



Contents lists available at ScienceDirect

Child Abuse & Neglect



Impact of a universal school-based violence prevention program on violent delinquency: Distinctive benefits for youth with maltreatment histories[☆]

Claire V. Crooks^{a,*}, Katreena Scott^b, Wendy Ellis^c, David A. Wolfe^{a,d}

^a CAMH Centre for Prevention Science, 100 Collip Circle, Ste. 100, London, Ontario N69 4X8, Canada

^b The Department of Human Development and Applied Psychology at Ontario Institute for Studies in Education of The University of Toronto (OISE/University of Toronto), Toronto, Ontario, Canada

^c King's University College at The University of Western Ontario, London, Ontario, Canada

^d University of Toronto, Toronto, Ontario, Canada

ARTICLE INFO

Article history:

Received 18 February 2011

Received in revised form 17 March 2011

Accepted 22 March 2011

Available online 8 June 2011

Keywords:

Child maltreatment

Delinquency

School-based prevention

Youth violence

Multilevel modeling

ABSTRACT

Objective: Child maltreatment constitutes a strong risk factor for violent delinquency in adolescence, with cumulative experiences of maltreatment creating increasingly greater risk. Our previous work demonstrated that a universal school-based violence prevention program could provide a protective impact for youth at risk for violent delinquency due to child maltreatment history. In this study we conducted a follow-up to determine if participation in a school-based violence prevention program in grade 9 continued to provide a buffering effect on engaging in acts of violent delinquency for maltreated youth, 2 years post-intervention.

Methods: Secondary analyses were conducted using data from a cluster randomized controlled trial of a comprehensive school-based violence prevention program. Students ($N = 1,722$; 52.8% female) from 20 schools participated in 21 75-min lessons in grade 9 health classes. Individual data (i.e., gender, child maltreatment experiences, and violent delinquency in grade 9) and school-level data (i.e., student perception of safety averaged across students in each school) were entered in a multilevel model to predict violent delinquency at the end of grade 11.

Results: Individual- and school-level factors predicting violent delinquency in grade 11 replicated previous findings from grade 9: being male, experiencing child maltreatment, being violent in grade 9, and attending a school with a lower perceived sense of safety among the entire student body increased violent delinquency. The cross-level interaction of individual maltreatment history and school-level intervention was also replicated: in non-intervention schools, youth with more maltreatment in their background were increasingly likely to engage in violent delinquency. The strength of this relationship was significantly attenuated in intervention schools.

Conclusions: Follow-up findings are consistent with the buffering effect of the prevention program previously found post-intervention for the subsample of youth with maltreatment histories.

Practice implications: A relative inexpensive school-based violence prevention program that has been shown to reduce dating violence among the whole student body also creates a protective effect for maltreated youth with respect to lowering their likelihood of engaging in violent delinquency.

© 2011 Elsevier Ltd. All rights reserved.

[☆] The RCT from which these data were drawn was funded by a grant to C.C. and D.W. from the Canadian Institutes of Health Research.

* Corresponding author.

Introduction

Child maltreatment interferes with healthy development and contributes to a range of negative psychological and physical health outcomes (Kim, Cicchetti, Rogosch, & Manly, 2009). Children who experience abuse are more likely to be diagnosed with a psychological disorder and to show difficulties with early attachment, emotional regulation, peer relationships, school adjustment, and pro-social behaviors (Cyr, Euser, Bakermans-Kranenburg, & Van Ijzendoorn, 2010; Wekerle & Wolfe, 2003). Child maltreatment history raises the risk of numerous health-risk behaviors such as smoking, substance use, and early and promiscuous sexuality (Dube et al., 2006; Edwards, Dube, Felitti, & Anda, 2007; Hussey, Chang, & Kotch, 2006), and substantially increases risk for delinquent and violent behaviors (Lansford et al., 2007; Maas, Herrenkohl, & Sousa, 2008). The relationship between child maltreatment and delinquency suggests that severe or cumulative experiences of child maltreatment are particularly detrimental with respect to future conduct (Maas et al., 2008; Margolin et al., 2009).

It is clear that experiences of child abuse and maltreatment show a dosage effect. That is, a greater number of abuse experiences and types exert an increasingly more detrimental impact. The Adverse Childhood Experiences Study (Felitti et al., 1998) utilized a sample of more than 8,500 adults accessed through a large HMO and found a dosage–response relationship between experiences of childhood maltreatment and other adverse effects (such as parental incarceration, mental health problems, and/or substance abuse, parental separation or divorce), and a wide range of physical and mental health outcomes including heart disease, cancer, and liver disease. In some areas of health, experiences of abuse eclipse associations previously attributed to certain causes. For example, the negative psychosocial sequelae and fetal deaths commonly attributed to adolescent pregnancy seem to result from underlying adverse childhood experiences rather than adolescent pregnancy *per se* (Hillis et al., 2004). The mechanisms by which adverse childhood experiences lead to poor pregnancy and birth outcomes remains to be clarified, and may include mechanisms such as low self-efficacy, high stress, and difficulties with anger, all of which could interfere with accessing good prenatal care.

Beyond physical health outcomes, multiple forms of abuse had a cumulative effect in predicting anger and hostility among a sample of 554 youth (Teicher, Samson, Polcari, & McGreenery, 2006). Poly-victimization has been shown to predict higher rates of psychiatric disorders in a nationally representative sample of more than 2,000 youth in the United States aged 2–17 (Finkelhor, Ormrod, & Turner, 2007), as well as higher rates of delinquency, independent of diagnoses of depressive, posttraumatic, and substance use disorders (Ford, Elhai, Connor, & Frueh, 2010). At the extreme end of the dosage continuum, some researchers and policy makers have contended that severe, early, chronic experiences of abuse and neglect may lead to the profound damage in psychological development that, in turn, sets the context for the perpetration of severe and lethal violence against others (Garbarino, 1999; Karr-Morse & Wiley, 1997).

Child maltreatment extends well beyond the cases known to child protection agencies and 21.9% of youth in aforementioned nationally representative sample have experienced some form of child maltreatment and/or witnessed domestic violence (Finkelhor, Ormrod, & Turner, 2009). Accordingly, universal prevention has been touted as an essential yet under-utilized component of a comprehensive intervention and prevention strategy (Chaffin & Schmidt, 2006; Hammond, Haegerich, & Saul, 2009). In addition to universal prevention initiatives provided to all individuals regardless of risk level, selected and indicated prevention are also important for maltreated children who may require specialized programming (Wolfe et al., 2003).

The Fourth R is a universal approach to the prevention that focuses on the underlying relationship dynamics common to dating violence, unsafe sex, substance use, and peer violence (Wolfe, Jaffe, & Crooks, 2006; see www.youthrelationships.org for more program information). The cornerstone of the program is a 21-session classroom-based curriculum that emphasizes knowledge, awareness, and skill development pertaining to developmentally relevant issues of personal safety in relationships, sexual health, and substance use. The focus on skill development through role play exercises that break complex skills down into manageable segments is a particularly unique aspect. As part of a comprehensive, universal prevention strategy, the lessons are taught by trained classroom teachers and fulfill state/provincial curriculum requirements. Other components include a Youth Action Committee that conducts school-wide awareness campaigns and prevention activities, extensive teacher training, and parent information.

The Fourth R has been demonstrated to provide a protective effect on delinquency for maltreated youth at post-test. Using data from our cluster randomized controlled trial of the Fourth R with students from 20 schools, we found student perception of safety (aggregated at the school level) predicted lower rates of delinquency over and above all individual-level predictors at the end of grade 9 (Crooks, Scott, Wolfe, Chiodo, & Killip, 2007). Furthermore, being a Fourth R intervention school buffered the impact of child maltreatment history on the development of violent delinquency. This school-level moderating effect among youth with maltreatment backgrounds was unexpected because schools had implemented the prevention program for only 1 year. In addition to this benefit for youth with maltreatment histories, the Fourth R conferred positive benefits on behavior among the whole sample. At 2 year follow-up, the Fourth R was found to significantly reduce dating violence and increase condom use among students, relative to peers attending control schools who received regular health class (Wolfe, Crooks, Chiodo, & Jaffe, 2009). Reductions in substance use were not found among the full sample.

In their call for research identifying potentially protective contexts, Foster and Brooks-Gunn (2009) identified our previous study of predictors of violent delinquency as one of the few examples to date to investigate school level effects as a moderator of the impact of child maltreatment. Due to this scarcity of research identifying contextual influences on maltreated youth, the question of duration of the protective impact on the subsample of youth with self-identified histories of child maltreatment is paramount. Therefore, the purpose of this study is to examine the stability of these effects 2 years later. That is, does

dosage of child maltreatment have the same exponential relationship to perpetration of violent delinquency for youth by the end of grade 11 as it did at the end of grade 9? Also, does participation in a comprehensive violence prevention program in grade 9 continue to provide a buffering effect for maltreated youth at the end of grade 11?

Methods

Participants

This study was conducted in compliance with research ethics boards of the Centre for Addiction and Mental Health and The University of Western Ontario. This study was conducted in schools in Southwestern Ontario, Canada from September 2004 to May 2007. Schools were recruited June 2003 from a large public board serving over 80,000 students and containing 30 secondary schools located in rural and urban areas. Eligible schools had general student populations and principals' agreement to randomization, teacher training, delivery of the assigned intervention, evaluation, restriction of similar programs during delivery, and were not involved in the development phase of the program.

Twenty high schools met eligibility conditions and were randomly assigned to intervention or control on the basis of a coin toss in the presence of an educator and co-investigators. Students in intervention schools received the program regardless of research consent because it fulfilled curriculum requirements and was adopted at the school level. Teachers and principals were partially blinded, that is, they were aware of school assignment but not aware of study hypotheses. Students in 81 mostly gender-segregated classrooms (male = 37; female = 36; mixed = 8 classrooms; M students per class = 20.91, SD = 4.55) within schools were the unit of analysis.

Usable surveys from 1,722 (52.8% female) grade 9 students at pre-test were gathered; 88% of the sample provided follow-up data 2.5 years later in grade 11 (n = 1,520; 655 control; 865 intervention). The follow-up sample did not differ from the pre-test sample on self-reported rates of problem behaviors at time 1 (i.e., violence, substance use, and sexual intercourse). There were significantly more girls (57%) in comparison than intervention schools (50%), and significantly more boys in intervention (50%) than comparison schools (43%; X^2 = 6.81; df = 1, p < .01). The majority of students described themselves as White (88%); other ethnic identities included Asian (4%), Arabic (2%), African (0.7%), Hispanic/Latino (0.6%), or Other (4%).

Measures

A self-report survey was conducted online in school computer rooms under teacher and research assistant supervision. The current analyses focused only on those variables that had previously predicted violent delinquency in multi-level modeling at the end of grade 9 (Crooks, Scott, et al., 2007; Crooks, Wolfe, & Jaffe, 2007). Each is described below. Child maltreatment, school safety and time 1 delinquency were included in the assessment of students during the fall of grade 9. Time 2 delinquency was measured as part of a longer survey of outcomes administered during the spring of grade 11.

Violent delinquency. Youth completed a delinquent behavior inventory developed by the National Longitudinal Survey of Children and Youth (NLSCY; Human Resources Development Canada, 2001). Eight items were selected from the larger inventory to reflect engagement in violent delinquency over the past 3 months: (1) fought with someone to the point where they needed care for their injuries; (2) been in a fight where you hit someone with something other than your hands; (3) carried a knife for the purpose of defending yourself or using it in a fight; (4) carried a gun other than for hunting or target shooting; (5) carried any other weapon such as a stick or club; (6) threatened someone in order to get their money or things; (7) tried to force someone to have sex with you; and, (8) set fire on purpose to a building, car, or something else not belonging to you. Youth who reported engaging in 2 or more of these behaviors were classified as exhibiting violent delinquency (time 1 n = 233, 13.0% of the sample, time 2 n = 158, 9.6% of the sample). By stipulating 2 forms of violent delinquency, we have omitted those youth who may have considered or dabbled in violent delinquency (i.e., carried a weapon in self-defense or carried a weapon but not used it). Furthermore, using a cut-off of 2 produced 2 very different groups. Youth classified in the violent delinquent group reported engaging in an average of 4.17 (SD = 2.15) of the possible 8 violent acts included on this list, compared to youth classified as nondelinquent, who on average had engaged in 0.14 (SD = 0.35) acts. Thus, the youth classified as delinquent in this study clearly represent a subset of adolescents engaging in alarming levels of violent behavior and are not those youth who have only participated in 1 anomalous incident of violent behavior.

Child maltreatment. Experiences of maltreatment were assessed with the Childhood Trauma Questionnaire (CTQ; Bernstein, Ahluvalia, Pogge, & Handelsman, 1997). The CTQ (short form) contains 35 items concerning the frequency (1 = "never true" to 5 = "very often true") with which the respondent experienced emotional, physical and sexual abuse and emotional neglect "while you were growing up." Five additional items were added in the current study to assess exposure to domestic violence as an additional form of maltreatment. Using the clinical cutoff groupings reported by Bernstein et al. (1997), neglect was the most common form of maltreatment reported, with 21% of the sample classified as having moderate/severe maltreatment in their childhood. Emotional abuse (16%), sexual abuse (11%), exposure to domestic violence (12%) and physical abuse (7%) were all also fairly common. Based on cutoff scores, 20% of youth reported experiencing 1 type of childhood maltreatment; 10% reported experiencing 2 types; and 4%, 3%, and 2% reported experiencing 3, 4, and all 5 types of childhood maltreatment, respectively. Students were coded (0, 1, 2, 3) based on having experienced 0, 1, 2, or 3 or more types of maltreatment.

School variables. Schools were coded as control ($n = 10$) or intervention ($n = 10$) based on random assignment.

Student perception of school safety. School-level data were collected from all grade 9–12 students in all 20 schools at the end of the first year of the study as a part of a separate school wide study. Students attending these 20 schools reported their feelings of safety in 12 different locations in their school (e.g., cafeteria, locker room) on a 4-point scale (0 = very unsafe; 4 = very safe; Thames Valley District School Board Research and Assessment Services, 2005). School safety ratings were averaged across students in each school and converted to a school-level z-score.

Procedures

All students in the intervention condition were exposed to the Fourth R program in their 9th grade health class as part of the required curriculum. The research component (i.e., on-line surveys) was explained by a research assistant to each class and information sheets and consent/assent forms were distributed to take home. The baseline parent consent/youth assent rates for intervention schools was 78%, with a combined returned rate (consent yes and no's) of 87%. The baseline parent consent/youth assent rates for control schools were somewhat lower, 70%, with a combined return rate of 77%. There were no significant differences between male and female consent rates across conditions ($X^2 = 3.18$, $df = 1$, ns).

Participants completed an online self-report survey at baseline (September–October, 2004), post-intervention (April–May, 2005), and 2-year follow-up (April–May, 2007), under supervision by research staff and teachers during a 75-min class period in the computer room. Students were assured confidentiality and entered a unique identifier number to access an online survey. Teachers were present consistent with school regulations, but remained at the front of the class and did not answer questions or position themselves to see students' computer monitors.

Intervention condition: Fourth R. The Fourth R involves an intensive classroom-based curriculum component, and to a lesser degree peer, school, and parental components. Classroom-level intervention was a 21-lesson curriculum with complete lesson plans, video resources, role-play exercises, rubrics, and handouts. It meets provincially mandated education requirements in Ontario and therefore was taught as part of the regular health class without requiring additional class time, scheduling, or human resources. The curriculum comprises 3 units containing 7 75-min classes each: (1) Personal safety and injury prevention; (2) Healthy growth and sexuality; and (3) Substance use and abuse, delivered by teachers in Grade 9 Physical and Health Education classes. The intervention was designed to present accurate information in an interesting and engaging format, to enhance youth motivation, and to teach (with guided practice) skills that promote healthy relationships and reduce conflict and risk behaviors. It extends beyond traditional didactic approaches to include strategies that have been successfully used to address adolescent risk behaviors, such as skills related to negotiation, delay, and refusal (Botvin & Griffin, 2002).

To illustrate, the intervention engages students with exercises to define healthy relationships and asks them to consider the rights and responsibilities associated with relationships. The curriculum includes many examples of the type of conflicts faced by teens daily, and peer and dating examples are used concurrently (where possible) so that youth who are not dating will find the material relevant. The program uses extensive role play instruction, with feedback from peers and teachers, to increase interpersonal skills and problem-solving. As well, the program takes a gender strategic approach (Crooks, Wolfe, et al., 2007). For example, it involves slightly different exercises and activities for boys and girls, which are intended to raise their level of awareness and minimize gender-based defensive or hostile reactions. These gender specific exercises were facilitated by the program being delivered in gender segregated classroom. In mixed-gender classrooms these exercises were conducted in gender segregated groups, and in some cases a full group discussion was convened once the gender specific exercises were complete.

The program was implemented by 40 teachers (55% male) with specialization in health and physical education. Teachers indicated the following age ranges (20% were 20–29, 35% were 30–39, 40% were 40–49, and 5% were 50–59) and years of experience (20% had less than 2 years of experience, 15% had 3–5 years, 25% had 6–10 years and 40% had more than 10 years). Teachers participated in a 1-day training workshop to become familiar with the 21-lesson curriculum and to learn effective skill-building exercises to move students from simple to more advanced skills. Teachers implemented the curriculum in their classrooms for 1 year prior to the study and were offered support from a teacher with 25 years of experience who assisted in developing the program. Because variations in implementation are expected in effectiveness trials (Kellam & Langevin, 2003), classroom sessions were not observed to avoid influencing program delivery and to allow the program to be delivered by teachers under “real world” conditions. Compliance was tracked by teacher self-report during the implementation year and the evaluation year and 89% of the lessons were completed (89%, 88%, 90%, for units 1, 2, and 3 respectively). Reasons for incompleteness included lack of time, technical problems/materials unavailable, or other school activities interfering with the schedule.

Peer- and school-level components included a Youth Safe Schools Committee (YSSC) in each school, which involved a group of students spanning all grades and a facilitator teacher discussing and addressing school safety and related youth concerns. All intervention schools received a YSSC manual to assist teachers and student leaders in establishing the committee. A central function of the YSSC was to increase activities between community agencies and the school, such as guest speakers, field trips, community resources, and/or volunteer involvement. Parents received information about the program during grade 9 orientation as well as 4 newsletters over the term describing the overall program and providing tips for parents about the issues being discussed in class. The main goal of the parent component was to provide information and create opportunities for communication between adolescents and parents.

Table 1
Individual, school and cross-level predictors of violent delinquency.

Variable	Coefficient (B)	Standard error (SE B)	Odds ratio (95% CI)	t-ratio
Intercept	−2.81	0.13	.06 (.04–.08)	−20.25**
<i>Level 1: Model of Student predictors</i>				
Gender	1.54	0.25	4.67 (2.85–7.65)	6.12**
Maltreatment	0.38	0.10	1.46 (1.21–1.78)	3.86**
Violent delinquency (grade 9)	0.54	0.07	1.72 (1.49–1.99)	7.46**
<i>Level 2: Model of School predictors of intercept</i>				
Intervention Condition	−0.09	0.22	.91 (.56–1.48)	−0.40
Safety	−0.36	0.11	.70 (.56–.87)	−3.39**
<i>Cross-level interaction</i>				
Condition × Maltreatment	−0.41	0.19	.66 (.46–.97)	−2.11*

df = 1,429, 19.

* $p < .05$.

** $p < .01$.

Control condition: Standard curriculum. The standard educational guidelines of the provincial Ministry of Education for Grade 9 Health and Physical Education (in place since 2000) formed a naturalistic comparison condition (<http://www.edu.gov.on.ca/eng/curriculum/secondary/health.html>). The Ministry standards require that all grade 9 students receive education in the areas of safety and violence prevention, substance use, and sexual health, and the number of instruction hours is specified. It is important to note that the expectations are framed in general terms rather than specific activities or lesson plans. Teachers in control schools were expected to teach 21 required lessons covering the same 3 units as intervention schools. However, teachers in control schools had no training or background on these topics or access to a structured curriculum emphasizing relationship skills for preventing violence and risk behaviors. Furthermore, although the Ministry guidelines are considered requirements, there is no monitoring or enforcement and it is largely up to individual teachers to decide what to teach, particularly in areas such as health, where there is no standardized testing. As a result, most health classes in the comparison condition involved didactic instruction and guest lectures, with little or no modeling, practice, or feedback on important decision-making skills.

Results

On average, 9.6% of grade 11 students across our sample of 20 schools were classified as having engaged in violent delinquency; however, rates varied considerably by school (ranging from 2% to 32%). In the 3 least delinquent schools, 5% or fewer grade 11 students were classified as engaging in violent delinquent acts (2%, 4%, 5%). In contrast, the proportion of violent delinquent students at 3 schools exceeded 16%, reaching a rate of 32% in 1 school.

We began our analysis of the effect of individual and school-level variance on acts of violent delinquency by estimating an unconditional model within HLM. This model predicts the outcome within each level 1 unit (i.e., student) with just 1 level 2 parameter—the intercept (in this case, the adjusted average engagement in violence delinquency across schools). It also allows for partitioning variance into within- and between-school components. Results indicated an adjusted average engagement in violent delinquency of 9.45 across schools, $1/[1 + \exp(2.26)]$. The estimated variance of the intercept term was modest (.04), but indicated that school-level variation in rates of violent delinquency was worth modeling; $\chi^2(19) = 23.91$, $p = .20$.

The next step of the analysis added student-level predictors (i.e., childhood maltreatment, grade 9 delinquency, gender) to the model. Effects for all variables except childhood history of maltreatment were fixed (i.e., constrained to be the same across all schools) and centered around the grand mean. The slope for childhood maltreatment was left random to allow examination of between-school variation in the association between childhood maltreatment and violent delinquency and to investigate school-level predictors of such variation. Results showed that sex of student, time 1 delinquency, and maltreatment history predicted individual variation in the chances of engaging in violent delinquency (details reported in final model). With these individual-level predictors, the residual variance associated with the intercept was .07; $\chi^2(19, n = 1,450) = 26.02$, $p = .13$. Residual variance associated with maltreatment was modest at .12, $\chi^2(19) = 28.15$, $p = .08$ indicating that additional modeling was warranted.

In an attempt to replicate our previous findings at follow-up, a level 2 model was specified with the 3 individual-level predictors (gender, grade 9 delinquency, and childhood history of maltreatment) and with 2 school-level predictors (perceived safety, intervention status) added to both the intercept and to the freed child maltreatment term (see Table 1). This allowed us to estimate both school-level predictors of violent delinquency (adjusting for individual-level characteristics) and to determine whether the relationship between childhood maltreatment and subsequent violent delinquency varied depending on the characteristics of the school in which youth were enrolled (again, adjusting for individual-level characteristics). Due to the relatively low variance associated with maltreatment between schools, models were estimated with and without freeing this parameter. Because no significant differences were found between models the fixed model was retained [deviance = 275.01, $\chi^2(2) = 2.64$, ns]. Results showed significant effects for both individual and school-level variables. At level 1 and controlling for all other factors, boys were 4.67 times more likely to engage in violent delinquency than were girls.

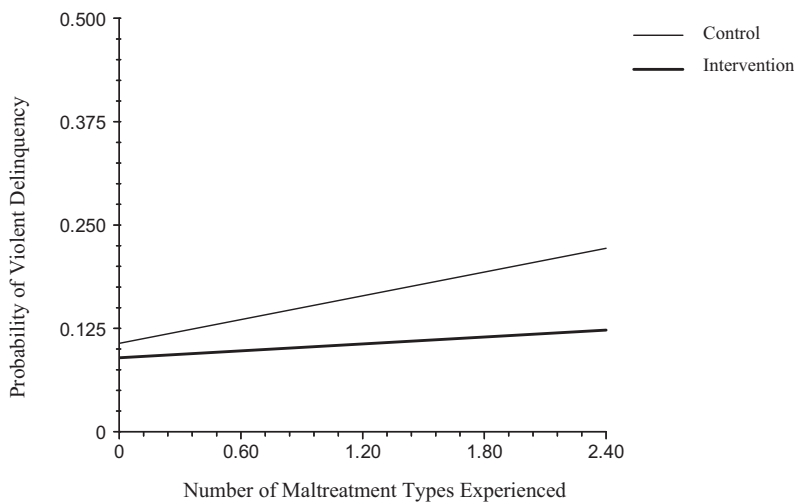


Fig. 1. Cross level interaction of child maltreatment and intervention condition on probability of violent delinquency (two years post-intervention).

Childhood maltreatment was also significant, with each additional type of maltreatment increasing the relative odds of engagement in violent delinquency by 46%. Unsurprisingly, violent delinquency in grade 9 predicted violent delinquency in grade 11. Odds of violent delinquency in grade 11 were 72% higher for youth who had reported such acts in grade 9, holding all other variables constant.

There were 2 significant effects at the school level. First, rates of violent delinquency varied according to school-level perceived safety. Specifically, each standard deviation increase in perceived safety was associated with a 30% decrease in the odds of perpetrating violent delinquency, holding all other variables constant. In other words, Given the same individual profiles or risk, students were more likely to engage in violent delinquency if they were attending a school perceived by the entire student body as an “unsafe” climate than if they were attending a school perceived as a “safe” climate.

Second, a cross-level interaction was found between childhood maltreatment and intervention condition. As shown in Fig. 1, the risk of violent delinquency associated with cumulative types of child maltreatment was lower in intervention schools than in control schools. Solving for the equations, we see that for a child in the control group, each additional form of child maltreatment yields a 46% higher chance of engaging in violent delinquency [$\exp(.38 + 0)$]. In comparison, the effect of an increase in forms of child maltreatment on violent delinquency for a child in an intervention school is negligible delinquency (reduce risk by 3%); [$\exp(.38 - .41)$]. With these predictors in the model, the amount of variation (.0007) was reduced by 99% to a non-significant level [$\chi^2(17) = 10.36, p > .50$], indicating that no further modeling was warranted.

Discussion

These results confirm previous findings indicating that youth with a history of childhood maltreatment report engaging in more violent acts in adolescence; however, this pattern can be attenuated by school-based efforts to promote healthy, non-violent relationships through curriculum and related school activities.

One optimistic implication of these findings is the stability of a strong buffering impact, even with relatively short-term and inexpensive programming. A widely held tenet of prevention programming is that more sustained programming (often in the form of an initial program and subsequent boosters) leads to more stable positive outcomes (Nation et al., 2003). However, more is not always better; for example, booster sessions did not improve the effectiveness of the Safe Dates dating violence prevention program (Foshee et al., 2004). The current study demonstrates that a classroom-based intervention in grade 9 continues to provide a buffering impact for maltreated youth at the end of grade 11 with respect to their engagement in violent delinquency, without additional booster sessions.

The differential impact of this program on youth with child maltreatment histories may be due to the emphasis on healthy relationships and positive relationship skills, and on the resulting focus on safe and respectful behavior in the school (Cicchetti & Valentino, 2006; Lansford et al., 2002; Wekerle & Wolfe, 2003). Youth who have been raised in safe and predictable environments enter this developmental period with the foundation for developing healthy, non-violent adolescent relationships. In contrast, youth who have experienced maltreatment and been exposed to violent, coercive models of relationships in their families may not have learned healthy alternatives (Wolfe et al., 2003). These are the youth for whom opportunities to learn healthy, non-violent relationship skills and to attend school in an environment where these skills are emphasized are essential.

Current results are also consistent with a growing body of literature documenting a buffering impact of school environment on outcomes, particularly for high-risk children and youth. For example, curriculum structure has a stronger positive effect on the upward mobility of disadvantaged students than advantaged students (Hao & Pong, 2008). School-

level moderating effects have also been shown for adolescent substance use. Specifically, in schools with a higher sense of community, relationships between peer influence and adolescent alcohol, marijuana and cigarette use were attenuated (Mayberry, Espelage, & Koenig, 2009). These studies confirm the importance of school level variables, and suggest that such variables are of particular importance to youth who may be at higher risk for negative outcomes.

The limitations of this study include several measurement challenges. First, child maltreatment was assessed retrospectively through adolescent self-report. Prospective multi-informant assessment would have been preferable. Second, the maltreatment dimensions do not take severity, chronicity or context of the maltreatment into account. Some researchers have underscored the importance of considering when abuse began and across which developmental stage(s) it extended in predicting outcomes (Lansford et al., 2007; Stewart, Livingston, & Dennison, 2008). Furthermore, different patterns across types of abuse have been shown to lead to different outcomes (Nooner et al., 2010). Third, perpetration of violent delinquency was based on self-report. Because the measure was chosen to match a national survey, it did not offer much complexity in the way of measurement. Similarly, implementation fidelity was based on teacher self-report (measured by checklists completed after each class) and this method is likely less reliable than other approaches to tracking fidelity of implementation. However, consistent with an effectiveness trial, the decision to rely on a potentially less reliable estimate of fidelity was made due to concern that more obtrusive measures of fidelity tacking (such as videotaping or observers) would create an effect on those implementing the intervention. Thus, on 1 hand there are limitations with knowing exactly how the classes were conducted, but on the other hand, we do know that the teachers were trained, they reported implementing 88%+ of the lessons, and there were positive effects for students in the program.

Two other challenges relate to the generalizability of the findings. The model that emerged in this study is largely a model for boys based on the comparative base rates for delinquency in our sample. There is some evidence that there might be important differences in the associations between maltreatment and delinquency for girls (e.g., the important role of sexual abuse, see Hahm, Lee, Ozonoff, & Wert, 2010). Because violent delinquency is much more common among males, the ability to identify girl-specific pathways depends on samples that are very large, court-referred, or both (Johansson & Kempf-Leonard, 2009). The other issue of interpretability relates to highly vulnerable populations such as those not attending schools or among more marginalized ethnic groups, as this sample was school-based and mostly Caucasian.

Overall, the findings of this study underscore the importance of investigating possible moderator effects, even in the absence of a main intervention effect. In our study there was not a significant main effect for reducing youths' violent delinquency based on schools' participation in the comprehensive prevention program, although there was a trend in this direction. However, this study (and the previous study based on post-test findings; Crooks, Scott, et al., 2007; Crooks, Wolfe, et al., 2007) demonstrates that the impact of the program on violent delinquency is differentiated depending on the child maltreatment status of the youth. As these results show (in combination with the findings of our RCT; Wolfe, Crooks, Chiodo, et al., 2009, a program designed for all youth in a particular setting may affect various subpopulations of youth differently. More specifically, the Fourth R program delivered in a universal context demonstrated benefits for the whole sample (i.e., universal prevention) as well as benefits for an at-risk population (i.e., secondary or indicated prevention). In these times of decreasing resources for schools, there is a need to develop and evaluate programs that have multiple beneficial impacts for the entire student body, as well as more vulnerable subgroups.

Clearly schools play a critical role in developing healthy relationships and decreasing violence for high- and low-risk youth and there are low-cost ways to increase their capacity to do so. Given the long-term emotional and economic costs associated with violence, it is essential that schools be provided with the tools and mandate to play a significant role in prevention and promotion.

References

- Bernstein, D. P., Ahluvalia, T., Pogge, D., & Handelsman, L. (1997). Validity of the Childhood Trauma Questionnaire in an adolescent psychiatric population. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 340–348.
- Botvin, G. J., & Griffin, K. W. (2002). Life skills training as a primary prevention approach for adolescent drug abuse and other problem behaviors. *International Journal of Emergency Mental Health*, 4(1), 41–48.
- Chaffin, M., & Schmidt, S. (2006). An evidence-based perspective on interventions to stop or prevent child abuse. In J. R. Lutzker (Ed.), *Preventing violence: Research and evidence-based intervention strategies* (pp. 49–68). Washington, DC, US: American Psychological Association.
- Cicchetti, D., & Valentino, K. (2006). An ecological-transactional perspective on child maltreatment: Failure of the average expectable environment and its influence on child development. In D. Cicchetti, & Cohen (Eds.), *Developmental psychopathology: Volume 3: Risk, disorder, and adaptation* (pp. 129–201). Hoboken, NJ: Wiley and Sons.
- Crooks, C. V., Scott, K. L., Wolfe, D. A., Chiodo, D., & Killip, S. (2007). Understanding the link between childhood maltreatment and violent delinquency: What do schools have to add? *Child Maltreatment*, 12, 269–280.
- Crooks, C. V., Wolfe, D. A., & Jaffe, P. G. (2007). School-based adolescent dating violence prevention: Enhancing effective practice with a gender strategic approach. In K. Kendall-Tackett, & S. Giacomoni (Eds.), *Intimate partner violence* (pp. 16.1–16.18). Kingston, NJ: Civic Research Institute.
- Cyr, C., Euser, E. M., Bakermans-Kranenburg, M. J., & Van Ijzendoorn, M. H. (2010). Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development and Psychopathology*, 22(1), 87–108.
- Dube, S. R., Miller, J. W., Brown, D. W., Giles, W. H., Felitti, V. J., Dong, M., & Anda, R. F. (2006). Adverse childhood experiences and the association with ever using alcohol and initiating alcohol use during adolescence. *Journal of Adolescent Health*, 38(4), e1–e10.
- Edwards, V. J., Dube, S. R., Felitti, V. J., & Anda, R. F. (2007). It's OK to ask about past abuse. *American Psychologist*, 62(4), 327–328.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine*, 14(4), 245–258.
- Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2007). Polyvictimization: A neglected component in child victimization. *Child Abuse & Neglect*, 31, 7–26.

- Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2009). Lifetime assessment of poly-victimization in a national sample of children and youth. *Child Abuse & Neglect*, 33(7), 403–411.
- Ford, J. D., Elhai, J. D., Connor, D. F., & Frueh, B. C. (2010). Poly-victimization and risk of posttraumatic, depressive, and substance use disorders and involvement in delinquency in a national sample of adolescents. *Journal of Adolescent Health*, 46, 545–552.
- Foshee, V. A., Bauman, K. E., Ennett, S. T., Linder, G. F., Benefield, T., & Suchindran, C. (2004). Assessing the long-term effects of the Safe Dates program and a booster in preventing and reducing adolescent dating violence victimization and perpetration. *American Journal of Public Health*, 94, 619–624.
- Foster, H., & Brooks-Gunn, J. (2009). Toward a stress process model of children's exposure to physical family and community violence. *Clinical Child and Family Psychology Review*, 12, 71–94.
- Garbarino, J. (1999). *Lost boys: Why our sons turn violent and how we can save them*. New York, US: Free Press.
- Hahm, H. C., Lee, Y., Ozonoff, A., & Wert, M. J. (2010). The impact of multiple types of child maltreatment on subsequent risk behaviors among women during the transition from adolescence to young adulthood. *Journal of Youth and Adolescence*, 39, 528–540.
- Hammond, W. R., Haegerich, T. M., & Saul, J. (2009). The public health approach to youth violence and child maltreatment prevention at the centers for disease control and prevention. *Psychological Services*, 6(4), 253–263.
- Hao, L., & Pong, S. (2008). The role of school in the upward mobility of disadvantaged immigrants' children. *Annals of the American Academy of Political and Social Science*, 620, 62–89.
- Hillis, S. D., Anda, R. F., Dube, S. R., Felitti, V. J., Marchbanks, P. A., & Marks, J. S. (2004). The association between adverse childhood experiences, adolescent pregnancy, longterm psychosocial consequences, and fetal death. *Pediatrics*, 113, 320–327.
- Human Resources Development Canada. (2001). *National Longitudinal Survey of Children and Youth: Cycle 4 2000–2001*. Ottawa, Canada: Author.
- Hussey, J. M., Chang, J. J., & Kotch, J. B. (2006). Child maltreatment in the United States: Prevalence, risk factors, and adolescent health consequences. *Pediatrics*, 118, 933–942.
- Johansson, P., & Kempf-Leonard, K. (2009). A gender-specific pathway to serious, violent, and chronic offending? Exploring Howell's risk factors for serious delinquency. *Crime & Delinquency, Special Issue: Gender Issues in Juvenile and Criminal Justice*, 55, 216–240.
- Karr-Morse, R., & Wiley, M. S. (1997). *Ghosts from the nursery: Tracing the roots of violence*. New York: Atlantic Monthly Press.
- Kellam, S. G., & Langevin, D. J. (2003). A framework for understanding "evidence" in prevention research and programs. *Prevention Science*, 4(3), 137–153.
- Kim, J., Cicchetti, D., Rogosch, F. A., & Manly, J. T. (2009). Child maltreatment and trajectories of personality and behavioral functioning: Implications for the development of personality disorder. *Development and Psychopathology*, 21(3), 889–912.
- Lansford, J. E., Dodge, K. A., Pettit, G. S., Bates, J. E., Crozier, J., & Kaplow, J. (2002). A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence. *Archives of Pediatrics and Adolescent Medicine*, 156, 824–830.
- Lansford, J. E., Miller-Johnson, S., Berlin, L. J., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2007). Early physical abuse and later violent delinquency: A prospective longitudinal study. *Child Maltreatment*, 12(3), 233–245.
- Maas, C., Herrenkohl, T. I., & Sousa, C. (2008). Review of research on child maltreatment and violence in youth. *Trauma, Violence, and Abuse*, 9, 56–67.
- Margolin, G., Vickerman, K. A., Ramos, M. C., Serrano, S. D., Gordis, E. B., Iturralde, E., Oliver, P. H., & Spies, L. A. (2009). Youth exposed to violence: Stability, co-occurrence, and context. *Clinical Child and Family Psychology Review*, 12(1), 39–54.
- Mayberry, M. L., Espelage, D. L., & Koenig, B. (2009). Multilevel modeling of direct effects and interactions of peers, parents, school and community influences on adolescent substance use. *Journal of Youth and Adolescence*, 38, 1038–1049.
- Nation, M., Crusto, C., Wandersman, A., Kumpfer, K. L., Seybolt, D., Morrissey-Kane, E., & Davino, K. (2003). What works in prevention: Principles of effective prevention programs. *American Psychologist*, 58, 449–456.
- Nooner, K. B., Litrownik, A. J., Thompson, R., Margolis, B., English, D. J., Knight, E. D., Everson, M. D., & Roesch, S. (2010). Youth self-report of physical and sexual abuse: A latent class analysis. *Child Abuse & Neglect*, 34, 146–154.
- Stewart, A., Livingston, M., & Dennison, S. (2008). Transitions and turning points: Examining the links between child maltreatment and juvenile offending. *Child Abuse & Neglect*, 32, 51–66.
- Teicher, M. H., Samson, J. A., Polcari, A., & McGreenery, C. E. (2006). Sticks, stones, and hurtful words: Relative effects of various forms of childhood maltreatment. *The American Journal of Psychiatry*, 163, 993–1000.
- Thames Valley District School Board Research and Assessment Services. (2005). *The committee to review the environment of safety in our schools: Report*. London, Ontario, Canada: Author.
- Wekerle, C., & Wolfe, D. A. (2003). Child maltreatment. In E. J. Mash, & R. A. Barkley (Eds.), *Child psychopathology* (2nd ed., pp. 632–684). New York: Guilford Press.
- Wolfe, D. A., Crooks, C. V., Chiodo, D., & Jaffe, P. (2009). Child maltreatment, bullying, gender-based harassment, and adolescent dating violence: Making the connections. *Psychology of Women Quarterly*, 33, 21–24.
- Wolfe, D. A., Jaffe, P., & Crooks, C. (2006). *Adolescent risk behaviors: Why teens experiment and strategies to keep them safe*. New Haven: Yale University Press.
- Wolfe, D. A., Wekerle, C., Scott, K., Straatman, A., Grasley, C., & Reitzel-Jaffe, D. (2003). Dating violence prevention with at-risk youth: A controlled outcome evaluation. *Journal of Consulting and Clinical Psychology*, 71, 279–291.