventh graders, but only at 55% intensity. The improved level of implementation for Viewpoints (77% of eighth-grade students at 66%

intensity) appears to have been at the expense of LST, which reached only 31% of the intended students. Generally, the intensity of the program delivery declined in the last year. For example, the CEDS Grade 8 component slipped from 65% of lessons completed in 1993-1994 to 53% completed in 1994-1995. Mentors met with their students about 2.5 fewer times during the year, and the schoolwide CL intervention deteriorated. Although 80% of teachers tried these strategies, they used them less frequently. The final year of the program was somewhat stronger than the previous year in terms of the number of students reached at all, but the large boost in implementation intensity expected as the ELF class became routinized was not observed. The intensity of most interventions declined from the previous year.

In summary, the program was not implemented according to the initial expectations of the team that had developed the proposal for the project. Although most components of the program were delivered at some point in some way, the program was still in considerable flux by the end of the 5-year project period.

OUTCOMES

Gottfredson, Gottfredson, and Skroban (1996) reported the results of the outcome evaluation for the project. The study examined change over the 5-year program period on measures of problem behavior and antisocial attitudes, positive school adjustment, and school attendance as a function of (a) membership in the treatment school (as opposed to a neighboring school used as a comparison school) and (b) participation in each of the program components within Bradley. The results showed that the prevention demonstration program, despite its grounding in social science theory and research, failed to reduce substance use, any other form of problem behavior, or any of the measured predictors of these problem behaviors.

DISCUSSION

The program components in our study were not implemented in as strong a fashion as they were in much of the original research on the components. Guerra and Slaby (1990) reported that graduate students delivered their violence prevention curriculum after receiving extensive formal training (16 hours) provided by the program developer. The students received ongoing (30 minutes per week) face-to-face technical assistance from the developer during the implementation of the program. Caplan et al. (1992) reported

master's-level health educators from a university-based community agency co-taught their social problem-solving curriculum with classroom teachers after receiving training (six 2-hour sessions) from the developer. Weekly on-site consultation was also provided by the developers. Weissberg and Caplan (1994) reported that classroom teachers implemented the program with assistance from undergraduate aides and that extensive training (ten 90-minute workshops) was provided by the program developers. On-site consultation and coaching was also provided by the research staff.

Botvin, Renick, and Baker (1983) reported positive program effects for the LST program when teachers in suburban New York schools implemented the curriculum after a 1-day training session. In that study, project staff were available to consult with teachers whenever necessary, and extensive implementation monitoring mechanisms were applied to "assure that the LST Program was being properly implemented" (p. 363). It appears that when the program developers are actively involved in the implementation of the program, positive effects are often observed. Lipsey's (1992) extensive meta-analysis of prevention and treatment programs also found that programs delivered by researchers were more effective than those delivered by the typical practitioner, presumably because researchers attended more to issues of strength and integrity of program implementation. Tobler's (1992) meta-analysis of substance abuse prevention programs likewise showed that among the top 10 most effective programs identified in the literature, only 1 was implemented by regular classroom teachers, and that program was unusual because extraordinary amounts of training and consultation were provided for the teachers.

It is not possible to compare directly the intensity of implementation of components in our study with the intensity levels reported in previous studies, but comparisons with our own implementation standards established for each component are possible. The quantitative standards set prior to implementation were shown earlier. The percentage of targeted students actually achieving the standards set for each component ranged from 0% (for tutoring and SPS) to 67% (for Grade 6 LST), with a mean of 28% across all components during the 1993-1994 school year.

These obvious differences in the types of delivery personnel, training, and coaching most likely account for some of the differences in effects observed in ours and prior studies. It is possible that more positive results would have been obtained simply by providing more training for the implementing teachers. Although the level of teacher training was generally less than had been provided in prior research, it *exceeded* customary school district practice by a large measure.

Research by Botvin et al. (1990) directly addressed the effect of amount of training on strength of implementation of the LST program. They compared the effectiveness of two different training mechanisms for teachers implementing the LST program: One involved a 1-day training session and implementation feedback to teachers. The other involved a 2-hour videotape accompanied by written instructions and curriculum materials, with no implementation feedback. The quality of implementation was similar in each condition, with a mean of 67% and 68% of the material covered in each condition—comparable to what was achieved in this study. The amount of material covered ranged from 27% to 97%, with only 75% of the students in either experimental condition being exposed to 60% or more of the material. The level of implementation was strongly related to the effectiveness of the program. The Botvin et al. study suggests that even the 1-day training for teachers provided in the more intensive condition may not be sufficient to produce high-quality implementation in the absence of ongoing monitoring and consultation to improve the quality of implementation. Botvin et al.'s (1990) finding that the amount of training does not explain variation in program implementation leads us to speculate that other factors influenced the quality of implementation. Although seductive, the idea that satisfactory implementation can be achieved simply by providing more training is not realistic.

Another potential explanation for weak implementation is that the program design was too complex for a typical school staff to absorb. In the 5 years we worked with the school staff, however, no person ever commented that the design was too complex. Local educators were involved in designing the program and had recommended a multicomponent approach. During debriefing interviews conducted with school staff and district administrators, no mention was made of an overly complex program. Instead, several interviewees lauded its breadth. Local school staff experienced the program as an elective ELF course, schoolwide cooperative learning, and mentoring and tutoring for high-risk youths. Although somewhat more complex than a simple prevention intervention such as a D.A.R.E. course, the level of complexity did not seem too high for the typical school staff to grasp.

The school also suffered from weak leadership at the district and school levels. The superintendent and assistant superintendent who supported the planning for the project left the district, and the task force, which had symbolized reform for the district, was disbanded. The supervisor of middle school position that had served as a link between the school and district in prior successful projects was eliminated. During the period from the inception of the project to its end, Bradley had three principals and three assistant principals. Except for the assistant principal who participated in the initial

planning of the project but who left the school before it began, none of the subsequent administrators assigned to the school provided strong leadership for the school or the project. In the absence of a strong leader to guide the school through a period of demographic instability, this instability seems to have overwhelmed both the school and the program.

General organizational incapacity also limited the potential of the program. Gottfredson et al. (1997) explored organizational factors that impeded high-quality implementation in the present investigation. We argued that the program failed to engage a critical mass of school personnel in the planning and implementation of the program and thereby failed to develop a sense of ownership and commitment to it among school staff.

Stronger implementation is expected in schools whose climates support innovation. Some of the indicators of a positive climate for change include high staff morale and involvement in problem solving rather than crisis management. Schools that are overwhelmed with basic problems such as student misbehavior are unlikely to have the capacity to innovate effectively. Bradley operated in a continual state of crisis during the project. The school was overwhelmed by constant discipline problems and a series of serious incidents involving faculty and students and continuing health crises for the principal. These events impaired the school. As documented by Gottfredson et al. (1997), teacher morale declined between 1990 and 1995, and with it teacher enthusiasm.

Weak implementation of innovations in schools is a common finding in educational research. In the 1970s and early 1980s, several studies of school innovation reported similar results: Attempts to improve educational practices in schools usually result in incomplete, inadequate, or sporadic implementation (Berman and McLaughlin 1978; Gottfredson, Gottfredson, and Cook 1983; Grant and Capell 1983; Hall and Loucks 1977; Johnson, Bird, and Little 1979; Sarason 1971). Sarason characterized many educational innovations as "nonevents," and Miles (1981) described innovations as "ornaments." Has the situation changed in the 1990s?

HOW GENERALIZABLE ARE THE "PREVENTION WORKS" FINDINGS?

Which findings are more generalizable—the positive findings summarized in the prevention literature or the null results such as those resulting from the case study described in this article? Few studies have examined variability of effects as a function of implementation conditions. But what research has been conducted suggests that when school-based programs are implemented under less than ideal conditions, results are not as positive.

Botvin, Batson, et al. (1989) reported considerable variation in quality of implementation across teachers in an experiment involving Black students in nine urban schools. In a study involving Hispanic students in eight urban schools in the New York area, Botvin, Dusenbury, et al. (1989) reported that the amount of the LST program material covered by teachers ranged from 44% to 83%. When the experimental sample was divided into high implementation (with a mean completion rate of 78%) and low implementation (mean of 56%), positive effects of the program were found to be due only to the high-implementation group. In a third study (Botvin et al. 1990), the amount of material covered ranged from 27% to 97%, with only 75% of the students in either experimental condition being exposed to 60% or more of the material. Again, the level of implementation was strongly related to the effectiveness of the program.

Close examination of several highly cited studies of effective school-based prevention practices reveals that the most positive effects are often found in the subset of classes or schools that manage to implement the program well. In addition to Botvin's careful documentation of this effect (summarized above), the studies shown in Table 5—all reporting positive results for school-based preventive interventions—actually show meager or no positive results across the entire range of settings. The results most often associated with the studies are actually due to a smaller number of classes or schools. The positive results do not even generalize to all settings included in the studies.

Systematic research on variation in prevention activity that is not part of a research study is scarce. A report (Silvia and Thorne 1997) on prevention programs implemented as part of the U.S. Department of Education's Safe and Drug-Free Schools and Communities Program found that schools rarely implemented the types of programs that have been identified as most effective in research—and their implementation is not as comprehensive or extensive as the programs that have been found to be effective in research. Isolated special events (such as annual Red-Ribbon Week events) are the most common prevention activities reported by students. Almost as many students (65%) reported receiving D.A.R.E.—for which convincing evidence of effectiveness in reducing drug use is lacking (Ringwalt et al. 1994). Silvia and Thorne (1997) also found that the amount and content of program delivery varies among classrooms within schools and among schools—even in districts trying to deliver consistent programs. Teachers reported that they had received insufficient training, were not comfortable with the material or teaching methods recommended, and prevention-related material was of low priority. If this report provides any indication of the quality and quantity of prevention practices typically implemented in schools, we can be fairly certain that prevention does not usually work.

TABLE 5: Examples of Prevention Research Reporting More Positive Results for Amenable Settings

<i>Prevention Study</i>	<i>Target Population/Duration of Program</i>	<i>Type of Prevention</i>	<i>Results</i>	<i>Qualification to Results</i>
Gottfredson, Gottfredson, and Hybl (1993)	Six middle schools with two comparison middle school/3 years	Clarify school rules, improve classroom management, increase communication with home, increase use of positive reinforcement for appropriate behavior	At end of program, treatment schools improved on intermediate outcomes targeted, including classroom orderliness, classroom organization, classroom rule clarity, fairness of school rules	Three of the six schools implemented the program faithfully. Only in these three schools were there significant reductions in classroom disruptive behavior and significant increases in on-task behavior.
Battistich et al. (1996)	12 elementary schools (fifth and sixth graders) plus 12 comparison schools/2 years	Cooperative Learning; curriculum emphasizing value of diversity; improved classroom management; "community-building" activities to foster appreciation for diversity; increased parent involvement	Significant reduction in alcohol use but not marijuana use or delinquency for treatment relative to control	In four schools with the highest level of implementation, marijuana use and 2 of 10 delinquency measures significantly favor the treatment group.
Johnson (1984); Johnson and Hunter (1985)	21 classrooms plus 14 comparison classrooms, elementary, junior, and senior high.	Law-related education	Out of 132 effects reported for 11 delinquency items, 15 showed a significant effect (13 would have been expected by chance using the one-tailed test of significance reported). None of these significant differences favored the treatment and six favored the comparison students. Significant effects on attitudes toward deviance and violence favored the comparison students.	The nine classrooms in the school that implemented LRE the best had more positive outcomes than two control classrooms in the same school on more than half of the 41 possible outcome measures, including 3 of the 11 delinquency items.

NOTE: LRE = law-related education.

CONCLUSION AND RECOMMENDATIONS

The promise of school-based prevention depends on the capacity of schools to adopt change. Bradley adopted what was offered, but in far from full form. Although data from implementation monitoring reveal that program elements were implemented, they were not implemented with the quality and intensity required to achieve desired outcomes.

We suspect that problems of demoralized school climate, weak leadership, and incapable staff are common in school-based prevention efforts in troubled schools and school districts. Gottfredson et al. (1997) reviewed literature implying great variability among communities in characteristics related to implementation strength and fidelity. Resources and conditions supportive of high-quality implementation are less likely to be found in large, urban school districts. Failed attempts to integrate research-based strategies into the real world of teachers and administrators are too common to be regarded as flukes.

Future research should focus more on clarifying which characteristics of the host environment are the most potent predictors of the capacity of the organization to absorb change, developing diagnostic tools that can be used to sort environments into different levels of technical assistance, and tailoring appropriate technical assistance strategies for these different environments. Research is needed to develop and test organization development interventions to enhance capacity for those environments judged not yet ready to undertake serious change. Prevention interventions may have to be introduced into schools in stages, with team-building and leadership developmental activities preceding any attempt to introduce more substantive changes.

Prevention research has demonstrated that prevention can work. This is an important advance and provides the necessary encouragement to justify continued spending to support prevention research. But results of prevention research will generalize with uncertainty to the typical prevention program setting—and perhaps not at all to the settings where prevention is needed most.

NOTE

1. Gottfredson, Gottfredson, and Skroban (1996) reported similar data for the first 2 years of the project. We showed that the 1991-1992 school year was largely a start-up year for the project, involving planning and a minimal amount of teacher training. The program was stronger during the 1992-1993 school year. Cooperative Learning was implemented by more than half of the teachers, but data on the intensity of the program indicated that it was implemented at less than half the intended strength (i.e., in fewer than half the number of classes intended) by those

teachers. Most eighth-grade students participated in about half as many Career Exploration and Decision Skills lessons as intended, and students in Grades 6 and 7 received a nearly complete Life Skills Training course (Grade 6) and booster (Grade 7). In addition, about one third of the high-risk youths received a small amount of tutoring (about five sessions during the year), a reasonable amount of mentoring (contact with a mentor two to three times per month during the school year), and a few high-risk students received a reasonably well-implemented Social Problem-Solving skills course. This level of implementation was still well below what was intended. Students in Grade 8, for example, received no intervention aimed at social competency promotion during the 1992-1993 school year. Not until the components were standardized as part of the Education and Life Focus class did the program reach a level of implementation that might be expected to make a difference.

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