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Exploring gender differences in dating violence/harassment prevention programming in middle schools: results from a randomized experiment

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Abstract In this study, we randomly assigned 123 sixth and seventh grade classrooms from seven middle schools in the greater Cleveland area to one of two five-session curricula addressing gender violence/sexual harassment (GV/SH) or to a no-treatment control group. A baseline survey and two follow-up surveys were administered immediately after the treatment (Wave 2) and about six months post-treatment (Wave 3). In an earlier paper, we demonstrated the effectiveness of two approaches to youth GV/SH prevention programming (a fact-based, law and justice curriculum and an interaction-based curriculum). In this paper, we explored whether these largely positive findings remain for both girls and boys, including whether girls experience higher levels of GV/SH than boys. Most of our statistical models proved to be non-statistically significant. However, in 2 of our 48 victimization/perpetration (any violence, sexual violence and non-sexual violence) models (across two post-intervention follow-up points), we observed that the interventions reduced peer (male or female, non-dating partner) sexual violence victimization and reduced peer perpetration, but another outcome model indicated that the interventions increased dating perpetration. These mixed findings will need to be explored further in future research. Regarding our primary research question, we observed no

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statistically significant differences for the treatment multiplied by gender interaction terms for any of the perpetration or victimization outcome models, suggesting that the treatment had similar effects on girls and boys. However, we did observe that boys are more involved in violence than girls: both as victims and perpetrators. Boys experienced significantly more of three types of victimization from peers and dating partners compared to what girls experienced at the hands of their peers and dating partners. As perpetrators, boys committed more sexual victimization against peers (immediately post-intervention only) and more sexual victimization against dating partners than girls. The implications of these results are discussed.

Keywords Teen dating violence · Gender · Middle schools · Prevention curricula · Randomized experiment

Introduction

Teen dating[1] violence is no longer a problem only recognized by sexual assault and domestic violence centers, as it was nearly 30 years ago. Now it is acknowledged as a major problem; its frequency is surveyed, suggesting that it is experienced by as many as 40–60% of teenagers (Foshee et al. 1996; Hickman et al. 2004; Jouriles et al. 2009); and interventions have been created to reduce its severity or prevent its inception by a coalition of stakeholders, including policy makers, criminologists, educators, psychologists, and medical personnel (Mulford and Giordano 2008). School-based programs to prevent and reduce the precursors to teen dating violence have become one of the most popular modes of intervention to disrupt the normalcy of teen dating violence.

In our research project funded by the National Institute of Justice (NIJ) in seven middle schools in the greater Cleveland area, students in 123 sixth and seventh grade classrooms were randomly assigned to one of two five-session curricula addressing gender violence/sexual harassment (GV/SH) or to a no-treatment control. Three-student surveys were administered over a six-month period. In an earlier paper (Taylor et al. 2010), students in one of the treatments (law and justice), compared to the control group, had significantly improved outcomes in awareness of their abusive behaviors, attitudes toward GV/SH and personal space, and knowledge. Students in the second treatment (Interaction-focused) experienced lower rates of victimization, increased awareness of abusive behaviors, and improved attitudes towards personal space. Neither curricula affected perpetration or victimization of sexual harassment. While the interventions appeared to reduce peer violence victimization and perpetration, a conflicting finding emerged: the intervention may have increased dating violence perpetration (or at least the reporting of it) but not dating violence victimization. In this article, we will explore whether these effects of our interventions vary for boys compared to girls.

[1] We defined "dating" in the following manner: "girls or boys you are going with, dating, going steady with, or have gone out with, dated, or gone steady with for at least one week. This group includes anyone who is or was your boyfriend/girlfriend for at least one week."

Research questions

Our primary research question relates to whether there is a difference in the effects of the interventions by gender. That is, do the interventions help girls more than boys or vice versa? This is an important question to address for there is a considerable amount of evidence that girls have different rates of victimization and perpetration than boys and experience violence differently (see "Literature review"). Given these findings, it is critical for researchers to assess if universal primary prevention interventions (like the interventions we tested) are able to help both girls and boys. If there are differential effects, future research can assess whether changes are needed in the interventions. This leads to our second question about whether there are differences in the levels of violence experienced by girls compared to boys (as victims or perpetrators). Our third question is whether our earlier reported findings regarding the effects of our two treatment groups (Taylor et al. 2010) remain the same when controlling for possible gender effects. Our paper is one of the few to examine gender difference in terms of the effects of prevention programming. We focus on the issue of gender because it has often not received due attention in attempts to address dating violence and is a central feature of dating violence (Lesko 2000; Stein 1995).[2]

Literature review

Prevalence of teen gender violence and sexual harassment (GV/SH)

GV/SH among teenagers has serious health consequences, including significantly poorer mental and physical health, and more trauma symptoms (Howard et al. 2007a, 2007b; Molidor and Tolman 1998). Prevalence rates vary, but research on teen dating violence suggests that as many as 40–60% of teenagers experience dating violence, including sexual, physical, and psychological abuse (Foshee et al. 1996; Hickman et al. 2004; Jouriles et al. 2009).

The most consistent, standardized source for examining differences in rates of sexual and physical teen dating violence for girls compared to boys can be found in the Youth Risk Behavior Survey (YRBS), a comprehensive nationally representative survey about youth behaviors administered by the Centers for Disease Control and Prevention in conjunction with state departments of public health. Unfortunately, the administration of this survey is limited to students in grades 9–12, with some states or locales recently gathering data from eighth graders. Nonetheless, the national results from 2007 YRBS showed that for the

[2] While there are other potential demographic variables to examine (e.g., ethnicity), we focus on the topic of gender differences. Gender and the greater physical strength of males over females is a key aspect of dating violence (Stein 1995) and can be used by boys to control young girls. We believe the topic of gender is too complex to present with other demographic variables and would interfere with our goal of a parsimonious presentation. Given our use of a RCT design, we found that we have a balance across our treatment/control groups on the issue of ethnicity and other demographic variables. Given this balance, we are able to assess the independent effects of gender without simultaneously examining other demographic variables.

question "hit, slapped or physically hurt on purpose by their boyfriend or girlfriend during the last 12 months" the frequency was 8.8% for girls and 11.0% for boys (victimization), and for the second of the two questions on TDV, "ever physically forced to have sexual intercourse in the past 12 months," frequency was 11.3% of the girls, and 4.5% of the boys (however, this question does not acknowledge the relationship or age of the perpetrator) (see www.cdc.gov/HealthyYouth/yrbs/pdf/yrbs07_us_disparity_sex.pdf). Results from Ohio (the state of our research project) for the same questions in 2007 (whether your boyfriend or girlfriend hit, slapped or physically hurt you on purpose during the past 12 months) revealed a rate of 9.8% for males, and 9.7% for females; and for the question, "Have you ever been physically forced to have sexual intercourse when you did not want to" was 7.2% for the males and 13.0% for the females (see www.odh.ohio.gov/odhPrograms/chss/ad_hlth/YouthRsk/youthrsk1.aspx).

One dimension of teen dating violence that is not captured by the YRBS is the factor of fear of being hit by one's partner, and the injury that might occur. Girls are more likely than boys to report more fear related to GV/SH (Foshee 1996; O'Keefe and Treister 1998; Molidor et al. 2000). By the same token, girls are more likely to be injured by their male dating partner than boys are likely to be injured by their female dating partner (Bennett and Fineran 1998; Sugarman and Hotaling 1989; Wolfe et al. 2009).

It is also useful to look at data about peer sexual harassment which is more ubiquitous and widespread than dating violence. Victims of sexual harassment, in addition to suffering from poorer mental and physical health, also exhibit greater school avoidance than those not sexually harassed (Fineran and Gruber 2004; Gruber and Fineran 2008; Larkin 1994). In comparison with boys who reported harassment, studies have found that girls fare consistently worse on such measures (Fineran and Gruber 2004; Gruber and Fineran 2008; AAUW 1993, 2001). Data from the most recent national study of 2,064 students in grades 8–11 indicate that 83% of females experience sexual harassment from their male peers while male students also reveal high levels of sexual harassment in school (60–79%) (AAUW 2001). Interestingly, the male students charge their male counterparts with perpetrating the majority of verbal harassment (AAUW 1993, 2001; Tolman et al. 2003). Findings from the females suggest that the onset of their sexual harassment began in grade 6. Prevalence rates for sexual harassment suggest that it increases throughout middle school, indicating a need for early intervention (McMaster et al. 2002; Pellegrini 2001).

While girls and boys both experience high rates of GV/SH, they experience, think of, and react to GV/SH differently (O'Keefe and Treister 1998; Gruber and Fineran 2008). First, girls are more likely than boys to be sexually victimized (Foshee 1996; Molidor et al. 2000; Wolitzky-Taylor et al. 2008), and sustain more relationship violence-related injuries than their male counterparts (Howard et al. 2007a, 2007b; Jackson et al. 2000; Makepeace 1987; Molidor and Tolman 1998; O'Keefe 1997). These studies have also revealed that, while males and females both perpetrate GV/SH at high levels, the motivations (O'Keefe 1997; Mulford and Giordano 2008), attitudes (Jackson et al. 2000; LeJeune and Follette 1994) and consequences (Molidor and Tolman 1998; Wolitzky-Taylor et al. 2008) are often very different, with girls faring consistently worse on a number of physical (Foshee 1996; Malik

et al. 1997; O'Keefe 1997; Watson et al. 2001; Fineran and Gruber 2004; Gruber and Fineran 2008; AAUW 1993, 2001) and emotional outcomes (Foshee 1996; O'Keefe and Treister 1998; Molidor et al. 2000). Teenage girls are more often killed by male dating partners (or ex-partners) than the reverse (Sousa 1999); data from the American Bar Association between 1993 and 1999 found that 22% of all homicides against females aged 16–19 were committed by an intimate partner (Blow 2009). Moreover, sexual risk behaviors, pregnancy, and suicidality are also associated with victimization in girls (Silverman et al. 2001; 2004).

Research on teen GV/SH prevention programs

Prevention efforts in most school districts focus on violence in general terms (e.g., gangs, delinquency, drugs) but largely neglect the gendered nature of school violence (Stein 1995). Studies on teen GV/SH have focused on students in the eighth grade and higher (Foshee et al. 1996, 1998, 2000, 2001, 2005, 2007, 2008; Jaycox et al. 2006[3]). While there have been numerous studies on risk factors for GV/SH perpetration over the past 20 years (see Mulford and Giordano 2008), GV/SH data on sixth and seventh grades are sparse, with few teen GV/SH interventions having been evaluated rigorously (CDC 1998; Chalk and King 1998; Cornelius and Resseguie 2006; Hickman et al. 2004; Meyer and Stein 2004; Taylor et al. 2010; Whitaker et al. 2006). Of these, most document at least a short-term positive change in knowledge and/or attitudes related to gender violence (Foshee et al. 1996, 1998; 2000; Avery-Leaf et al. 1997; Lavoie et al. 1995; Macgowan 1997; Jaffe et al. 1992; Wolfe et al. 2009), while others show longer-term positive program effects (Foshee et al. 2004a, b, 2005; Foshee and Reyes 2009).

In one of the more rigorously evaluated interventions, Wolfe et al.(2009) experimentally examined the 4R: Skills for Youth Relationships program with Canadian ninth graders. They found that after 21 sessions the program was able to reduce physical dating violence in the intervention group as compared to the control group. Safe Dates, a U.S.-based program for eighth and ninth graders designed and evaluated by Foshee et al. (1996, 1998, 2000, 2005), has also experimentally shown a reduction in long-term physical dating violence after only 10 sessions. Evidence of GV/SH in the eighth grade suggests that students in younger grades, specifically sixth and seventh grades, are important points of primary prevention before dating patterns have been set (Lonsway 1996; Mulford and Giordano 2008).

In Foshee & Matthew's (2007) review of GV/SH program evaluations, gender differences from some high quality experimental studies were summarized. In one of those studies, black male junior high students with high academic abilities showed the greatest and most significant gains (Macgowan 1997; Kraizer and Larson 1993). In the evaluation of Safe Dates, the researchers (Foshee and Langwick 2004) found that the program was equally effective in prevention perpetration for males and females and for white and minority adolescents (Foshee and Matthew 2007). Wolfe's cluster randomized trial of 21 sessions conducted in health classes for ninth graders in 20 Canadian schools (1,722 students aged 14–15) on the topics of healthy

[3] The Jaycox et al. (2006) study is very different than our study in that it involved high school students, included three intervention sessions and was taught by lawyers.

relationships, sexual health and substance use showed promising results, especially for boys (Wolfe et al. 2009). Physical dating violence (PDV) was lower in the intervention compared to the control group (9.8% vs 7.4%; adjusted odds ratio, 2.42; $p = .05$), and a significant group-to-sex interaction effect indicated that the intervention effect was greater in boys (PDV: 7.1% in controls vs 2.7% in intervention students) than in girls (12.1% vs 11.9%). However, the likelihood of replication in the US might be minimal given the pressures of high stakes testing that permeates U.S. schools and the corresponding constraints for implementing a 21-session curriculum.

In an effort to curb the vast prevalence of GV/SH, as documented in the previous section, we evaluated two substantively distinct curricula on GV/SH prevention. In a prior analysis (Taylor et al. 2008, 2010), we found largely positive findings regarding the effectiveness of our interventions in reducing GV/SH compared to a control group. In this paper, we explore whether these largely positive findings remain for both girls and boys or works better for one over the other, as suggested by Wolfe et al. (2009). We had originally thought that girls would have experienced more sexual violence and therefore would be more receptive to our interventions. Moreover, we wondered if there were differences in the levels of violence perpetrated or experienced by girls or by boys. In the sections that follow, we describe our interventions and methods used in our study, followed by a review of our data analytic results on gender differences and its possible interaction effects with our interventions.

Description of the interventions

The two curricula were (1) an interaction-based curriculum and (2) a law and justice curriculum. Also, a third set of classes served as the control condition that did not receive either of the two curricula designed by our team. Instead, the control condition received the standard health education offered by their respective school districts, which did not include dating violence prevention material.

We developed the two treatments in close collaboration with the staff members from the three participating school districts and a local rape crisis center. Both curricula contained five lessons (designed to last 40 minutes each) and were taught over about five consecutive weeks. The lessons were taught by an experienced female educator from a local sexual assault center. This educator was the center's manager of education services, and had extensive experience teaching violence prevention in schools. Since the lessons were written for middle school students, the classroom pedagogy had to engage them and not rely on simply didactic lessons. Although a longer program could have been developed, the project team decided to develop lessons that could be implemented within the typical time constraints that most schools faced.

Our lessons concentrated on the definitions and applications of "personal space" and "boundaries"—notions that are synonymous with laws—distinguishing permissible behaviors from those that are not. From the obvious wall that serves as a boundary of a room, to a border that delineates one state or nation from another, to a more abstract use of boundaries employed in rule- and law-making, students have

various opportunities to apply these concepts in activities themed around precursors to GV/SH. Both curricula began with the same lesson on the establishment of relationship boundaries through an activity that measures "personal space." The distinctions between the two treatments (interaction-based, law and justice) were reflected in the questions that followed the activity during the first lesson. The law and justice curriculum prompted discussion about the consequences of not obeying boundaries (e.g., rules, laws). The interaction-based treatment centered on the ways in which one notices that boundaries have been crossed or violated, either in terms of transmitting oneself or understanding the ways in which someone else might indicate his or her boundaries had been crossed.

More broadly, the interaction-based curriculum addressed GV/SH by focusing on setting and communicating boundaries in relationships; the formation of deliberate relationships/friendships and the continuum between friendship and intimacy; the determination of wanted/unwanted behaviors; and the role of the bystander as intervener in GV/SH incidents. The law and justice curriculum focused on laws, definitions, information, and data about penalties for sexual assault and sexual harassment as well as imparting results from research about the consequences for perpetrators of GV/SH. The law and justice intervention explored the concepts of laws/boundaries, plotting the shifting nature of personal space, considering laws as they apply by gender, and a final activity on myths and facts about sexual harassment.

Very detailed instructions were included with each lesson. These instructions covered items such as ground rules (e.g., "no swear words") as well as the length of time to devote to each activity within the class period. We carefully monitored the curricula implementation. As pointed out by Durlak and Dupre (2008), an assessment of implementation of an intervention is a critical aspect of a program evaluation. Based on the student surveys, observations by our team, and tracking logs maintained by the interventionist, the curricula were implemented as designed and planned.[4]

The rationale for selecting these two curricula to test was based on the Theory of Reasoned Action (TRA). TRA is based on research that demonstrates that intentions to behave are immediate predecessors to specific actions, and proposes that attitudes toward and perceived norms about the desired behavior facilitate the intention to change, modify, or adopt a particular behavior (Ajzen and Fishbein 1980; Fishbein 1967). Our interaction-based curriculum was designed to address negative attitudes and beliefs about dating violence, through interaction skill building, that in turn will lead to behavioral change. However, the law and justice curriculum was designed to change behavior more directly through a fact-based curriculum on the laws pertaining to dating violence. Knowledge of these laws and penalties was then expected to reduce violent behavior toward dating partners. Our use of TRA was based on the explanatory power of this theory, as demonstrated in a variety of fields for the past 30 years (Fores et al. 2002; O'Callaghan et al. 1997; McGahee et al. 2000; Budd et al. 1983; Conner et al. 1998; de Vroome et al. 2000).

[4] A detailed description of the interventions and the roles of our project team members and project partners are provided in the project final report (see Taylor et al. 2008).

Research methods

Study design

This experiment was conducted in 2006 and 2007 with students in sixth and seventh grade classrooms from three suburban school districts in the Cleveland, Ohio area, including: 80 science classes, 17 social studies classes, 12 health classes and 14 other classes. The 123 classrooms were drawn from three participating school districts from Shaker Heights City School District, Berea City School District, and Cleveland Heights-University Heights School District. All sixth and seventh grade classrooms from these three school districts were selected and participated in the random assignment process, and student survey process). We selected these school districts because they had large numbers of sixth and seventh grade classes ($n>100$) available for random assignment and the student body ($n > 15{,}000$) represented a diversity of ethnic groups to study the interventions. In total, seven schools from across these districts were included in the study ($n=1{,}639$ students across 123 study classrooms).

With such a sample size, our study had a good degree of statistical power to find small to medium effect sizes. According to Cohen (1988), effect sizes can be classified in the following manner: Small effects =.25; medium effects =.75; large effects=1.25. Using Optimal Design developed by Raudenbush and Liu (2000), it was possible to calculate the statistical power of this HLM-based study (assuming an alpha of .05, a two-sided test, and an intraclass correlation coefficient of .15). This study had enough power to detect large, medium and small effect sizes, although the power did not quite reach the .80 threshold for very small effect sizes (power just below .7).[5]

While we had 1,639 students in the study, not all the participants completed all of the questions on the study surveys across all the waves of the survey. Nevertheless, we were able to achieve a fairly high participation rate. At Wave 1, 1,507 of 1,639 study eligible participants completed the survey (92%), at Wave 2, we retained an 89% participation rate (1,460 of the original 1,639), and at Wave 3, we retained an 83% participation rate (1,356 of the original 1,639). As displayed in Table 1, our attrition of students was relatively balanced across the treatment and control groups. As reported in an earlier paper (Taylor et al. 2010), we found no differences in the survey participation rates across the Control, Interaction Treatment Group and Law and Justice Treatment Group for the three survey waves.

We used a randomized control trial (RCT) design. RCTs are typically considered the best method for eliminating threats to internal validity in evaluating social policies and programs (Berk et al. 1985; Boruch et al. 1978; Campbell 1969; Campbell and Stanley 1963; Dennis and Boruch 1989). RCTs provide a strong counterfactual description of what would have happened to the treatment group if they had not been exposed to the treatment (Rubin 1974; Holland 1986). Random

[5] Due to resource constraints, our main interest was in detecting small to medium effect sizes, for anything below that level (given the time and resources to implement the program) might possibly be considered less meaningful for policy making purposes.

Table 1 Student, classroom and school attrition across the three waves

	Wave 1 (preceding the intervention)			Wave 2 (period during the intervention)			Wave 2 (period during the intervention)		
	Interaction treatment	Law and justice treatment	Control group	Interaction treatment	Law and justice treatment	Control group	Interaction treatment	Law and justice treatment	Control group
No. of schools	7	7	7	7	7	7	7	7	7
No. of classrooms	29	29	65	29	29	65	29	29	65
No. of students	392	414	701	374	404	682	345	374	637

assignment was implemented at the classroom level,[6] and we worked carefully to maintain the integrity of the assignment process (e.g., avoiding contamination). We established procedures to monitor and maintain the integrity of the classroom assignment process (and monitor for expectancy, novelty, disruption, and local history events).

We used a stratified random allocation procedure (see Boruch 1997). Classes were classified by two relevant stratifying criteria (grade level and school).[7] Also, given that our main question was whether treatment was more effective than no treatment, we randomly assigned about half of our classes (54%) to the control condition and the other half to receive an intervention (either the interaction-based or law and justice-based curriculum). Twenty-three percent of the classrooms (n=29) were assigned to treatment 1 (an interaction-based curriculum) conducted over a five-week period. Twenty-three percent of the classrooms (n=29) were assigned to treatment 2 (a law and justice-based curriculum) also conducted over a five-week period. Fifty-four percent of the classrooms (n=65) were assigned to the control condition.

All classes assigned to treatment received their appropriate treatment, and the same held true for the control group (i.e., our study had no "overrides" or cases that did not follow the random assignment protocol). Also, as reported in Taylor et al. (2008), our RCT design produced largely equivalent treatment and control groups prior to the delivery of the intervention. That is, we found no pre-treatment differences between the Control, Interaction Treatment Group, and Law and Justice Treatment Group for a whole series of baseline variables [demographics (including gender), history of victimization or perpetration, experience with prevention programs, and history of dating] (Taylor et al. 2008).

[6] Logistically, it would not have been possible to take students out of their regular schedule and randomly assign them on an individual basis to new classes. Also, the funding necessary to assign a large number of schools (e.g., over 50 schools) randomly to our study conditions was not available.

[7] Although not strictly necessary, pre-stratification helps ensure that groups start out with some identical characteristics and assure that we have adequate numbers of classrooms in each of the cells for each participating school (see Boruch 1997).

Measures

Student surveys were completed using paper and pencil, and were distributed by a member of the research team: (1) immediately before the assignment to one of the three study conditions, (2) immediately following after the treatment or control condition were completed, and (3) five to six months[8] after their assignment to one of the three study conditions. To participate in the survey, we required the active written consent of the parents' of the students, along with the verbal assent of the students. There were no apparent differences in the survey participation rates across the three comparison groups for the three survey waves. That is, all the groups participated (both parents consented and child assented to completing a survey) at a rate of about 75% for the baseline survey and 70% for the first and second follow-up surveys. Below is a brief description of our survey measures. In Taylor et al. (2008), we include a copy of the survey, and present a more detailed review of these measures, along with reliability scores.

Sexual and non-sexual (physical) violence victimization and perpetration

The survey included prevalence (yes/no) and incidence (number of times) questions on the experience of being a victim and/or perpetrator of sexual violence and non-sexual (physical) violence by/of peers,[9] and people that you have dated.[10] While the intervention was focused on reducing violence among dating partners, we examine this issue to assess if the intervention's effect might extend to peers, as well as dating partners. The items for this survey were adapted from CDC's Youth Risk Behavior Survey and from a study by Foshee et al. (1998). Physical violence items included: slapping or scratching; physically twisting an arm or bending back fingers; pushing, grabbing, shoving, or kicking somewhere on the body other than in the private parts; hitting with a fist or with something hard besides a fist; and threatening with a knife or gun. Sexual violence items included: pushing, grabbing, shoving, or kicking in the private parts; and making you touch their private parts or touching yours when you did not want them to. All of the victimization measures have Cronbach's alpha scores above .71, except for the frequency measure of dating victimization in Wave 2 which had a score of .60. All the violent perpetration measures have Cronbach's alpha scores above .70.

Analysis plan

In order to address any missing data from partially completed questionnaires, we used multiple imputations in our analyses (Fichman and Cummings 2003). First, we

[8] School scheduling precluded us from doing all of the surveys at the six-month follow-up point in time.

[9] This was defined for students as, "People about the same age as you. They may be your classmates, kids in your school, neighborhood/community, and are both girls and boys the same age as you. You might or might not know them or think of them as your friends."

[10] This was defined for students as, "People who you are 'going with', 'dating,' 'going steady with' or have 'gone out with,' 'dated,' or 'gone steady with' for at least a week. This group also includes anyone who is or was your boyfriend/girlfriend for at least a week."

created five multiply imputed datasets in SAS 9.1 using the PROC MI procedure. Secondly, we analyzed our datasets in HLM 6.0, which supports multiple imputations. To address all of our quantitative study aims we used HLM 6 software developed by Raudenbush et al. (2004). HLM provides a conceptual framework and a flexible set of analytic tools to analyze the special requirements of our data (i.e., students are nested within classes that are nested within schools). We estimated numerous HLM models examining the effects of GV/SH classes on our outcomes immediately after the GV/SH classes and at a six-month follow up. We examined a number of HLM models for the experience of being a victim and/or perpetrator of sexual violence and non-sexual (physical) violence from/to "peers" and "people that you have dated."

Results

The first part of this section presents the background characteristics of our sample, including descriptive statistics on the distribution of our outcome measures. The subsequent section presents the substantive results of our multivariate HLMs for each of our outcome measures.

Descriptive statistics

The students in our study were from the sixth and seventh grades and were generally between the ages of 11 to 13 years old. Our study is unique in our use of such a young group to study GV/SH. That is, most GV/SH studies are done with students in the ninth grade through twelfth grades of high school. Next, we had slightly more girls (52%, n=831) in our sample than boys (48%, n=761).[11] Approximately a quarter of our student sample were African American (27% or n=392), about half were Caucasian (52% or n=750), 3% were Asian (n=43), 3% were Hispanic (n=40), 2% Native American (n=32), and 13% multi-racial or other ethnicities (n=187). About a quarter of our sample (23% or n=288) also had prior experience with a violence prevention educational program. The majority of our sample (56% or n=705) had been in a dating relationship at least once in their lifetime (where the dating lasted longer than at least one week); about half of these students had either one or two dating partners (75% had five or fewer dating partners). Our sample consisted of a relatively large number of students who had already experienced dating violence in their lifetime prior to our study (28% or n=445). Also, 21% (n=334) of our sample reported in the baseline survey perpetrating at least one act of dating violence in their lifetime.

To provide an overview of the distribution of our outcome measures, we present descriptive statistics for each of our main outcome measures for boys and girls in Table 2 for our baseline (Wave 1), time 2 point immediately after the

[11] As discussed earlier, not all the respondents completed all of the questions on the survey. For example, 47 students did not answer the gender question on the survey.

Table 2 Descriptive statistics for main outcome measures by gender

Questions	Wave 1		Wave 2		Wave 3	
	Males	Females	Males	Females	Males	Females
Q1. Have your peers…						
Prevalence of any violence	1.63 (1.57)	1.06 (1.33)	1.26 (1.53)	.95 (1.33)	1.70 (1.71)	1.27 (1.47)
Frequency of any violence	2.37 (2.77)	1.41 (2.12)	1.83 (2.74)	1.24 (2.07)	2.75 (3.67)	1.78 (2.54)
Prevalence of sexual violence	.18 (.39)	.10 (.34)	.15 (.39)	.09 (.33)	.24 (.51)	.15 (.41)
Frequency of sexual violence	.24 (.58)	.14 (.54)	.20 (.62)	.12 (.51)	.41 (1.05)	.21 (.68)
Prevalence of Non-sexual violence	1.45 (1.38)	.96 (1.17)	1.11 (1.31)	.86 (1.19)	1.46 (1.40)	1.12 (1.28)
Frequency of Non-sexual violence	2.12 (2.44)	1.28 (1.85)	1.64 (2.34)	1.12 (1.84)	2.35 (2.93)	1.57 (2.18)
Q3. Has someone you have dated …						
Prevalence of any violence	.28 (.73)	.19 (.65)	.27 (.84)	.17 (.57)	.35 (1.05)	.21 (.67)
Frequency of any violence	.38 (1.16)	.23 (.88)	.35 (1.16)	.22 (.80)	.61 (2.31)	.29 (1.03)
Prevalence of sexual violence	.07 (.28)	.05 (.25)	.05 (.24)	.04 (.20)	.08 (.33)	.07 (.28)
Frequency of sexual violence	.10 (.45)	.07 (.36)	.06 (.31)	.06 (.31)	.17 (.73)	.10 (.50)
Prevalence of Non-sexual violence	.21 (.58)	.13 (.51)	.22 (.69)	.13 (.46)	.27 (.80)	.14 (.52)
Frequency of Non-sexual violence	.28 (.93)	.16 (.69)	.29 (1.00)	.16 (.64)	.44 (1.69)	.18 (.77)
Q4. Thinking about peers, have you…						
Prevalence of any violence	1.03 (1.29)	.70 (1.14)	.76 (1.24)	.59 (1.02)	1.00 (1.39)	.76 (1.13)
Frequency of any violence	1.48 (2.28)	.91 (1.67)	1.17 (2.28)	.77 (1.62)	1.57 (2.81)	1.05 (1.88)
Prevalence of sexual violence	.07 (.25)	.05 (.22)	.05 (.23)	.05 (.22)	.09 (.33)	.05 (.24)
Frequency of sexual violence	.10 (.44)	.06 (.31)	.07 (.37)	.06 (.36)	.15 (.66)	.08 (.38)
Prevalence of Non-sexual violence	.96 (1.19)	.65 (1.04)	.71 (1.13)	.54 (.93)	.91 (.123)	.71 (1.03)
Frequency of Non-sexual violence	1.38 (2.08)	.85 (1.53)	1.10 (2.09)	.71 (1.48)	1.41 (2.39)	.98 (1.72)
Q6. Thinking about people you have dated, have you…						
Prevalence of any violence	.10 (.35)	.21 (.71)	.10 (.49)	.16 (.51)	.15 (.69)	.19 (.65)
Frequency of any violence	.12 (.50)	.27 (.98)	.14 (.71)	.19 (.67)	.27 (1.55)	.26 (.96)
Prevalence of sexual violence	.02 (.14)	.04 (.20)	.03 (.18)	.02 (.13)	.05 (.25)	.04 (.22)
Frequency of sexual violence	.02 (.21)	.04 (.28)	.05 (.32)	.02 (.21)	.11 (.57)	.05 (.33)
Prevalence of Non-sexual violence	.08 (.31)	.18 (.58)	.07 (.41)	.14 (.47)	.09 (.52)	.16 (.53)
Frequency of Non-sexual violence	.10 (.44)	.22 (.81)	.08 (.58)	.17 (.62)	.16 (1.11)	.21 (.79)

intervention (Wave 2) and time 3 (Wave 3) five to six months post-intervention measures (see below). As a reference point for the reader, we present the baseline data, but our focus is on changes that occurred after the intervention. For each main outcome of "any" violence (inclusive of sexual and physical violence), sexual

violence, and non-sexual (physical) violence we calculated prevalence and frequency scores. Prevalence was calculated by looking at the survey items in each domain and scoring student responses as "yes" and "no" and then summing these responses into a count of the number of times a student responded yes to each domain.[12] For example, a value of 1.26 for peer victimization (the upper left-hand corner value) means that, on average, male students face 1.26 out of 7 types of victimization in Wave 2 [for the same measure girls experienced just under 1 (.95) out of 7 types of victimization]. Also, on average, male students face .15 sexual victimizations from their peers out of 2 types of sexual victimization. On average, students face 1.1 non-sexual victimizations from their peers out of the 5 types of non-sexual victimization. Frequency was calculated by looking at the survey items in each domain and scoring student responses as the number of times they were victimized/ perpetrated violence, which means that the frequencies must always be higher than the prevalence measures.[13] For example, a score of 1.83 (second row, upper left-hand column) means that on average male students were victimized more than 3 times (1=1–3 victimizations) in Wave 2 (the period during the intervention).

Overall, peer victimization is generally reported at the highest level by students followed by peer perpetration, dating victimization and dating perpetration. Based on Table 2, it can be seen that boys are experiencing higher level of victimization than girls for all categories across Waves 1, 2 and 3. also, boys are perpetrating more violence than girls in most of the categories from Table 2 (except for Wave 1 under dating perpetration and some of the categories under dating perpetration for Waves 2 and 3). Our tests of whether these differences are statistically significant are conducted in the context of our HLM models (see next section) which are well suited to address the nested nature of our data.

Hierarchical linear modeling (HLM)

The student, classroom and school-level variables used in the analyses were selected from the student surveys and included a level 1 classroom variable of a baseline score for each respective outcome variable selected (e.g., when sexual violence at time 2 follow-up is the outcome variable than we included a baseline measure of sexual violence). Our level 2 student variables included: a variable noting the treatment assignment (i.e., treatment 1, treatment 2 and control group), a gender variable (0=male and 1=female), a gender × treatment interaction term, and a site

[12] Prevalence of "any" violence was the sum of all student responses for one domain, with a possible score of 7 for survey items a through g. Prevalence of sexual violence was the sum of all student responses for sexual violence, with a possible score of 2 for items d and f. Prevalence of non-sexual (physical) violence was the sum of all student responses for one domain, with a possible score of 5 for items a, b, c, e, and g. Each outcome measure represents a sum of the different types of violence individuals face/perpetrate.

[13] If a student scored "0", they had 0 victimizations; 1=1-– victimizations; 2=4-– victimizations; 3=10+ victimizations. Each frequency measure represents a sum of the number of times students face violence on those measures.

variable (coded as 1 to 7 for each school building).[14] For each covariate introduced at the classroom level, it is centered at the grand mean for that variable.[15]

We ran 48 HLM models and used an alpha level of .05 (with a two-tailed test). Table 3 (see Appendix 1) presents our HLM models, including covariates for gender,[16] treatment assignment[17] and gender × treatment. The tables include estimated beta coefficients, standard errors for each fitted model (the numbers in parentheses), and asterisks for p values that convey the level of statistical significance of the beta coefficients (*< .05, **< .01).

Victimization outcomes

We explored personal victimizations perpetrated by the respondent's (1) peers and (2) individuals the respondent have dated. For each of these types of personal victimizations, we explored an overall victimization measure, sexual victimization, and non-sexual victimization. Within each of these three victimization measures, we explored prevalence post-intervention, and incidence/frequency post-intervention. Our victimization variable represents a sum of the seven types of victimization asked in our survey; therefore, a positive score is indicative of a greater level of victimization, while a negative number would indicate decreased levels.

Wave 2

During the intervention period (Wave 2 within the interaction-based treatment model), we found that girls experienced less sexual victimization from peers than boys experienced from peers [$\beta = -.044$ (.021), $p = .038$], less "any" victimization from dates than boys experienced from dates [$\beta = -.078$ (.039), $p = .046$], and less non-sexual victimization prevalence [$\beta = -.073$ (.033), $p = .026$] from dates than boys experienced from dates and less non-sexual victimization frequency [$\beta = -.109$ (.054), $p < .05$] from dates than boys experienced from dates. Over the same period, no statistically significant differences were observed for any of the treatment to control comparisons, nor were significant differences observed for the treatment multiplied by gender interaction terms for the victimization variables.

Wave 3

Six months after the intervention (Wave 3), we found that girls experienced fewer incidents of "any" victimization from peers than boys [law and justice model $\beta = -.439$

[14] Site 1=Ford MS (Berea), Site 2=Roehm MS (Berea), Site 3=Monticello MS (CHUH), Site 4=this planned site did not participate in the experiment and was dropped from the analysis, Site 5=Wiley MS (CHUH), Site 6=Shaker Heights MS (Shaker Heights), and Site 7=Woodbury School (Shaker Heights) which served as the reference category.

[15] That is, for each school, the intercept of the level 1 model is adjusted for the linear regression of the test scores on that variable. In a sense, that puts all school means on an equal footing with respect to that variable. In the HLM setting, the adjusted intercepts can be described as "adjusted school means." The variation among adjusted means will usually be less than the variation among the unadjusted means (see Raudenbush and Bryk, chapter 5 [2002]).

[16] Coded as female=1 and male=0.

[17] Coded as treatment=1 and control condition=0.

(.193), p = .023], less sexual victimization prevalence from peers than boys [law and justice model β=−.067 (.032), p = .037], fewer incidents (frequency measure) of sexual victimization from peers than boys [interaction-based treatment model β=−.128 (.054), p = .017; law and justice model β=−.172 (.059), p = .004], fewer incidents of non-sexual victimization from peers than boys (law and justice model β=−.321 (.159), p = .044], less "any" victimization prevalence from dates than boys [interaction-based treatment model β=−.131 (.053), p = .013; law and justice model β=−.106 (.052), p = .040], fewer incidents of "any" victimization from dates than boys [interaction-based treatment model β=−.260 (.104), p = .013; law and justice model β=−.301 (.110), p = .007], fewer incidents of sexual victimization from dates than boys [law and justice model β=−.074 (.037), p = .046], less non-sexual victimization prevalence from dates than boys [interaction-based treatment model β=−.119 (.040), p = .003; law and justice model β=−.096 (.040), p = .018], and fewer incidents of non-sexual victimization from dates than boys [law and justice model β=−.241 (.082), p = .004].

Over the same period, significant differences were observed for the interaction-based treatment compared to the control group for the prevalence [β=−.071 (.035), p = .048] and frequency [β=−.144 (.065), p = .030] of peer sexual violence victimization (indicating less sexual violence victimization for those in the interaction-based treatment compared to the control group). However, no significant differences were observed for the treatment multiplied by gender interaction terms for the victimization variables.

Perpetrating violence outcomes.

We also explored violence perpetrated by respondents against their (1) peers and (2) people the respondent dated, including an overall violence perpetration measure, a sexual violence perpetration measure, and a non-sexual (physical) violence non-sexual (physical) violence perpetration measure.

Wave 2

Over this period, while no statistically significant variables were observed for the peer perpetration dependent variable, a number of significant variables emerged for the dating perpetration dependent variable. During the intervention period (Wave 2 within the interaction-based treatment model), we found that girls perpetrated less sexual dating victimization (prevalence) than boys [β=−.022 (.009), p = .015], and girls perpetrated fewer incidents of sexual dating victimization than boys (frequency) [β=−.037 (.016), p = .022].

Over the same period, statistically significant differences were observed for the interaction-based treatment [β = .071 (.030), p = .020] compared to the control group, and the law and justice treatment [β = .064 (.032), p = .048] compared to the control group for the prevalence of "any" violence against dating partners (suggesting that the interventions increased the perpetration of dating violence). Also of concern is that interaction-based treatment was associated with higher levels of the prevalence of perpetrating dating sexual violence [β = .20 (.010), p = .039]. Of note, no significant differences were observed for the treatment multiplied by gender interaction terms for the perpetration variables (indicating the treatment affected the girls and boys similarly).

Wave 3

Six months after the intervention (Wave 3 within the law and justice treatment model), we found that girls perpetrated fewer incidents (frequency) of sexual peer victimization than boys [β=−.081 (.036), p = .024], and that girls perpetrated fewer incidents (frequency) of sexual dating victimization than boys [β=−.079 (.029), p = .007].

Over the same period, statistically significant differences were observed for the law and justice treatment [β=−.156 (.076), p = .043] compared to the control group for the prevalence of "any" peer violence (suggesting that the interventions decreased the perpetration of peer violence). Similarly, the law and justice treatment was associated with lower levels of the prevalence of perpetrating peer non-sexual (physical) violence [β=−.153 (.071), p = .034]. However, statistically significant differences were observed for the law and justice treatment [β = .187 (.087), p = .036] compared to the control group for the frequency of perpetrating "any" dating violence and the frequency of perpetrating dating sexual violence [β = .072 (.032), p = .025]. These last two findings suggest that the interventions increased the perpetration of dating violence and dating sexual violence. Of note, no significant differences were observed for the treatment multiplied by gender interaction terms for the perpetration variables in Wave 3 (indicating the treatment affected the girls and boys similarly).

Discussion

In an earlier paper (see Taylor et al. 2010), we demonstrated the effectiveness of two approaches to youth GV/SH prevention programming. While most research on this topic has been on programs that target older middle/high school students, to serve as a primary prevention effort, we geared our intervention towards studying sixth and seventh grade students and found largely positive findings on effectiveness. In this paper, we explored whether these largely positive findings remain for both girls and boys, including whether girls experience higher levels of peer or dating violence than boys. Based on our analyses presented in this paper, the introduction of a gender variable substantively altered one of our original findings regarding whether our interventions reduced the perpetration of some forms of peer violence. Also, we found differences in levels of victimization and perpetration of peer and dating violence for boys compared to girls. Below we summarize our findings on whether treatment was more effective while controlling for gender effects, whether our treatment multiplied by gender interaction was statistically significant, and overall differences in rates of violence and perpetration for girls compared to boys.

Victimization

As reported in our earlier paper (see Taylor et al. 2010), we also found that six months after the intervention (Wave 3), statistically lower rates for the prevalence and frequency of peer sexual violence victimization for the interaction-based

treatment. That is, we confirmed our earlier finding of less peer sexual violence victimization for those in the interaction-based treatment (but not law and justice-based treatment) compared to the control group even when controlling for the variable of gender, and gender multiplied by treatment interaction term. Regarding our primary research question, we observed no statistically significant differences for the treatment multiplied by gender interaction terms for any of the victimization variables in Waves 2 or 3. Our results suggest that treatment was equally as effective for girls and boys on this measure.[18] This positive finding is encouraging in our efforts to reduce violence for all students, for our analyses identified that during the intervention period (Wave 2 within the interaction-based treatment model) boys experienced more sexual victimization from peers than girls experienced from peers,[19] and more "any" victimization and non-sexual victimization from dates than girls experienced from dates. Also, six months after the intervention (Wave 3), boys were still experiencing more sexual victimization from peers than girls were experiencing from peers, but were also now experiencing more "any" victimization and non-sexual victimization from peers than girls. In terms of violence by dating partners, six months after the intervention, boys were still experiencing more "any" victimization and non-sexual victimization from dates than girls, but were also now experiencing more sexual victimization from dates than girls.[20]

Perpetration

As reported in our earlier paper (see Taylor et al. 2010), we also found that during the intervention period (Wave 2) statistically higher levels of prevalence of "any" violence against a dating partner for both treatments compared to the control group, and that the interaction-based treatment was associated with higher levels of the prevalence of perpetrating sexual violence with dating partners (also at Wave 2). Along the same lines, we found statistically higher levels of the frequency of perpetrating "any" dating violence and sexual violence against dating partners six months after the intervention for the law and justice treatment compared to the control group. These findings suggest that the interventions increased the perpetration of "any" dating violence and dating sexual violence. However, when we introduce a gender variable and a treatment multiplied by gender interaction term we now have an encouraging finding on our perpetration of peer violence measures. That is, six months after the intervention, statistically significant reductions were observed for the law and justice treatment compared to the control group for the prevalence of perpetrating "any" peer violence and peer non-sexual violence. Suggesting that the interventions decreased the perpetration of peer "any" violence and non-sexual violence. Below, we discuss the implications of our finding that

[18] Conversely, our findings also demonstrate our interventions to be equally as ineffective on all of our other non-significant victimization outcome measures.

[19] As stated in the measures section, our definition of sexual violence includes a range of very serious forms of sexual assault plus behaviors such as "butt grabbing."

[20] Students were asked the following two questions regarding sexual violence: "Have any of your PEERS ever done any of the following things to you? Pushed, grabbed, shoved, or kicked you in your private parts? Made you touch their private parts or touched yours when you did not want them to?

dating violence perpetration increased with treatment but that peer violence perpetration decreased with one of the treatments.

Regarding our primary research question, we observed no statistically significant differences for the treatment multiplied by gender interaction terms for any of the perpetration outcome variables in Waves 2 or 3. Our results suggest that the treatment had similar effects on the girls and boys on all of our perpetration measures. Despite this finding, we did observe that during the intervention period (Wave 2 within the interaction-based treatment model), that boys perpetrated more sexual dating victimization (prevalence and frequency) than girls. Six months after the intervention (within the law and justice treatment model), we found that boys also perpetrated more incidents (frequency) of sexual victimization against peers and dating partners than girls.

Implications of treatment findings

Both interventions were designed to prevent GV/SH. Two of our measures indicate that at least one of the interventions reduced peer sexual violence victimization or reduced peer perpetration. However, another measure indicated that dating perpetration increased. One possible explanation for the iatrogenic finding regarding dating violence perpetration is that as students were exposed to these lessons, they may have reflected on past behaviors associated with dating that had previously seemed normal, and now after the treatment, they viewed as acts of violence. However, the control group did not have any exposure to the interventions and likely continued to fail to identify their dating behavior as GV/SH. In the context of dating, students in the control group not exposed to the lessons might still have a hard time recognizing their behavior with dating partners as GV/SH, perhaps even believing that GV/SH is a normal part of a relationship. However, in the area of peer victimization or peer perpetration, the control group has fewer problems recognizing their behavior as GV/SH—leading to the result that one of the treatment groups has a lower rate of peer victimization and a lower rate of peer perpetration than the control group. Under this rationale, the interventions might have affected the student's sensitivity to the problem of GV/SH, and it made it more likely for them to identify and report certain dating behaviors as GV/SH. It is possible that this iatrogenic finding (increase in dating violence perpetration) is due to reporting issues as opposed to actual behavioral changes in GV/SH levels. The fact that there was not also an increase in dating victimization supports the possibility that some students might have exaggerated their reporting of violence or were more sensitized to recognizing certain behaviors as GV/SH. That is, if perpetration increased, we would likely have seen an increase in victimization (but we did not). Future research will need to consider this type of reporting problem, and design measurement strategies to disentangle these issues (e.g., build in questions distinguishing between actual behavioral changes and perceptual changes about behavior).

The other possibility is that this is just an anomalous finding. With two measures indicating that peer victimization and peer perpetration decreased for one of the treatment groups, and only one measure suggesting an increase in dating violence associated with treatment, the iatrogenic finding could be a spurious result.

Implications of gender findings

Overall, we observed in our study data that boys are more involved in violence than girls: both as victims and perpetrators. Boys experienced significantly more of all three types of victimization from peers and dating partners compared to what girls experienced at the hands of their peers and dating partners.[21] As perpetrators, boys committed more sexual victimization against peers (Wave 2 only) and more sexual victimization against dating partners (Waves 2 and 3) than girls did as perpetrators. Our findings on perpetration are congruent with findings showing that boys are more physically aggressive than girls (Dodge et al. 2006; Foshee and Matthew 2007; Wolfe et al. 2009). Our finding of greater involvement of boys in violence compared to girls is also consistent with the general criminological literature of males more likely to be both the perpetrators and victims of violence than females.[22] Girls may be more concerned with conformity and following school rules, and care more about "not getting in trouble." Girls that perpetrate violence may get more noticed, especially when they act in sex role atypical or sexually deviant behavior (Stein 1995; Brown et al. 2003, 2007; Chesney-Lind 2005).

We were surprised to observe that boys were more likely to be victims of sexual violence than girls. One possibility is that schools are more geared to combat sexual violence against girls but largely ignore boys that are sexually victimized by either girls or boys. Schools may be inadvertently sending the wrong measure to boys. Boy victims are told to "walk it off." Boy perpetration of violence may be dismissed as "boys being boys." Another possibility relates to a limitation in our study measures of sexual violence. Our measure of sexual violence includes a range of very serious forms of sexual assault but also behaviors such as pushing, grabbing, shoving, or kicking someone in their private parts. These items are all in one of our survey questions and cannot be disentangled. Therefore, it may be that boys are experiencing more behaviors such as "butt grabbing" as opposed to rape. Future research will need to consider including more detailed measures of sexual violence in the student surveys.[23]

Future developments

The many non-significant findings and both positive and iatrogenic findings suggests that there is likely a need for further refinements in our interventions.

[21] More specifically, boys experienced more sexual victimization, "any" victimization (Wave 3 only) and non-sexual victimization (Wave 3 only) from peers, and more "any" victimization, non-sexual victimization, and sexual victimization (Wave 3 only) from dating partners than girls.

[22] Based on data from the National Crime Victimization Survey (NCVS) from 1973 to 2006, males have experienced higher rates of victimization for violence than females for all types of violent crime except rape/sexual assault (see http://www.ojp.usdoj.gov/bjs/glance/vsx2.htm). Also, males perpetrate much more crime than females regardless of whether the data analyzed are arrest rates, victimization reports on characteristics of offenders, or self-reports of criminal behavior (Heimer 2000).

[23] However, this will be a real challenge. Based on our experience working in schools, districts are very concerned about including sexual assault measures on surveys due to the potential negative feedback they may receive from parents. Researchers may need to work with parent groups to explain the rationale for these measures and carefully work through the wording of these items on surveys to get approval for more detailed items.

Future research should further investigate the interaction-based versus law and justice based curricula to provide further information as to which components are most successful or deleterious in reducing GV/SH. It would also be important to learn if booster sessions might be needed to enhance the intervention or if the curricula need to be longer than five sessions. We might also consider expanding the target of our intervention to saturate the whole middle school environment to include the 8th grade, as well as the sixth and seventh grades. Along with some changes to the intervention, future research will also need to consider if the effects detected at up to six months post intervention hold up after a year or more post intervention. Longer longitudinal research might help us sort through our mixed findings (e.g., perhaps the positive findings will continue to be measured but the iatrogenic findings may dissipate). Future researchers might also consider adding a qualitative component involving detailed interviews with students receiving the intervention to explore any possible iatrogenic effects. For example, is the intervention leading to real negative results or just increasing the reporting of it by those in the intervention?

Concluding comments

On balance, we believe we have mixed findings regarding the efficacy of our interventions in reducing perpetration. First, we have many non-statistically significant findings. As discussed earlier, with a sample of 1,639 students across 123 study classrooms, we had a good degree of statistical power to find small to medium effect sizes. Therefore, our absence of statistically significant findings could be a reflection of the modest effects on behavior that this type of prevention programming can have, as opposed to a by-product of one of our study features. Next, while two of our measures indicate that at least one of the interventions reduced peer sexual violence victimization or reduced peer perpetration, another measure indicated that dating perpetration increased. To sort through these mixed findings, more experimental research is needed to provide greater clarity to our findings in additional cities. However, some modifications may be needed in the tested interventions, as discussed above, to address the possibility of iatrogenic results. Also, additional study measures should be incorporated to address the possibility of iatrogenic results and help document why they may be emerging.

Nevertheless, there is some encouraging news based on our results. We now have an emerging sense of the types of lessons and pedagogy that can be helpful for students in sixth and seventh grades, under certain circumstances, in the area of reducing student-to-student violence. We also observed that the treatment had similar effects on girls and boys. There are positive implications to this finding, given our corresponding results that boys are more involved in violence than girls (both as victims and perpetrators). That is, we are now hopeful that building on our research, school districts will be in a better position to adopt interventions and then observe reductions in student-to-student violence with both boys and girls.

Appendix 1

Table 3 HLM Outcomes

Questions	Wave 2		Wave 3	
	Interaction-based treatment	Law and Justice	Interaction-based treatment	Law and Justice
Q1. Peer victimization				
Prevalence of any violence				
Treatment (1=treatment, 0=control)	−.032 (.093)	.084 (.102)	−.036 (.110)	.007 (.102)
Gender (1=female)	−.010 (.078)	.074 (.087)	−.084 (.101)	−.129 (.097)
Treatment × gender	−.232 (.159)	−.013 (.164)	.002 (.196)	−.107 (.215)
Frequency of any violence				
Treatment (1=treatment, 0=control)	−.151 (.148)	.125 (.161)	−.250 (.224)	.029 (.224)
Gender (1=female)	−.048 (.128)	.013 (.140)	−.257 (.180)	−.439 (.193) *
Treatment × gender	−.309 (.265)	−.060 (.271)	.379 (.369)	−.158 (.419)
Prevalence of sexual violence				
Treatment (1=treatment, 0=control)	.013 (.027)	.010 (.026)	−.071 (.035) *	−.008 (.036)
Gender (1=female)	−.044 (.021) *	−.020 (.022)	−.046 (.031)	−.067 (.032) *
Treatment × gender	−.024 (.045)	.049 (.046)	.045 (.063)	−.020 (.068)
Frequency of sexual violence				
Treatment (1=treatment, 0=control)	.000 (.039)	.006 (.039)	−.144 (.065) *	.010 (.071)
Gender (1=female)	−.058 (.033)	−.022 (.033)	−.128 (.054) *	−.172 (.059) **
Treatment × gender	−.008 (.071)	.102 (.070)	.192 (.114)	.061 (.126)
Prevalence of non-sexual violence				
Treatment (1=treatment, 0=control)	−.053 (.080)	.080 (.090)	.027 (.091)	.019 (.084)
Gender (1=female)	.011 (.069)	.070 (.076)	−.072 (.086)	−.094 (.082)
Treatment × gender	−.204 (.141)	−.072 (.146)	−.035 (.168)	−.090 (.177)
Frequency of non-sexual violence				
Treatment (1=treatment, 0=control)	−.156 (.127)	.131 (.141)	−.244 (.222)	.034 (.179)
Gender (1=female)	−.019 (.111)	.015 (.124)	−.259 (.180)	−.321 (.159) *
Treatment × gender	−.303 (.232)	−.179 (.241)	.366 (.373)	−.231 (.337)
Q3. Dating victimization				
Prevalence of any violence				
Treatment (1=treatment, 0=control)	.024 (.045)	.003 (.043)	.062 (.058)	.022 (.055)
Gender (1=female)	−.078 (.039) *	−.019 (.041)	−.131 (.053) *	−.106 (.052) *
Treatment × gender	−.108 (.082)	.074 (.085)	.074 (.116)	.128 (.109)
Frequency of any violence				
Treatment (1=treatment, 0=control)	.007 (.066)	−.002 (.065)	.032 (.109)	.045 (.116)
Gender (1=female)	−.112 (.060)	−.040 (.058)	−.260 (.104) *	−.301 (.110) **
Treatment × gender	−.037 (.122)	.185 (.119)	.322 (.222)	.197 (.233)
Prevalence of sexual violence				
Treatment (1=treatment, 0=control)	−.006 (.018)	−.008 (.014)	.011 (.021)	.011 (.020)
Gender (1=female)	−.008 (.014)	.008 (.013)	−.016 (.019)	−.018 (.018)
Treatment × gender	−.028 (.029)	.012 (.027)	.038 (.041)	.025 (.039)

Table 3 (continued)

Questions	Wave 2		Wave 3	
	Interaction-based treatment	Law and Justice	Interaction-based treatment	Law and Justice
Frequency of sexual violence				
Treatment (1=treatment, 0=control)	−.007 (.024)	−.002 (.019)	.017 (.041)	.027 (.040)
Gender (1=female)	−.004 (.018)	.021 (.017)	−.049 (.038)	−.074 (.037) *
Treatment × gender	−.031 (.038)	.031 (.036)	.129 (.082)	.043 (.080)
Prevalence of non-sexual violence				
Treatment (1=treatment, 0=control)	.035 (.036)	.009 (.036)	.053 (.044)	.010 (.043)
Gender (1=female)	−.073 (.033) *	−.031 (.034)	−.119 (.040) **	−.096 (.040) *
Treatment × gender	−.079 (.069)	.062 (.071)	.035 (.088)	.099 (.085)
Frequency of non-sexual violence				
Treatment (1=treatment, 0=control)	.020 (.058)	−.003 (.056)	−.106 (.148)	.019 (.086)
Gender (1=female)	−.109 (.054) *	−.063 (.050)	−.102 (.134)	−.241 (.082) **
Treatment × gender	−.001 (.108)	.153 (.103)	.059 (.289)	.144 (.173)
Q4. Peer perpetration				
Prevalence of any violence				
Treatment (1=treatment, 0=control)	−.014 (.070)	−.012 (.080)	−.006 (.078)	−.156 (.076) *
Gender (1=female)	.054 (.060)	.012 (.061)	−.053 (.076)	−.064 (.073)
Treatment × gender	−.004 (.126)	−.116 (.133)	.009 (.161)	−.057 (.161)
Frequency of any violence				
Treatment (1=treatment, 0=control)	−.042 (.117)	−.043 (.130)	−.106 (.148)	−.193 (.144)
Gender (1=female)	−.020 (.100)	−.046 (.100)	−.102 (.134)	−.165 (.141)
Treatment × gender	.092 (.210)	.056 (.220)	.059 (.289)	−.249 (.303)
Prevalence of sexual violence				
Treatment (1=treatment, 0=control)	.011 (.015)	−.008 (.014)	−.012 (.018)	−.001 (.019)
Gender (1=female)	.007 (.015)	.009 (.014)	−.028 (.018)	−.034 (.019)
Treatment × gender	−.003 (.032)	−.005 (.027)	.019 (.037)	−.005 (.039)
Frequency of sexual violence				
Treatment (1=treatment, 0=control)	.023 (.021)	.005 (.022)	−.034 (.034)	.004 (.037)
Gender (1=female)	−.004 (.021)	.018 (.021)	−.045 (.033)	−.081 (.036) *
Treatment × gender	−.018 (.044)	.036 (.043)	.080 (.068)	−.033 (.074)
Prevalence of non-sexual violence				
Treatment (1=treatment, 0=control)	−.023 (.068)	.000 (.076)	.007 (.075)	−.153 (.071) *
Gender (1=female)	.035 (.057)	−.003 (.057)	−.030 (.068)	−.037 (.065)
Treatment × gender	.004 (.115)	−.114 (.124)	.000 (.145)	−.048 (.144)
Frequency of non-sexual violence				
Treatment (1=treatment, 0=control)	−.057 (.114)	−.040 (.125)	−.066 (.137)	−.194 (.129)
Gender (1=female)	−.033 (.095)	−.070 (.093)	−.061 (.117)	−.098 (.120)
Treatment × gender	.100 (.195)	.018 (.205)	−.020 (.256)	−.208 (.261)
Q6. Dating perpetration				
Prevalence of any violence				
Treatment (1=treatment, 0=control)	.071 (.030) *	.064 (.032) *	.059 (.039)	.072 (.042)
Gender (1=female)	.022 (.026)	.037 (.030)	−.003 (.036)	.006 (.040)
Treatment × gender	−.051 (.057)	−.052 (.063)	−.024 (.077)	−.007 (.084)

Table 3 (continued)

Questions	Wave 2		Wave 3	
	Interaction-based treatment	Law and Justice	Interaction-based treatment	Law and Justice
Frequency of any violence				
Treatment (1=treatment, 0=control)	.086 (.044)	.065 (.044)	.055 (.062)	.187 (.087) *
Gender (1=female)	.005 (.039)	.035 (.042)	−.042 (.058)	−.091 (.082)
Treatment × gender	−.104 (.086)	−.053 (.086)	−.020 (.123)	−.151 (.174)
Prevalence of sexual violence				
Treatment (1=treatment, 0=control)	.020 (.010) *	.017 (.010	.019 (.015)	.031 (.015)
Gender (1=female)	−.022 (.009) *	−.012 (.010)	−.012 (.013)	−.019 (.014)
Treatment × gender	−.025 (.019)	.001 (.020)	−.003 (.029)	−.018 (.030)
Frequency of sexual violence				
Treatment (1=treatment, 0=control)	.037 (.019)	.024 (.016)	.019 (.025)	.072 (.032) *
Gender (1=female)	−.037 (.016) *	−.020 (.016)	−.040 (.023)	−.079 (.029) **
Treatment × gender	−.047 (.034)	−.005 (.032)	.014 (.049)	−.067 (.062)
Prevalence of non-sexual violence				
Treatment (1=treatment, 0=control)	.050 (.028)	.046 (.028)	.040 (.031)	.039 (.033)
Gender (1=female)	.048 (.027)	.048 (.027)	.015 (.029)	.033 (.032)
Treatment × gender	−.029 (.052)	−.055 (.057)	−.025 (.061)	.002 (.067)
Frequency of non-sexual violence				
Treatment (1=treatment, 0=control)	.049 (.041)	.040 (.040)	.035 (.047)	.113 (.066)
Gender (1=female)	.047 (.036)	.056 (.037)	.003 (.044)	−.004 (.062)
Treatment × gender	−.063 (.078)	−.051 (.080)	−.041 (.094)	−.090 (.130)

(*$p < .05$, **$p < .01$

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