

Outcome evaluation of a multi-component violence-prevention program for middle schools: the Students for Peace project

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Abstract

This study evaluated the effect of Students for Peace, a multi-component violence-prevention intervention, on reducing aggressive behaviors among students of eight middle schools randomly assigned into intervention or control conditions. The intervention, based on Social Cognitive Theory, included the formation of a School Health Promotion Council, training of peer mediators and peer helpers, training of teachers in conflict resolution, a violence-prevention curriculum, and newsletters for parents. All students were evaluated in the spring of 1994, 1995 and 1996 (approximately 9000 students per evaluation). Sixth graders in 1994 were followed through seventh grade in 1995 or eighth grade in 1996 or both ($n = 2246$). Cohort and cross-sectional evaluations indicated little to no intervention effect in reducing aggressive behaviors, fights at school, injuries due to fighting, missing classes because of feeling unsafe at school or being threatened to be hurt. For all variables, the strongest predictors of violence in eighth grade were violence in sixth grade and low academic performance. Although ideal and frequently recommended, the holistic approach to prevention in schools in which teachers, administrators and staff model peaceful conflict resolution is difficult to implement, and, in

this case, proved ineffective. The Students for Peace experience suggests that interventions begin prior to middle school, explore social environmental intervention strategies, and involve parents and community members.

Introduction

Although violence among adolescents is a serious public health problem, effective prevention programs remain elusive. Results from the few evaluated programs indicate little impact on reducing aggressive behaviors of middle school students (Krajewski *et al.*, 1996; Powell *et al.*, 1996) and some studies have shown a detrimental effect (Colyer *et al.*, 1996). A few successful interventions have been implemented in elementary school (Vitaro and Tremblay, 1994; Rebok *et al.*, 1996; Grossman *et al.*, 1997) or in college (Deffenbacher *et al.*, 1996). Interventions in middle school and high school, the years of highest aggression, have not shown any pattern of success (Farrell and Meyer, 1997). Some of the evaluated programs in this age group have been done with extremely high-risk populations (Deffenbacher *et al.*, 1996), rather than the general population of students, or with very small samples (Kellner and Tutin, 1995).

Theory and research on behavior change support the need for ongoing prevention programs targeting all members of the school community (Kelder *et al.*, 1997). Based on both theory and practical experience gained in a pilot study (Orpinas *et al.*, 1995), the Students for Peace project was designed. The goal of Students for Peace was to evaluate a multi-component, school-based intervention to

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prevent and reduce aggressive behaviors among middle school students. The intervention, which was implemented during three semesters, included training of students and teachers, changes of social norms, and education of parents. The strategies used to promote change, which are described in Methods, were a School Health Promotion Council that coordinated and planned the school activities, a violence-prevention curriculum, training of teachers to implement the curriculum, a peer mediation program, and newsletters to educate parents.

The purpose of this paper is to report the impact of the Students for Peace intervention on self-reported aggressive behaviors of students participating in the program compared to students who received the district's usual violence-prevention activities. The five main outcome variables were aggressive behaviors measured by the aggression scale (Orpinas, 1993), fights at school, injuries due to fighting, missing classes because of feeling unsafe at school and being threatened to be hurt.

Methods

Study design

Eight middle schools (sixth, seventh and eighth graders) of a large, urban school district in Texas were divided into matched pairs and then one of each pair was randomly assigned to either intervention or control conditions. The intervention schools received the Students for Peace multi-component violence-prevention program, while the control schools received the district's usual violence-prevention activities. School eligibility was determined by non-participation in any other violence-prevention study; 21 of the 33 district middle schools were eligible. The estimated sample size of eight schools (four intervention and four control schools) was calculated using the aggression score as the main dependent variable, standard deviation of 14.1, Type I and Type II error of 0.05 and 0.20, respectively, intraclass correlation of 0.04, and detectable difference of six aggressive behaviors per week (Kelder *et al.*, 1996). Of the

eligible schools, eight schools agreed to participate. In the spring of 1994, a baseline student survey was administered to all students in the participating schools before matching the schools. Schools were first matched on ethnic composition of students. Two schools that had mostly African-American students were matched. The other six schools that had mostly Hispanic students were then matched on the levels of aggression and frequency of fights reported on the baseline student survey. During the summer of 1994, schools were randomized into intervention or control conditions. Active intervention began in September of 1994.

The evaluation design included a cross-section and a cohort evaluation. A survey was administered to all students of the eight participating schools in the spring of 1994, 1995 and 1996. Sixth graders of 1994 were followed through seventh grade in 1995 and eighth grade in 1996. Students who completed at least one follow-up evaluation constituted our cohort. In addition to the student survey, teachers and administrators completed yearly surveys.

Sample

Approximately 9000 students completed each cross-sectional evaluation, with an almost 90% response rate (Table I). The cohort evaluation included 2246 students who completed a survey at baseline and at least one follow-up survey (follow-up rates: 1994–1995 = 69%, all three evaluations = 58%, at least one follow-up evaluation = 75%). The investigators were able to resurvey over 90% of the students who remained at their school but did not locate students who moved away from their school. School district records indicated that approximately 36% of the student population transferred out of the participating schools during the 3 years.

Two-thirds of the students were Hispanic; however, they were not evenly distributed by school. The majority of students at six of the participating schools (three intervention and three control schools) were Hispanic (71–99%). The majority of students of the remaining two schools were African-American (60–62%). According to the

Table I. Characteristics of the total sample by evaluation

	Cohort ^a		Cross-sectional					
	<i>n</i>	%	1994		1995		1996	
			<i>n</i>	%	<i>N</i>	%	<i>n</i>	%
Total/response rate	2246	74.5	8863	88.4	9115	86.8	9364	85.9
Gender								
boys	1132	50.4	4477	50.5	4584	50.3	4780	51.0
girls	1114	49.6	4381	49.4	4512	49.5	4547	48.6
Grade								
6	2246	100.0	3162	35.7	2967	32.6	2876	30.7
7	2090	93.1	2889	32.6	3483	38.2	3114	33.2
8	1745	77.7	2806	31.7	2665	29.2	3387	36.1
Race/ethnicity								
Hispanics	1537	68.4	5831	65.9	5715	62.7	5884	62.8
African-Americans	382	17.0	1701	19.2	1689	18.5	1743	18.6
Caucasians	180	8.0	727	8.2	525	5.8	480	5.1
Asians	79	3.5	307	3.5	300	3.3	335	3.6
Native Americans	12	0.5	64	0.7	45	0.5	50	0.5
other/biracial	56	2.5	216	2.4	797	8.7	822	8.8
Intervention group								
intervention	1020	45.4	4016	45.3	3946	43.3	3948	42.2
control	1226	54.6	4846	54.7	5169	56.7	5416	57.8
Substance use prevalence ^b								
5+ drinks in a row	169	8.8	1310	16.6	1879	21.4	2037	23.1
marijuana	161	8.6	1553	20.0	1241	14.2	1484	16.3
inhalant (glue/paint/gas)	222	11.9	1262	16.4	796	9.2	963	10.6
cocaine	75	4.0	556	7.2	480	5.5	569	6.3
Weapon-carrying prevalence ^b								
handgun	122	5.6	933	10.9	667	7.4	771	8.3
knife	309	14.3	1745	20.4	1242	13.8	1595	17.2
club, stick	346	16.1	1471	17.2	834	9.3	1174	12.6

^aCohort evaluation includes all students present at baseline survey and in at least one more evaluation.

^bSubstance abuse and weapon-carrying prevalences for cohort corresponds to the 1994 baseline survey. Some categories do not sum to total due to missing data.

school district's yearly report, district-wide 52% of the students are Hispanic, 35% are African-American and 11% are Caucasian. District records report that the percentage of students considered to be at risk of dropping out of school ranged among the participating schools between 35 and 80% (average for the district was 50%; averages for the intervention and the controls schools were 55 and 48%, respectively). At risk of dropping out was defined by the school district as any student who met at least one of the Texas Education Agency criteria (e.g. limited English proficiency, failed a state test, failed to meet promotion require-

ments, being two or more years below grade level). The percentage of students receiving free or reduced cost lunch ranged by school between 37 and 61% (average for the district was 55%; averages for the intervention and the control schools were 61 and 60%, respectively).

The student survey, as well as the use of passive informed consent, was approved by the Committee for the Protection of Human Subjects of The University of Texas–Houston and by the school district's research department. Before administration of the questionnaire, a letter signed by the school principal was sent to parents explaining

the purpose and content of the evaluation. Parents who did not wish that their child participate in this evaluation could sign the letter and return it to the school. Research staff administered the questionnaire following standardized instructions. Students who did not wish to answer the questionnaire or whose parent had signed the letter were given another activity. The questionnaire was anonymous for students in the cross-sectional evaluation. Cohort students were identified by name and birth date, but had the option of completing the survey with no identification ($n = 76$).

Measures

Measures of students' aggressive behaviors and safety in the school environment were obtained through students' self-reports on three surveys (fall of 1994, 1995 and 1996). Three measures of students' aggressive behavior and two measures of safety in the school environment were the main outcome variables. Indicators of students' aggressive behaviors were scores on the aggression scale, frequency of fights at school and frequency of injuries due to fights. The aggression scale (Orpinas, 1993) is a self-report measure of aggressive acts committed during the week prior to the survey. This short time period allows for easier recall of events. In the development of the scale, it was observed that students did not remember well the frequency of behaviors in a larger time span. The scale is composed of 11 items with responses ranging from 0 to 6 or more times. Students' scores ranged between 0 and 66 points. Each point represents one aggressive behavior the student engaged in during the week prior to the survey. The scale includes behaviors such as teasing, pushing, name-calling, hitting, encouraging students to fight, kicking, threatening to hurt or hit and getting angry easily. The internal consistency of the scores of the aggression scale was high (Cronbach's $\alpha = 0.88$ at baseline). The high internal consistency of the scores and the results of the principal component analysis support the use of the scale as a measure of a single construct.

The student survey included questions to measure fights and injuries from the Centers for

Disease Control and Prevention's Youth Risk Behavior Survey (Kolbe, 1990). Frequency of fights at school ranged from 0 to 10 or more times in the year prior to the survey. Frequency of injuries due to fighting ranged from 0 to 6 or more times in the prior year (1994 survey) or prior month (1995 and 1996 surveys). A study conducted by Brener and colleagues in a sample of adolescents showed that test-re-test reliability scores were substantial for physical fights ($\kappa = 0.68$) and somewhat lower for injuries ($\kappa = 0.51$) (Brener *et al.*, 1995).

The student survey also included questions from the New York Study (Ginsberg, 1993) that assessed perceptions of school safety. The number of days of school absences due to feeling unsafe at school ranged from 0 to 6 days in the prior month. Frequency of threats received at school ranged from 0 to 6 or more times in the prior year (1994 survey) or prior month (1995 and 1996 surveys).

Intervention description

During the academic year prior to the intervention (first year of the study), research staff and district administrators met to evaluate and refine existing district resources to develop a theoretically sound intervention program. Therefore, if the program was found effective, the district would have the necessary documentation, personnel and skills for broader dissemination. The intervention was planned using Social Cognitive Theory as a guide (Bandura, 1986). Behavior is explained by Social Cognitive Theory in terms of a model in which behavioral, social-environmental and personal factors are in continuous interaction. In order to modify aggressive behavior, strategies were designed to influence both environmental and personal factors. Thirty-three focus groups and eight in-depth interviews were conducted with students and teachers to evaluate intervention components and optimize implementation. The four main intervention components and the results of these evaluations are described in detail in Kelder *et al.* (Kelder *et al.*, 1996) and in brief below.

School Health Promotion Council

In order to coordinate all violence-prevention activities and to develop prevention programs

especially targeted to the characteristics of the students of each school, a School Health Promotion Council was formed at each intervention school. The Council was composed of a paid school coordinator, three to 10 teachers from different specialties and, in some schools, a school nurse or counselor. The Council coordinated curriculum implementation and teacher and student training, and organized special peace-related activities (writing contests using peace as the main motif, anti-gang plays or a 'peace week', in which all teachers incorporated the concept of peace into their teaching program).

Curriculum

Before Students for Peace began, the school district had selected 'Second Step: A Violence Prevention Curriculum' (Committee for Children, 1990) as its violence-prevention curriculum. However, the implementation of Second Step prior to Students for Peace had been voluntary and no school had implemented the curriculum school-wide. The curriculum's goal is to reduce impulsive and aggressive behaviors, and increase social competence. The curriculum includes information about violence, and training on empathy, conflict resolution and anger management. Teachers were trained on conflict resolution and on how to teach this curriculum.

Student training

To promote non-violent norms and provide students with an alternative method to solve conflicts, two programs were implemented, 'Peer Mediation' and 'Peers Helping Peers'. The Peer Mediation program trained students to mediate conflicts, both formally and informally, among their fellow students. Peer mediators addressed behaviors such as name-calling, rumors and threats. The Peers Helping Peers program trained students to meet one-on-one with students who request their help because of personal problems such as alcohol and drug use, school attendance, conflicts with other students or within their family, and academic problems. The goal of training students in these programs was to modify social

norms about violence and to provide alternatives to violence.

Parent education

Parents received monthly newsletters with testimonies of parents and their children describing how they avoided or prevented violence. Newsletters were based on behavioral journalism, a type of communication in which messages are drawn from the same population for which they are intended (McAlister, 1995). The newsletters encouraged parents to use positive conflict resolution tactics with their children, increase parental monitoring, and reduce their own modeling and praise of aggressive behavior. The newsletters modeled skills among students such as how to avoid fights or how to respond to threats and name-calling. A full description of the newsletter intervention can be found in McReynolds *et al.* (McReynolds *et al.*, 1996).

Statistical analyses

Although schools were matched prior to randomization, the authors employed an unmatched analysis. Matching decreases the power of the design when the number of schools is small and when the matching variables are not known to be highly correlated with the outcome variables. Since pairs of schools were selected well in advance of the intervention and the appropriate matching variables were truly unknown, the design employed was the hybrid design suggested by Diehr and colleagues, in which schools were matched but then results were analyzed as if matching did not occur. This design improves power and preserves the Type I error (Diehr *et al.*, 1995; Proschan, 1996).

The main analysis of the cohort data was based on a nested cohort design model that used an adjusted time by treatment analysis (Murray, 1998). This statistical model recognizes the hierarchical structure of the design, and provides variance and covariance adjustments for the levels of the structure, i.e. repeated measurements within individuals within treatments within schools. Covariates included in this model were baseline

scores, race/ethnicity and academic performance. These last two were chosen because they were related to the dependent variable, and were not equally distributed between treatment and control. Only those students who completed the baseline survey and one of the subsequent follow-up surveys were included in the cohort analyses.

The analysis for the cross-sectional data was based on a nested cross-sectional model, with the covariates race/ethnicity and academic performance, but without the repeated measurements on the students (Murray, 1998). For the cross-sectional analyses, intervention effects were assessed on eighth graders in 1994 (baseline) and at each follow-up (eighth graders in 1995 and 1996). Eighth graders were selected to minimize the confounding effect of age and grade, and to evaluate students with no intervention, 1 year of intervention and 2 years of intervention. Both nested cohort and nested cross-sectional analyses are presented separately for boys and girls. The analyses were computed using the SAS system for Windows, release 6.12, SAS PROC MIXED.

Results

Evaluation of program implementation

Implementation details are given for each of the four program components.

School Health Promotion Council

Although all four schools began school health promotion councils, only two of four implemented them fully. Two schools had significant teacher and administration buy-in, and regularly scheduled planning meetings. In the other two schools, the program coordination was carried out mainly by the paid school coordinator with little additional support from other faculty, especially during the first year of the intervention. This lack of participation was a reflection of staff turnover and conflicts among teachers or between teachers and the administration (Orpinas *et al.*, 1996).

Curriculum

Between September and November of 1994, teachers were trained to implement Second Step.

Two intervention schools elected to train all teachers to teach the Second Step curriculum. In the other two schools, fewer teachers were trained (10–25%) and they taught multiple sections of Second Step. In these schools, the remaining teaching staff participated in a 2-h training session in conflict resolution. By the spring of 1995, nearly all intervention schools had received the Second Step program. In the fall of 1995, school administrators gave teachers the option of teaching Second Step again or of using another violence-prevention curriculum. Implementation of the curriculum varied by school during the second year. One school taught Second Step to all students a second time and one school taught the curriculum only to their new unexposed sixth graders. In the other two schools, the implementation was optional, i.e. depended on the interest of the teacher. In the 1996 teacher evaluation (intervention schools: $n = 222$, response rate = 75%; control schools: $n = 154$, response rate = 48%), a fairly high percentage (30%) of the teachers in the intervention schools stated that they had taught four or more lessons from a violence-prevention curriculum. (Not all teachers were required to teach the curriculum.) Seven percent of the teachers from the control schools stated that they had taught four or more lessons from a violence-prevention curriculum; however, interviews with school administrators indicated that no violence-prevention curriculum had been systematically implemented in the control schools.

Peer mediation and peer helper training

During the first year of Students for Peace implementation, 50–60 students per intervention school were trained to be both peer mediators and peer helpers. During the second year (fall of 1995), additional students were trained at each school, especially sixth graders. Two teachers per school served as sponsors, met regularly with students and kept a log of their activities. Students developed their own posters and announcements to promote their programs and make student participation more attractive. Schools promoted peer mediation as an alternative to suspension. In

the intervention schools, 63% of the teachers had either sent students to peer mediation or had had informal mediations in their classrooms, while only 35% of the teachers in the control schools reported using a peer mediation program. In relation to Peers Helping Peers, 50% of the teachers in the intervention schools and 19% of the teachers in the controls schools used the Peers Helping Peers program. Results from the student survey, however, showed that the number of students who defined themselves as mediators and the number of students who participated in a mediation, either as a mediator or as a student in conflict, was similar between intervention and control schools. In addition, more students defined themselves as peer helpers in the control schools (22%) than in the intervention schools (18%).

Parent education

Between December 1994 and January 1996, 11 newsletters were sent with the children to all parents in the intervention schools. To develop the newsletters, a total of 247 persons (students and parents) from the four intervention schools participated in either interviews or focus groups. No information was gathered on whether the parents read the newsletters. Results from the student survey revealed that only 27% of the students in the intervention schools read the newsletters. Most of the students who read the newsletters (89%) agreed with the content.

Summary of implementation

Although the intervention components did not occur with the intended intensity at all of the intervention schools, they were fully implemented in two schools and partially implemented in the other two. In the high implementation schools, all teachers were trained and the School Health Promotion Council was active. In the other two schools, fewer teachers were trained and fewer participated in the Council. According to the teachers' self-report, the number of teachers involved in teaching any form of violence-prevention curriculum was over 4 times higher in the intervention schools than in the control schools.

However, according to school administrators, no violence-prevention curriculum had been implemented or adopted in the control schools, leading one to believe that teachers in the control schools were delivering their own individually written lessons. Peer Mediation was used by 63% of the teachers in the intervention schools, almost twice as many teachers as in the control schools (35%). Peers Helping Peers was used by 50% of the teachers in the intervention schools, as compared to 19% in the control schools. Eleven newsletters were sent to the 5000 students and their families in the intervention schools. All intervention schools had additional activities planned by the School Health Promotion Council (such as plays, writing contests, etc.). These activities differed by school but the objective was the same: to unify students in creatively promoting alternatives to physical fighting. The control schools did not have a School Health Promotion Council, did not have teacher training, did not receive the student newsletter, did not have special activities and did not implement a formal curriculum. Some of the control schools had a Peer Mediation or a Peers Helping Peers program, but these programs were delivered with less intensity than in the intervention schools. These programs were part of the district's usual violence-prevention activities.

Comparisons at baseline

At baseline, intervention and control groups were not significantly different on any violence-related variables. In the baseline cross-sectional sample, the overall mean score on the aggression scale was 16.2 points (SD = 14.4, range = 0 to 66), i.e. on average students committed 16 aggressive acts during the week prior to the survey. During the month prior to the survey, 22.8% of the students fought at school, 14.4% were injured in a fight, 12.8% missed class because they felt unsafe in the school building and 27.7% were threatened to be hurt at least once. All scores were significantly higher for boys than for girls ($P < 0.001$).

Students who were lost to follow-up were significantly different from students who were resurveyed. Not unexpectedly, students lost to

Table II. Comparison of violence-related behaviors of students in the cohort and students who dropped out (sixth graders, 1994)

Violence-related variables	Time frame	Cohort ^a (n = 2246)	Dropout ^b (n = 1048)
Main outcome variables			
aggression score (mean)	prior week	14.3	19.4
fought at school (%)	prior month	22.4	33.5
injured in a fight (%)	prior year	13.7	20.3
missed class-felt unsafe at school (%)	prior month	10.4	20.4
threatened to hurt at least once (%)	prior year	24.4	33.6
Substance use variables			
drank alcohol (%)	prior month	8.8	19.0
used marijuana (%)	life time	8.6	21.4
used inhalants (glue/paint/gas) (%)	life time	11.9	20.9
used cocaine (%)	life time	4.0	10.6
Weapon-carrying variables			
carried a handgun (%)	prior month	5.6	13.2
carried a knife or razor (%)	prior month	14.3	24.1
carried club or stick (%)	prior month	16.1	22.4

^aStudents present at one of follow up evaluations.

^bStudents present only at baseline, who had an identification.

All differences were statistically significant ($P < 0.0001$).

follow-up displayed a poorer profile on the five main outcome variables, as well as on other related variables, in some cases by a factor of 2 (Table II). Students who dropped out were also more likely to be males and older. Attrition did not vary by intervention condition.

Assessing program effects

Results from the cohort evaluation showed no significant intervention effect, as shown by the 95% confidence intervals of the net difference between intervention and control for each variable (Table III). A negative difference value reflects that students in the intervention condition fared worse than those in the control condition. For boys, only one comparison achieved statistical significance, 'injuries at school', with the direction of effect opposite to that anticipated. Overall, the general trend (although not statistically significant) was towards a negative intervention effect, with eight of 10 estimates tending in the opposite direction. Only 'missing school due to feeling unsafe' was in the anticipated direction, the result being marginal at the second follow-up. For girls, while the direction of effects was mixed, none of the effects achieved statistical significance. The

point estimated differences in most cases were very small. To evaluate whether the intervention had an effect on subgroups of students, data were also analyzed by quintiles of aggression, but no intervention effects were found for any of these subgroups.

In the cohort evaluation, for boys and girls and for all outcome variables, the main predictor of violence in eighth grade was violence in sixth grade ($P < 0.0001$ for all variables, except for boys in 'Missed class because felt unsafe at school' $P < 0.01$, and for girls in 'Injured in a fight' $P < 0.07$). In addition, academic performance was also a significant predictor ($P < 0.05$ for all variables, except for girls in 'Threatened to be hurt at least once,' which was not significant). Students with lower grades (Cs, Ds and Fs) were the most likely to be involved in violence.

In the cross-sectional evaluation, program effects were modeled by examining the slope of the 3-year trend and testing for parallelism. Results showed no significant intervention effect. Overall, prevalence of some measures of aggression tended to decline in each successive wave of eighth-grade students, particularly between the first and second evaluations, while others did not change (Table IV).

Table III. Adjusted main outcome variables by intervention and gender, cohort evaluation

Main outcome variables	Intervention			Control			1995		1996	
	1994 (n = 1020)	1995 (n = 929)	1996 (n = 788)	1994 (n = 1226)	1995 (n = 1161)	1996 (n = 975)	Diff ^a	(95% CI)	Diff ^b	(95% CI)
Boys										
aggression score (mean)	16.1	16.7	16.3	15.6	15.3	15.4	-1.4	(-5.5, 2.7)	-1.0	(-5.1, 3.2)
fought at school (%)	31.1	19.4	22.0	26.9	18.3	15.8	-1.2	(-8.5, 6.2)	-6.3	(-14.1, 1.6)
injured in a fight (%) ^c	17.7	10.2	11.6	18.8	7.5	5.0	-2.7	(-7.0, 1.5)	-6.7	(-11.3, 2.1)
missed class/felt unsafe at school (%)	13.0	7.9	4.1	9.0	8.5	9.1	0.6	(-4.9, 6.1)	4.9	(-0.9, 10.8)
threatened to hurt at least once (%) ^c	29.9	29.3	20.8	29.3	20.4	20.6	-8.8	(-18.9, 1.3)	-0.3	(-10.9, 10.4)
Girls										
aggression score (mean)	13.0	14.4	12.6	12.5	12.0	12.2	-2.4	(-5.7, 0.9)	-0.4	(-3.8, 2.9)
fought at school (%)	14.2	12.8	10.3	17.5	10.8	10.4	-2.1	(-8.8, 4.6)	0.1	(-6.9, 7.1)
injured in a fight (%) ^c	7.8	3.7	4.5	10.1	4.6	3.8	0.9	(-3.6, 5.3)	-0.7	(-5.3, 3.9)
missed class/felt unsafe at school (%)	13.0	8.0	7.3	7.8	9.4	7.3	1.4	(-4.2, 6.9)	0.0	(-5.9, 5.8)
threatened to hurt at least once (%) ^c	20.5	16.7	10.9	18.8	18.6	10.3	1.9	(-5.5, 9.3)	-0.6	(-7.2, 8.3)

^aDiff 1995: difference between intervention and control conditions in 1995 after adjustment for the 1994 measurement.

^bDiff 1996: difference between intervention and control conditions in 1996 after adjustment for the 1994 measurement.

^cInjured in a fight and threatened to hurt: time frame at baseline was 'prior year' and at follow-ups was 'prior month'.

All responses were adjusted for academic performance and race/ethnic background.

In the cross-sectional evaluation, the strongest predictor of violence was academic performance. Students with lower grades were the most likely to be involved in violence ($P < 0.0001$ for all variables except threatened, boys $P < 0.02$, girls $P < 0.01$). For boys and girls, being Hispanic or African-American was a predictor of higher aggression scores and of a greater chance of being threatened to be hurt ($P < 0.001$). For boys, being Hispanic or African-American was a predictor of a greater chance of being injured in a fight ($P < 0.001$).

In order to understand this lack of intervention effect, two additional explanatory variables were examined. The first was community violence, i.e. how much violence they had seen in their community (e.g. arrests; gangs; someone being beaten, stabbed or shot) during the year prior to the study. The students who participated in this study were exposed to very serious levels of violence in their communities. Only 5% of the students reported

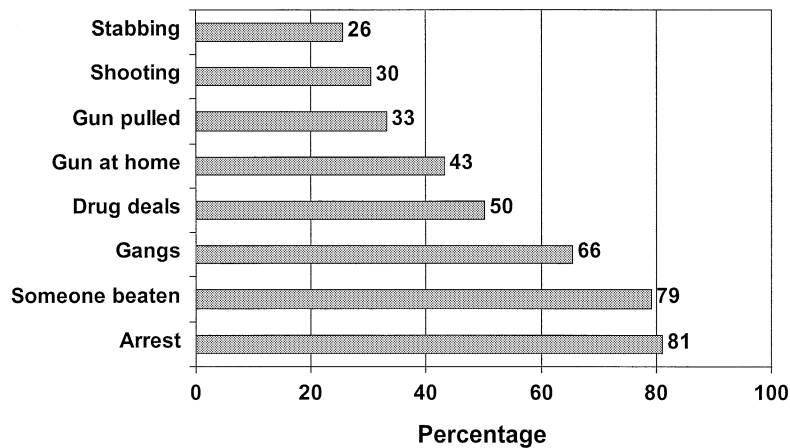
never seeing any form of violence in their communities and over half of the students reported seeing four or more forms of violence during the year prior to the survey (Figure 1). In addition, the authors examined the relation between community exposure and level of aggression. Individually and in aggregate (sum of all exposures), community violence was strongly and significantly related to student level of aggression, in many cases by a factor of 4. These data suggest that the students live in generally unsafe, possibly harmful communities and that high levels of exposure may foster student aggression. The Students for Peace intervention did not address community violence.

The second variable examined was the influence of parents. An analysis of the baseline data showed that family-related variables explained almost one-third of the variance of the aggression scale scores. In particular, parental communication regarding fighting was the strongest predictor of students' violence. A strong linear relation was observed

Table IV. Adjusted main outcome variables by intervention and gender, cross-sectional evaluation of eighth graders

	Intervention			Control		
	1994 (n = 4016)	1995 (n = 3946)	1996 (n = 3948)	1994 (n = 4846)	1995 (n = 5169)	1996 (n = 5416)
Boys						
aggression score (mean)	20.2	17.9	16.6	18.0	17.7	15.6
fought at school (%)	25.3	20.7	24.4	25.2	20.9	19.5
injured in a fight (%) ^a	16.7	11.1	12.8	17.1	7.7	8.7
missed class/felt unsafe at school (%)	14.2	14.9	10.4	14.8	13.2	10.5
threatened to hurt at least once (%) ^a	14.2	14.9	10.4	14.8	13.2	10.5
Girls						
aggression score (mean)	14.9	14.0	13.3	14.3	12.5	12.9
fought at school (%)	13.3	11.7	12.7	16.5	9.7	10.5
injured in a fight (%) ^a	8.3	5.4	4.4	8.9	4.8	5.5
missed class/felt unsafe at school (%)	12.6	12.2	8.2	9.8	9.1	10.0
threatened to hurt at least once (%) ^a	24.4	12.9	13.0	14.5	19.8	11.1

^aInjured in a fight and threatened to hurt: time frame at baseline was ‘prior year’ and at follow-ups was ‘prior month’. All responses were adjusted for academic performance and race/ethnic background.



Note: 8259 students answered at least one question; sample size varies slightly by question.

Fig. 1. Violence seen in the community during the year prior to the survey (n = 8259).

between parental statements supporting peaceful alternatives to solve conflicts or supporting fighting as a way to solve conflicts and the number of aggressive acts per week (Orpinas *et al.*, 1999). The effect was similar for boys and girls, and extreme categories differed by a factor of 4 (Figure 2). A study in progress by the authors shows that students who had a good relationship with their

parents during middle school or students whose relationship with their parents improved from sixth to eighth grade had the lowest aggression scores; whereas students whose relationship with parents got worse or had been bad all along had significantly higher aggression scores. Aggression scores for students with a bad relationship with parents were twice as high as for students with a

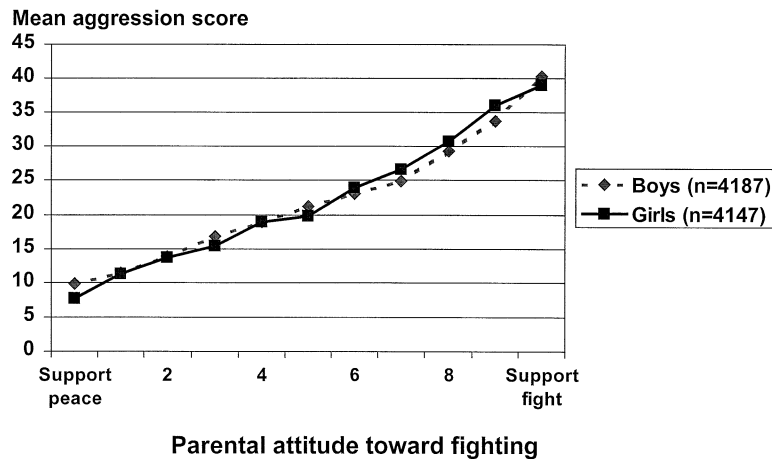


Fig. 2. Mean scores on the aggression scale by perception of parental attitude toward fighting and gender.

good relationship with parents. In Students for Peace, parents were a minimal target of the intervention.

Discussion

The evaluation of the Students for Peace project showed that this multi-component, violence-prevention intervention did not reduce students' aggressive behaviors among a sample of urban, poor, largely minority students. No statistically significant differences between intervention and control schools were found in any of the outcome variables. Moreover, although not statistically significant, the authors observed a slight increase in aggressive behaviors in selected variables in the intervention schools when compared to the control schools. Possible explanations are multiple. The first refers to fidelity of intervention implementation. In two of the four schools, the intervention was well implemented: most teachers and students were trained, students participated in mediation, and creative ways of promoting peace were implemented. In the other two schools, the implementation was weaker, perhaps because these schools were unprepared for implementing a program of this magnitude. One of these schools experienced a high teacher turnover rate, in excess of 50%, increasing the level of tension and

reducing the number of trained faculty. In spite of differing levels of implementation, results did not reveal greater reductions in aggressive behaviors in high implementation schools compared to low implementation schools.

In the researchers' experience, the implementation of large, multi-component prevention programs in schools is a challenge for both researchers and school staff. It requires a strong commitment from school principals and support from teachers. Not all schools are prepared for such a challenge. In order to achieve a 3-year commitment, the project was presented to each school's 'Shared Decision Making Committee', which was composed of a selected group of teachers and administrators. Students for Peace was approved and a signed 'Participation Agreement' was obtained. None of the eight schools dropped out of the project, in spite of the large turnover rate of administrators, teachers and students. Nevertheless, several factors influenced the level of teacher support for the intervention. Although the site-based team agreed to participate, most teachers were not involved in the decision, yet were still required to teach the curriculum and to participate in the intervention. Some teachers resented the additional burden of teaching a new curriculum that was not central to the school's educational mission. Indeed, our assessment of teacher burnout

using the Maslach Burn Out Inventory for Teachers (Maslach and Jackson, 1993) indicated that 58% of teachers were classified as 'emotionally exhausted.' Some teachers stated that Second Step failed to reflect the realities of their poor urban students. Other teachers were simply not prepared to change their personal teaching style or to model peaceful conflict resolution (Orpinas *et al.*, 1996). The net effect of these unanticipated factors was reduced implementation efficacy. Finally, time was a factor against the implementation and evaluation of the program. Implementing a program of this magnitude implied achieving multiple level changes at the schools that, in hindsight, requires more than three semesters to achieve. Results indicate the need to involve teachers early in the development of the program, to assure that the curriculum is culturally appropriate and accepted by teachers, to intervene for a longer period of time, and to conduct controlled program evaluations prior to wholesale adoption.

A second explanation for the lack of intervention effects is that the intervention, in spite of its multiple components, was not strong enough. A possible flaw is that most intervention components were targeted at the whole school, while none were planned for the very high-risk children, who might have not benefited from this universal prevention program. Children with high levels of violence may be in need of intensive psychological, familial and educational interventions.

The evaluation design of real world schools poses additional difficulties. In this study, the number of students was very large (approximately 9000) but the sample size was very small (eight schools). This is a problem in most school-based research. The small number of schools made it difficult to find an appropriate match for each school. However, differences in baseline were taken into account by the statistical analysis. Given the magnitude of observed effect sizes (zero to negative), power is not a major concern.

Quasi-experimental designs, in which schools are randomly allocated to intervention or control, pose an additional threat to validity. Given the high prevalence of school violence, most schools

will implement programs to reduce and prevent violence. In fact, all the control schools had some prevention activities, although they were not as coordinated or as strong as in the intervention schools. Some control schools were sorely disappointed in not being selected for the intervention and implemented their own violence-prevention programs. By virtue of volunteering to participate in the study, all eight schools recognized violence as a problem, and were ready and willing to implement prevention interventions. How much this compensatory rivalry influenced the evaluation is difficult to quantify. For example, one of the control schools instituted uniforms to curtail gang-related violence and another initiated a peer mediation program. In addition, some students or teachers from the intervention schools may have moved to one of the control schools. Planned process measures may have captured these changes but were reduced from the evaluation at midcourse due to budgetary considerations.

Another explanation of the lack of intervention effect pertains to measurement. Measurement could have been influenced by the fact that students who participated in the intervention may have been sensitized to the problem of violence. Because they were sensitized and taught to pay increased attention to their behavior, they may have become more accurate self-reporters of their own tendencies towards violence. Thus, after the intervention, students may have evaluated behaviors as aggressive that were not seen as aggressive before the intervention. This change in the students' internal standard for their behavior is a response shift resulting from the intervention. The response shift becomes a bias as it results in different scale units at the post-test than at baseline for those students in the intervention group (Sprangers and Hoogstraten, 1989). A retrospective pretest, i.e. asking respondents today how they perceive their behavior in the prior year, has been suggested as a methodology for controlling for response shift bias (Howard, 1980).

A second measurement problem was that the survey may not have registered the changes that occurred. In the intervention schools where the

implementation was most complete, informal comments from teachers, administrators and police officers indicated numerous positive changes in students and teachers. For example, previous problem students had improved their academic standing in order to participate in the mediation program and as many as 10 mediations per day covered serious gang-related conflicts. The survey may not have been sensitive enough to detect these changes. A recent evaluation of the impact of Second Step in reducing aggressive behaviors among elementary school children showed no significant differences between intervention and control in teacher-reported or parent-reported behavior scales; however, behavioral observations did show a significant decrease in aggressive behaviors in the intervention group (Grossman *et al.*, 1997).

As discussed in the analysis of explanatory variables, another source of concern is the influence of parents and the community. Given that parental variables explained almost a third of the students' aggressive behaviors (Orpinas *et al.*, 1999), violence-prevention programs should include a strong parental component. In addition, students from this study lived in poor communities with an overwhelming amount of violence. Under these conditions, it proved difficult to persuade students to solve conflicts peaceably when their environment was telling them otherwise. Many of the students reported little involvement with their parents, high levels of alcohol and drug use, weapon carrying, and high rates of community violence. In this environment, 'student-centered' interventions may be ineffective.

Conclusion

In sum, the Students for Peace intervention did not reduce students' aggressive behaviors in a sample of low income, urban, minority students. A comprehensive approach to violence prevention in schools is difficult to implement. It may require a long time and a strong commitment by teachers, administrators and staff to achieve peaceful conflict resolutions. Given that the strongest predictor of

violence in eighth grade was previous aggression, prevention programs should start earlier. This is consistent with longitudinal studies that have shown that adolescent violence can be predicted as early as first grade (Tremblay *et al.*, 1995). Finally, school-based interventions should not neglect the family and the community, which can increase students' risk for violence and make 'student-centered' approaches less effective. Violence-prevention interventions should explore strategies that include both the families and the communities.

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