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The Effects of Primary Division, Student-mediated Conflict Resolution Programs on Playground Aggression

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This study examined the effects of a student-mediated conflict resolution program on primary school (junior kindergarten to grade 5) playground aggression. Mediation teams of grade 5 students (approximately age 10) participated in 15 hours of training according to the model developed by Cunningham, Cunningham, and Martorelli (1997). Following baseline observations, mediation was introduced onto the playgrounds of three schools according to a multiple baseline design. Mediators successfully resolved approximately 90% of the playground conflicts in which they intervened. Direct observations suggest that the student mediation program reduced physically aggressive playground behavior by 51% to 65%. These effects were sustained at 1-year follow-up observations. Teacher and mediator satisfaction questionnaires provided strong support for impact, feasibility, and acceptability of this program.

Keywords: Aggression, school children, school, mediation.

Introduction

Conflict between peers, bullying, relational aggression, and physical aggression emerge in preschool settings (Crick, Casas, & Mosher, 1997) and persist through the elementary (Smith & Levan, 1995), middle (Boulton & Smith, 1994; Olweus, 1993), and secondary school years (Whitney & Smith, 1993). Whereas a small group of children are consistently victims of interpersonal aggression, a larger number of children are involved as perpetrators, passive participants, or witnesses (Craig & Pepler, 1996; Olweus, 1991, 1993, 1994; Perry, Kusel, & Perry, 1988; Whitney & Smith, 1993). Norwegian (Olweus, 1991, 1993, 1994), Swedish (Olweus, 1993), British (Whitney & Smith, 1993), Australian (Rigby & Slee, 1991), Canadian (Craig & Pepler, 1996), and American (Perry et al., 1988) studies suggest that bullying and aggression are a cross-cultural concern.

In primary schools, most conflict, bullying, and aggressive behavior occurs on the playground (Olweus, 1991, 1994; Rivers & Smith, 1994; Stephenson & Smith, 1989; Whitney & Smith, 1993). Despite the presence of supervisors, student reports (Olweus, 1991; Olweus, 1993; Whitney & Smith, 1993) and direct observations (Craig & Pepler, 1996) suggest that adults detect and intervene in a small percentage of the aggressive incidents occurring in playground settings. Although aggressive interactions are often observed by peers, children are hesitant to intervene or inform adults (Olweus, 1993; Rivers & Smith, 1994; Whitney & Smith, 1993). Indeed, other students may justify (Oliver, Hoover, & Hazler, 1994), reinforce (Craig & Pepler, 1996; Olweus, 1993), or join in bullying and aggressive behavior (Olweus, 1993).

Playground aggression represents an important milestone in the emergence of more serious antisocial behaviour (Coie, 1996; Patterson, Reid, & Dishion, 1992). In addition to being a significant source of stress to victims (Boney-McCoy & Finkelhor, 1995; Sharp, 1996), children engaged in bullying and aggressive playground behavior are often rejected by peers (Boulton & Smith, 1994; Dodge, Coie, & Brakke, 1982; Dodge, Coie, Pettit, & Price, 1990) and may themselves become victims of playground aggression (Boulton & Smith, 1994). Peer rejection may encourage differential association with more deviant children, a mechanism linked to the emergence and stability of more serious antisocial behavior (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988; Patterson et al., 1992).

Preventing or reducing aggressive behavior at school requires an intervention which affects playground interactions where conflicts occur, is sustainable across the

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developmental period in which these problems emerge, is acceptable to educators and parents, and is affordable in an era of economic restraint (Coie, 1996; Offord, 1996). Student-mediated conflict resolution programs represent a widely disseminated, though largely unstudied, approach to playground conflict (Cunningham & Cunningham, 1995, in press). In playground mediation programs, student mediators are trained to intervene when conflict occurs, offer disputants the opportunity to resolve disputes, and assist in the negotiation of a resolution.

There are a number of potential benefits to student-mediated conflict resolution programs. First, student mediation focuses directly on potentially aggressive playground interactions. Primary division student mediation programs operate during recess periods when surveillance by teachers is low and the risk of conflict, bullying, and aggressive behaviour is high (Olweus, 1991; Rivers & Smith, 1994; Whitney & Smith, 1993). Second, since mediation is conducted on the playground where aggressive interactions occur, mediators can detect conflicts quickly and intervene before disputes escalate. Third, student mediators may be more aware than adult playground supervisors of the subtler types of relational aggression occurring among peers (Crick, Bigbee, & Howes, 1996). Fourth, in contrast to clinic-based programs, which fail to reach many high-risk families (Cunningham, Bremner, & Boyle, 1995), student-mediated conflict resolution is a universal intervention with potential benefits to the entire school. Although these programs avoid labeling (Harris, Milich, Corbitt, Hoover, & Brady, 1992) or aggregating high-risk children (Dishion & Andrews, 1995), mediators inevitably target aggressive students with more opportunities to rehearse alternative dispute resolution strategies. Since student mediation programs can be sustained throughout the primary, middle, and secondary school years, they may be a particularly important component in the management of problems that emerge at different developmental points, escalate gradually, and persist over many years. Finally, given relatively low cost, mediation programs are affordable in an era of economic restraint (Yates, 1994).

Despite conceptual appeal, descriptive reports of successful implementations (Cameron & Dupuis, 1991; Johnson, Johnson, Dudley, & Burnett, 1992; Koch, 1988; Lane & McWhirter, 1992; Welch, 1989), and a proliferation of training materials (Schrumph, Crawford, & Usadel, 1991), we are aware of no controlled studies supporting the efficacy or effectiveness of student-mediated conflict resolution programs (Hundert, 1995). This study, therefore, examined the effectiveness (Hoagwood, Hibs, Brent, & Jensen, 1995) of a primary division student-mediated conflict resolution program. Teams of 5th-grade students were trained to mediate conflicts during recess periods. A multiple baseline (Barlow & Hersen, 1984) across three schools was used to determine the effects of student mediation on weekly observations of physically aggressive playground interactions. One-year follow-up observations were conducted to determine the stability of the mediation program and its longer-term impact on playground aggression. To enhance the ecological validity of this study and ensure the transportability of the intervention (Kendal & Southam-Gerow, 1995), a standard mediation program (Cunningham et al., 1997) was introduced into study schools by social workers from the Board of Education. Since the dissemination and adoption of innovative interventions depends upon community perceptions regarding their feasibility, acceptability, and outcome, mediators and teachers provided detailed consumer satisfaction data regarding the program (Hoagwood et al., 1995).

Method

Subjects

Three primary division schools (students aged approximately 4 to 10 years) interested in starting student mediation programs volunteered to participate in this study. School 1, with approximately 483 students, was located in a neighborhood composed of lower-middle- to upper-middle-class families. School 2, with approximately 403 students, was located in a largely lower-class, industrial neighborhood. School 3, with approximately 329 students, was located in a lower- to lower-middle-class residential area.

Student-mediated Conflict Resolution Program

Selecting student mediators. Prior to the introduction of the mediation program, the training team presented the project to parents, teachers, and students. Although an effort was made to recruit mediators representing the gender and ethno-cultural makeup of the school, all 5th-grade students (approximately age 10) who obtained the permission of their parents participated in the training program. School 1's mediation team consisted of 9 boys and 19 girls, School 2's team consisted of 9 boys and 12 girls, and School 3's team consisted of 5 boys and 7 girls. The proportion of mediators from visible minorities was 14% in School 1, 42% in School 2, and 33% in School 3.

Training student mediators. Mediators participated in approximately 15 hours of training conducted by a team of school social workers and teachers. During the training program, leaders introduced the concepts of mediation, modeled the steps of the conflict resolution process, and conducted role-playing exercises allowing prospective mediators to rehearse newly acquired skills (Cunningham et al., 1997).

Introducing the mediation program. Following training, the mediation team was introduced at a school-wide assembly. School administrators discussed the importance of the program, mediators performed skits illustrating the dispute resolution process, and graduation certificates were awarded. Prior to the start of playground mediation, teams of three mediators met with each class, presented the goals of the program, and demonstrated the mediation process.

Playground mediation process. Student mediators were on the playground in teams of approximately eight per recess period with two mediators assigned to each playground quadrant. Mediators attempted to intervene within 10 seconds of the start of a conflict. If disputants agreed, mediation was conducted according to a standard protocol (Cunningham et al., 1997). Students choosing not to resolve a conflict via mediation were referred to the playground supervisor, who dealt with the incident according to the school's disciplinary code.

Supporting the mediation team. Prior to each recess period, the on-duty playground supervisors met briefly with the mediation team, reviewed the steps of the mediation process, and assigned pairs of mediators to separate quadrants of the

playground. In each school, at least two teachers, the Mediation Team Champions, assumed responsibility for the management of the program. Mediation Team Champions recruited mediators, participated in training sessions, conducted weekly team meetings, and trained the next year's team.

Integrity of the intervention. To ensure the integrity of the intervention (Moncher & Prinz, 1991), training was conducted according to a detailed manual (Cunningham et al., 1997) by school social workers with experience training more than 1000 mediators. Playground supervisors and Team Champions monitored the implementation of the program, provided feedback, and assisted in the solution of problems. Mediators carried a clipboard listing the types of behaviors targeted for mediation and outlining the steps of the dispute resolution process. To improve adherence, mediators checked off each step as it was completed. Members of the training team made unannounced visits to provide feedback and encourage adherence.

Experimental Design

This study employed a multiple baseline design (Barlow & Hersen, 1984), with weekly observations of physically aggressive behaviour in three schools serving as baselines. Following 7 weekly baseline observations, mediators began intervening in conflicts on the playground of School 1. Mediators began intervening in conflicts in School 2 following 11 weekly baseline observations. Mediation was introduced onto the playground of school 3 following 14 weekly baseline observations. Weekly observations were continued throughout the school year, with follow-up observations the following year.

The multiple baseline design of this study was selected as a controlled design (Barlow & Hersen, 1984), which adds substantially to the descriptive reports in this area. Second, given the absence of previous studies of student-mediated conflict resolution programs (Hundert, 1995), this design provides immediate and continuous feedback regarding outcome, multiple replications across schools, and the opportunity to explore controlling dimensions of the program via treatment reversals (Barlow & Hersen, 1984). Third, repeated weekly observations provided information regarding the program's time course, variability, and longer-term stability (Barlow & Hersen, 1984). Finally, the multiple baseline's sequential introduction of student mediation into a series of schools is a design that approximates the approach to program implementation adopted by many communities.

Dependent Measures

Direct observations. A team of three coders conducted observations once weekly during two 20-minute recess periods, with one observer assigned to each school. In general, observations were conducted at the same time, from the same location, by the same observer. If schools were closed or recesses were canceled, observations were conducted on the next available day. The following behaviors were recorded according to an interval procedure with 120 10-second coding intervals:

Physical aggression. This category included instances of physical aggression such as taking equipment from peers, pushing another student, or hitting. Since it was not possible for observers to detect relational or verbal aggression reliably in noisy playground contexts, only physical aggression was coded.

Adult intervention. Instances in which adults intervened to prevent or resolve conflicts.

Mediator monitoring. Mediators carried a clipboard with monitoring forms listing steps in the mediation process and a prompt sheet with examples of behaviors that warranted or did not require intervention. For each conflict in which they intervened, mediators recorded the gender and grade of the disputants, the nature of the conflict (physical versus verbal/relational), and whether the conflict was resolved successfully. Mediators coded physical conflict when disputants engaged in aggressive behavior with physical contact (attempting to take playground equipment from another child, pushing, or hitting). Physical conflict excluded contacts occurring in the normal course of playground games. Conflicts and aggressive behavior without physical contact (e.g. teasing or excluding a child from play) were coded as verbal/relational. A mediation was judged successful if: (1) both disputants agreed to mediate the conflict, (2) a solution was agreed on, and (3) the mediator felt the solution solved the problem.

Consumer satisfaction. Approximately 6 months after the program was introduced, the staff at each school anonymously completed a 26-item, 4-point Likert-scaled questionnaire evaluating the implementation, feasibility, acceptability, and outcome of the program. At the end of the year, mediators anonymously completed a similar 17-item, 5-point scale.

Reliability

Observers did not attend the mediation training program, were not told the identity of the mediators, were not informed when the school's mediation program started, were given no information regarding the playground quadrants to which mediators were deployed, and did not plot observational data. Before baseline data collection began, observers participated in 2 months of coder training and playground observation. Criterion reliability checks were conducted prior to the start of coding and eight maintenance reliability checks were completed during the course of the study. At each check, observers independently coded the same recess period. Criterion percentage agreement corrected for chance via Cohen's Kappa (Cohen, 1960) was .86 for coder 1, .86 for coder 2, and .88 for coder 3. Maintenance reliability check kappas averaged .90 for coder 1, .72 for coder 2, and .90 for coder 3. Meetings were conducted on a weekly basis to discuss coding definitions and resolve areas of disagreement.

Mediator monitoring forms were checked by playground supervisors, school Mediation Champions, and trainers. Probe interobserver reliability checks were conducted for 51 mediators from the respective schools. Two mediators independently completed monitoring forms on the same mediation. Excluding a small number (approximately 10%) of missing monitoring form entries, overall agreement on the outcome of mediation corrected for chance via Cohen's Kappa was .86. Agreement on the grade of the disputants, the gender of the disputants, and the type of dispute (physical vs. verbal/relational) was 1.00.

Results

We begin with a presentation of the results from mediator monitoring forms. Next, we present direct observations of physically aggressive playground behavior. Finally, we summarize the reports of teachers and mediators.

Mediator Monitoring Forms

The three mediation teams recorded 1010 mediations during year 1. Table 1 shows the number of disputes between boys, girls, and boys versus girls at grades 1 through 5 in which mediators intervened. Data for junior kindergarten (aged 3 to 5 years) and kindergarten students (aged 4 to 6 years), who were not consistently present at recess, are not included here. The number of

Table 1
Number of Mediations at Grades 1 to 5

	Grade				
	1	2	3	4	5
Two boys	117	95	76	58	49
Two girls	59	47	45	28	48
Boy vs. girl	67	71	46	38	26
Total	243	213	167	124	123

Table 2
Percentage of the Conflicts, Mediated by Boys and Girls, Which Involved Disputants Who Were Both Boys, Both Girls, or Boys and Girls

Mediator gender	Gender of disputants			χ^2	p
	Boys	Boy vs. Girl	Girls		
Verbal/Relational conflicts					
Boy	55.1	22.5	22.5	33.74	< .001
Girl	26.5	26.9	46.5		
Physical conflicts					
Boy	63.1	27.3	9.6	17.16	< .001
Girl	45.1	22.3	16.6		

mediations involving boys declined from 117 in grade 1 to 49 in grade 5. Mediations involving conflicts between boys and girls declined from 67 in grade 1 to 26 in grade 5. The number of mediations involving only girls, in contrast, remained relatively stable from grade 1 (59) to grade 5 (48).

The percentage of interventions in physical versus verbal/relational conflicts between boys, girls, or boys versus girls differed significantly, $\chi^2(2,903) = 66.41$, $p < .001$. Physical conflict prompted intervention in 61.5% of the disputes between boys and 56.7% of the conflicts between boys and girls. Only 29.1% of the conflicts mediated between girls were physically aggressive. For girls, 70.9% of the conflicts prompting intervention by the mediation team were verbally or relationally aggressive.

The percentage of disputes mediated by boys and girls did not differ significantly from the proportions predicted on the basis of their membership on the team, $\chi^2(1,878) = 0.0001$, $p = .99$. Boys made up 38% of the teams and conducted 42.9% of the mediations recorded. Girls made up 62% of the teams and conducted 57.1% of the mediations recorded.

For both verbal/relational, $\chi^2(2,383) = 33.74$, $p < .001$, and physical aggression, $\chi^2(2,404) = 17.16$, $p < .001$, mediators evidenced a significant gender preference (Table 2). Boys were more likely to intervene in disputes involving boys: 77.6% of the verbal/relational and 90.4% of the physical conflicts that boys mediated involved either boys or boys versus girls. Girls evidenced a similar, though less pronounced preference: 73.8% of the verbal/relational and 54.8% of the physical conflicts mediated by girls involved girls or girls versus boys.

The percentages of verbal/relational versus physical conflicts that boys and girls from the mediation team resolved successfully are presented in Table 3. Boys from the mediation team reported significantly less success intervening in physical conflicts between girls than boys, $\chi^2(1,198) = 5.19$, $p = .022$. Girls from the mediation team did not report significant differences in their efforts to resolve disputes between boys and girls, $\chi^2(1,56) = 1.053$, $p = .30$. The success of boys and girls who were mediators in attempting to resolve verbal/relational conflicts between boys, $\chi^2(1,131) = 0.89$, $p = .90$, girls, $\chi^2(1,130) = 0.24$, $p = .62$ or boys vs girls, $\chi^2(1,87) = 0.56$, $p = .46$, did not differ.

Table 3
Percentage of Physical and Verbal/Relational Conflicts, Mediated by Boys and Girls, Which Involved Disputants Who Were Both Boys, Both Girls, or Boys and Girls, and Were Resolved Successfully

Gender of disputants	Gender of mediator		χ^2	p
	Boys	Girls		
Physical conflicts				
Boys	92.0	81.2	5.19	.02
Girls	80.0	90.2	1.05	n.s.
Boy vs. girl	89.8	93.5	0.52	n.s.
Verbal/Relational conflicts				
Boys	92.9	93.4	0.02	n.s.
Girls	93.1	90.1	0.24	n.s.
Boy vs. girl	93.1	87.9	0.56	n.s.

Direct Observations

Weekly observations of physically aggressive playground behaviour are summarized in Fig. 1. In School 1, aggressive behavior remained stable for approximately 5 weeks. Rates dropped upon return from the winter break but increased linearly over the next 4 weeks. The introduction of mediation produced an abrupt and sustained drop in aggressive behavior, which declined from an average of 57% ($SD = 8.2$) of the 120 weekly baseline observation intervals to an average of 28% ($SD = 7.4$) of the observation intervals during mediation. On no occasion during the conduct of the mediation program did observations of aggressive behavior exceed baseline levels. Interventions by playground supervisors in School 1 averaged 0.9% of observed intervals during baseline and 1.1% of observed intervals during mediation.

The decline in aggressive behavior in School 1 was not associated with a decline in Schools 2 and 3. In School 2, aggression was observed in 81% of the intervals during the 3-week period before and 78% of the intervals after mediation was introduced in School 1. Figures for School 3 were 69% before and 62% after mediation was introduced in School 1.

Given the number of observations available, we adopted a simplified time series analysis (DeCarlo & Tryon, 1993; Tryon, 1982). An analysis of baseline data for School 1 revealed no significant baseline trend. Computation of the C statistic for the entire baseline and treatment data set (Tryon, 1982), in contrast, confirmed

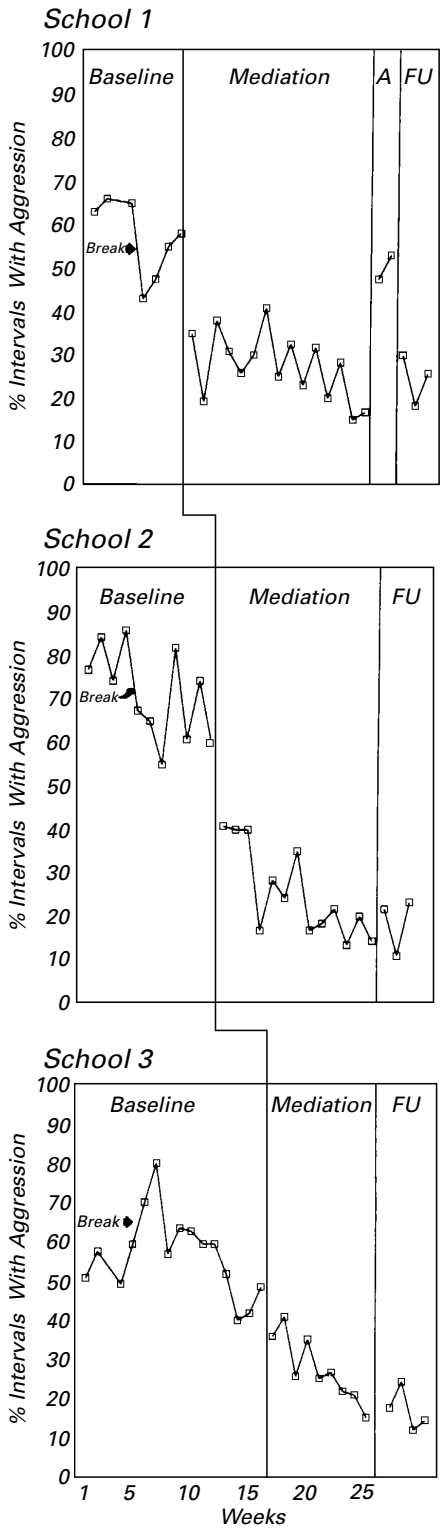

Figure 1. Percentage of 120 intervals in which physically aggressive behaviour was observed each week during baseline, mediation, and follow-up (FU) conditions at three primary division schools. "A" indicates a reversal when the mediation team was reduced from eight to two members.

the visual impression of a significant downward shift in the trend of the time series, $Z = 4.025$, $p < .01$.

In School 2, aggressive behavior remained stable for the first 4 baseline weeks, declined sharply following the winter break, but stabilized prior to the introduction of mediation. An analysis of baseline data confirmed the absence of a significant baseline trend. Mediation produced an abrupt reduction in direct observations of physically aggressive behaviour. Aggressive behavior declined from a baseline average of 71% ($SD = 9.95$) of the 120 observation intervals to an average of 25% ($SD = 9.9$) of the 120 observation intervals during mediation. Analysis of the entire baseline and treatment data set confirmed a significant downward shift in the time series trend, $Z = 4.315$, $p < .01$. On no occasion during the conduct of the mediation program did observations of aggressive behavior exceed baseline levels. Interventions by playground supervisors in School 2 declined from an average 15.6% of observed intervals during baseline to 2.7% of observed intervals during mediation.

Analysis of the baseline data in School 3 revealed a significant baseline trend, $Z = 2.33$, $p < .01$. Aggressive behavior declined from 57% ($SD = 10$) of the baseline intervals to an average 26% ($SD = 7.8$) of the intervals during mediation. Given a significant baseline trend, the numerator is computed by comparing sequential pairs of baseline and treatment plus follow-up points (Tryon, 1982). This analysis revealed that the introduction of mediation resulted in a significant downward shift in the baseline trend, $Z = 4.02$, $p < .01$. Adult interventions in School 3 average 2.7% of observed intervals during baseline and 3.4% of observed intervals during mediation.

Follow-up Observations

All schools reintroduced the mediation program in year 2. Follow-up observations are summarized in Fig. 1. In School 1, physically aggressive behavior was observed in 50.3% of the recording intervals, a level approaching the 57% baseline levels observed the preceding year. Playground observations and interviews revealed that the size of the team had been reduced to two mediators per recess period. When the school increased the complement of mediators to the program's recommended minimum of 8 (Cunningham et al., 1997), aggression declined to an average of 24.7% of the 3 weekly follow-up intervals. This is consistent with year end levels and 57% below the baseline levels observed at a similar point in the preceding school year.

In School 2, physical aggression was observed in 18.7% of the follow-up intervals, a level comparable to that achieved at the end of the preceding school year and 75% below the baseline levels observed the preceding year. Physically aggressive playground behavior occurred in 16.9% of the follow-up observation intervals at School 3, 70% below the baseline levels recorded the preceding year.

Teacher and Mediator Reports

Post-program teacher and mediator reports regarding the training and support, implementation, outcome, feasibility, and generalization of the mediation program are summarized below.

Training and support. School staff (93%) and mediators (93%) agreed that the program provided

Table 4
Average Scores for Mediators Who Planned or Planned Not to Join Middle-school Mediation Teams

	No/Uncertain ($N = 17$)		Continue ($N = 41$)		
Measure	Mean	*SD*	Mean	*SD*	*t*
Training and support					
I got enough training	3.6	0.9	3.8	0.8	0.66
Important to teachers	3.6	0.7	3.4	0.7	0.83
Teachers helped mediators	2.1	1.2	2.4	1.2	0.87
Mediation experience					
Fun being mediator	2.5	0.7	3.6	0.6	5.45***
Boring being a mediator	1.2	0.7	0.5	0.8	3.14**
I get in fewer conflicts	2.2	1.0	2.9	1.4	2.19*
Peer reaction					
Students liked mediators	2.1	1.0	2.5	1.2	1.46
Kids teased mediators	1.9	1.1	2.4	1.2	1.56
Perceived impact on school					
Kids fight less	2.2	1.2	3.5	0.9	4.05***
Schools safer	3.1	0.8	3.7	0.6	2.80**
Commitment to mediation					
All schools should have mediation	2.8	0.8	3.8	0.8	3.80***

* $p < .05$; ** $p < .01$; *** $p < .001$.

adequate training. Staff felt the program was adequately supervised (93%) and both staff (95%) and mediators (86%) felt the program was supported by teachers.

Implementation of mediation. Staff reported that mediators intervened when conflicts occurred (93%) and were successful in resolving student conflicts (98%). Staff felt that disputants cooperated with (96%), and sought the assistance of (91%), the mediation team.

Impact of the mediation program. Staff reports supported direct observations, with a majority (91%) noting that the mediation program reduced playground conflicts. Staff felt the mediation program made recess more positive (90%) and contributed to a general improvement in school atmosphere (79%). Most mediators (75%) felt the program reduced fights on the playground and made their schools safer (90%).

Generalization and maintenance. Although many staff (76%) noted a reduction in the number of conflicts brought to class, fewer (41%) felt the program reduced conflicts at other times during the school day. Most staff reported that the program increased their own use of mediation strategies (93%).

Impact on mediators. Staff (98%) felt mediators benefitted from participation in the program. Most mediators (76%) thought mediation was fun and none described participation as boring. A majority of mediators reported that participation in the program reduced (64%) or sometimes reduced (17%) the number of conflicts in which they became involved.

Feasibility and acceptability. Most staff (98%) felt that setting up the program was an effective use of the school consultant's time, and 93% judged the program to be manageable in school settings. Although students refusing mediation were referred to playground supervisors, staff (80%) reported an overall decline in the number of students disciplined at recess. Staff (97%) felt the program was supported by parents and all judged the program consistent with local school board and Provincial Ministry of Education policy.

Maintenance and dissemination of mediation. All staff supported continuation of their program and recommended student mediation to other schools. A considerable number of staff (73%) expressed a desire to become more involved in the mediation program. Mediators supported maintenance of the program (83%) and dissemination to other schools (86%).

Factors Influencing Commitment to Continued Participation

Mediators were divided into those interested in joining middle-school mediation teams and those who were uninterested in, or uncertain about, continued participation. Table 4 summarizes a series of *t*-tests examining factors linked to interest in joining the middle-school team. Mediators who planned to join middle-school teams found mediation to be more fun, less boring, more likely to contribute to a safe school, and more likely to have reduced their own interpersonal conflicts. Training, teacher support, and the response of peers were not linked to interest in continued participation. A sequential regression equation (Tabachnick & Fidel, 1996) suggested that enjoyment, perceived impact, and general commitment independently contributed to 52% of the variance in the decision to continue participation.

Discussion

Mediation produced an abrupt and sustained reduction in direct observations of physically aggressive playground behaviour. Follow-up observations suggest that these effects were evident the following year. Our discussion deals with the implementation, outcome, generalization, acceptability, and limitations of the study.

Implementation

Several lines of evidence suggest that the playground mediation program was implemented successfully. School staff and mediators agreed that the program provided adequate training and support. From 90% to 95% of staff felt that mediators intervened when conflicts were observed, an observation supported by monitoring forms recording a total of 1010 interventions.

Outcome of Mediation

Approximately 90% of the disputes in which mediators intervened were resolved successfully. Although judgements regarding the outcome of mediation are subject to informant bias, reliability checks suggest that these data are relatively accurate. Playground supervisors, moreover, confirmed that students cooperated with, and indeed sought assistance from, the mediation team. This level of success is consistent with descriptive accounts of the implementation of student mediation programs (Cameron & Dupuis, 1991; Schrumph et al., 1991).

The introduction of playground mediation reduced physically aggressive playground behavior by 51% to 65%. Staff reported a reduction in playground conflict and a decline in the number of children disciplined at recess. The multiple baseline design of this study, one unplanned reversal, and follow-up observations suggest that this decline in physically aggressive behaviour was not attributable to the passage of time or to extraneous events. Moreover, the impact of the student mediation program did not appear to be a result of an increase in adult intervention. As noted in previous studies (Craig & Pepler, 1996; Olweus, 1991, 1994), baseline intervention by playground supervisors was infrequent. With the introduction of the mediation program, the number of playground interventions by adults remained relatively stable in Schools 1 and 3 and declined sharply in School 2. School 2 evidenced the highest baseline levels and the greatest overall decline in aggressive behavior. This program did not, therefore, simply increase the disciplinary burden of playground supervisors. Indeed, many teachers felt the mediation program reduced the number of students disciplined during recess periods.

Maintenance and Generalization

The temporal stability of this program was strong. Staff were unanimous in recommending that the program be maintained. All schools selected and trained a second generation of mediators and reintroduced the program the following year. Direct observation showed that the reductions in physically aggressive playground behaviour achieved in year 1 were maintained in year 2.

This study provides evidence of a transfer of skills from the mediation program to staff members: 93% of staff reported using mediation strategies more frequently as a result of the program. In the absence of direct observations in other settings, the situational generality of playground mediation is less clear. Whereas most staff reported a reduction in the number of conflicts spilling over from the playground to the classroom, less than half felt that playground mediation reduced conflict at other times during the school day.

Acceptability

In addition to being effective, the maintenance and dissemination of interventions requires that they be consistent with administrative policy, acceptable to the community, manageable given limited time and resources, and affordable in an era of economic restraint (Hoagwood et al., 1995; Hundert, 1995; Offord, 1996). Staff rated student mediation as a logistically feasible program that was an effective use of school time. Student mediation was judged to be consistent with Ministry policy, supported by the Board of Education, and backed by parents. Student mediation was unanimously recommended to schools without the program. Since support for the program is strong, and many staff expressed an interest in becoming more involved, the prospect of sustaining mediation is high.

Impact on Mediators

Teachers reported that participation benefited mediators. Mediators reported that they engaged in less conflict as a result of their participation in the program, a finding consistent with previous studies (Gentry & Benenson, 1993; Johnson, Johnson, & Dudley, 1992; Johnson et al., 1992; Johnson, Johnson, Dudley, Ward, & Magnuson, 1995). Plans to join middle-school mediation teams the following year provide a measure of mediator satisfaction with the program. Mediators who enjoyed the experience, felt they had an impact on their schools, and reported a greater reduction in their own interpersonal conflict, were more committed to continued participation. Mediator's evaluations of the training they received, the support and assistance provided by teachers, and the reaction of peers were not linked to the decision to join a middle-school mediation team.

There are several mechanisms via which participation might be especially helpful to mediators with a history of interpersonal conflict and aggressive behaviour. First, playground mediation responsibilities reduce opportunities for aggressive behaviour during low-surveillance high-risk times (Fowler, Dougherty, Kirby, & Kohler, 1986). Second, training, weekly team meetings, and playground dispute resolution provide mediators with problem-solving, communication, and perspective-taking skills, which may assist in the resolution of conflicts with peers or improve responsiveness to adult interventions. Third, dispute resolution may alter hostile attributional biases that contribute to aggressive behaviour (Dodge, 1993; Dodge & Frame, 1982). Fourth, the skills, attitudes, and status mediators acquired may alter the aggressive child's reputation (Hymel, 1986; Hymel, Wagner, & Butler, 1990), reduce peer rejection (Dodge, 1983), and limit association with children who might contribute to more stable patterns of antisocial behaviour (Cairns et al., 1988; Coie, 1996; Patterson et al., 1992). Finally, middle and secondary school programs extend the impact of participation throughout the adolescent years. This is critical to the management of disorders that emerge at different stages (Moffitt, 1993; Patterson et al., 1992) and persist for many years (Offord et al., 1992).

Gender Effects

Despite an effort to recruit equal numbers of boys and girls, a greater number of girls joined the mediation team. Although boys and girls contributed equally to the team's efforts, they displayed distinct preferences: boys intervened in more disputes involving boys whereas girls intervened more frequently in conflicts between girls. There are several possible explanations for this finding. First, boys perceived their efforts to intervene in physical conflicts between girls to be somewhat less successful than their efforts with boys. Second, whereas most conflicts between boys were physical, girls were more likely to engage in verbal or relational aggression (Crick et al., 1996). Since boys are less likely to employ or be the targets of relational aggression (Crick et al., 1996; Crick & Grotpeter, 1995), they may be less likely to detect relationally aggressive interactions between girls. Third, relational aggression is more likely to compromise interpersonal goals, which are more important to girls than to boys (Crick & Grotpeter, 1995). If boys are less disturbed by relational aggression, they may assume that it does not warrant intervention.

Limitations

Despite strong support, follow-up observations reveal a potential problem in the sustained implementation of this type of school-based program. When School 1 reduced the on-duty team to two mediators per recess period, physical aggression returned to baseline levels. When the size of the team was increased to eight mediators (two per playground quadrant), physically aggressive behavior declined abruptly. Although physical aggression increased to baseline levels when the size of the mediation team was reduced, staff felt the program was working effectively. Since teachers fail to detect most playground conflicts (Craig & Pepler, 1996; Olweus, 1991), they may have difficulty evaluating the impact of their school's mediation program. Research identifying factors influencing the outcome of student mediation and establishing minimum program standards is needed (Clarke, 1995).

Several limitations to this study need to be considered. First, although mediations declined across grades 1 through 5, the study design cannot determine whether this represented a reduction in playground aggression or a preference for interventions with young children. Previous studies suggest that, whereas the number of students engaging in aggressive behaviour remains relatively constant, younger students are the potential victims of older children at every grade level (Olweus, 1991, 1994; Whitney & Smith, 1993). The percentage of students who are victims, therefore, declines across grades (Olweus, 1991, 1994; Whitney & Smith, 1993).

Although we kept observers uninformed with respect to the introduction of mediation, did not allow observers access to plotted data, and conducted reliability checks, it is possible that the activity of mediators may have influenced observational data. Nonetheless, observational data were supported by several sources of information: teacher reports, mediator reports, and records of successful conflict resolution.

Second, while the multiple baseline design provided what we believe to be the first controlled trial of student mediation, the small number of schools involved limits generalization. Although these schools represented a broad spectrum of socioeconomic and sociocultural backgrounds, larger-scale randomized trials are necessary to establish the utilization and efficacy of student-mediated conflict resolution programs.

Third, although student mediation programs have been conducted in middle and secondary schools (Cameron & Dupuis, 1991), the results of this study are restricted to primary division students.

Finally, although observers detected a reduction in aggregate levels of playground aggression, the impact of this program on children with more serious conduct problems is not clear. Although student mediation is a universal intervention that avoids the consequences of screening errors (Coie, 1996; Lochman & The Conduct Problems Prevention Research Group, 1995; Offord, 1996), the program's focus on actual conflicts provides aggressive children with additional dispute resolution practice, which may enhance conflict resolution skills and strengthen social relationships (Nelson & Aboud, 1985).

In conclusion, student mediators reduced physically aggressive behavior during low-surveillance recess periods (Craig & Pepler, 1996; Olweus, 1991). Mediators were able to detect conflict quickly and intervene before disputes escalated to more serious aggressive incidents. In contrast to programs requiring parental participation, which fail to reach many high-risk children (Cunningham, et al., 1995), mediation is a universal program with potential benefits to both students and staff. As a relatively low-cost intervention, which can be sustained throughout the middle and secondary school years, it merits further study as a component of a wider school-based antiviolence program (Olweus, 1991, 1993, 1994; Sharp & Smith, 1991; Smith & Sharp, 1994).

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