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Shifting Boundaries: An Experimental Evaluation of a Dating Violence Prevention Program in Middle Schools

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Abstract We randomly assigned the *Shifting Boundaries* interventions to 30 public middle schools in New York City, enrolling 117 sixth and seventh grade classes (over 2,500 students) to receive a classroom, a building, a combined, or neither intervention. The classroom intervention included a six-session curriculum emphasizing the laws and consequences for perpetrators of dating violence and sexual harassment (DV/H), the social construction of gender roles, and healthy relationships. The building-based intervention included the use of building-based restraining orders, higher levels of faculty/security presence in safe/unsafe "hot spots" mapped by students, and posters to increase DV/H awareness and reporting. Student surveys were implemented at baseline, immediately after the intervention, and 6-months post-intervention. As hypothesized, behaviors improved as a result of the interventions. The building-only and the combined interventions were effective in reducing sexual violence victimization involving either peers or dating partners at 6-months post-intervention. This was mirrored by reductions in sexual violence perpetration by peers in the building-only intervention. While the preponderance of results indicates that the interventions were effective, an anomalous result (increase in sexual harassment victimization reports that was contradicted by lower frequency estimates) did emerge. However, after analysis these anomalous results were deemed to be most likely spurious. The success of the building-only intervention alone is important because it can be implemented with very few extra costs to schools.

Keywords Teen dating violence · Youth violence prevention · Middle schools · Experiment

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Introduction

Dating violence and sexual harassment (DV/H) (including "interpersonal" or "gender" violence)[1] among adolescents in school settings is pervasive and associated with a number of problems (Jouriles et al. 2009; Mulford and Giordano 2008). DV/H can lead to serious injuries for victims, poorer mental/physical health, more "high-risk"/deviant behavior, and increased school avoidance (Gruber and Fineran 2008; Howard et al. 2007a, b). In their review of the DV/H prevention research, Cornelius and Resseguie (2007) note that most

[1] In this report, we use the term *dating violence and harassment* (DV/H) to represent physical, emotional, or sexual abuse within a dating relationship, the definition that CDC uses for teen dating violence (TDV) (Centers for Disease Control and Prevention 2010). Where cited studies used the term TDV, we also follow the language of the original research.

of these evaluations have documented at least a short-term positive change in knowledge and/or attitudes related to youth DV/H prevention. However, many of these studies did not use randomized experiments or other rigorous designs. In the last few years, new rigorous research has been conducted on the effectiveness of youth DV/H prevention programs (Foshee and Reyes 2009; Jaycox et al. 2006; Taylor et al. 2010a; Wolfe et al. 2009). However, these studies are few and generally address only eighth and/or ninth grade or older students. Some research indicates that adolescents may experience DV/H and sexual harassment as early as sixth grade (Callahan et al. 2003; Eaton et al. 2010; O'Keefe 1997), suggesting that prevention programs should target students in middle school (Espelage and Holt 2007; McMaster et al. 2002; Wolitzky-Taylor et al. 2008). According to one sample of seventh grade students who indicated that they have begun dating, one-third reported having committed acts of physical, sexual, or psychological aggression toward their dating partner (Sears et al. 2007). Finally, DV/H during adolescence is a significant risk factor for young adult intimate partner violence (Gómez 2010); as much as half of teen dating violence may persist into adulthood (Halpern et al. 2009).

There has only been one evaluation (Taylor et al. 2010a) addressing sixth and/or seventh grade students that that assessed behavioral measures with an experimental design (Cornelius and Resseguie 2007; Whitaker et al. 2006). Evaluating two components of a DV/H prevention program for sixth and seventh grade students in middle schools bordering Cleveland, overall, we found that the intervention improved knowledge and attitudes related to youth dating violence and reduced self-reported peer violence victimization and self-reported perpetration (Taylor et al. 2010a). There was a conflicting finding regarding self-reported dating violence perpetration. The intervention seemed to increase self-reported dating violence perpetration (but not self-reported dating violence victimization). This iatrogenic finding was examined closely and was interpreted to be most likely due to reporting issues as opposed to actual increases in perpetration between the intervention and control group (Taylor et al. 2010a). Our team's research was important because it demonstrated through an experiment that a condensed five-session classroom curriculum could be effective for a group as young as sixth and seventh grade students. The qualitative aspects of the research were also useful to expanding and honing the intervention applied in New York City (NYC) as described below. Although not a replication of this Cleveland study, the current study builds on this work in assessing modified versions of the classroom curricula from this earlier study and adding school building-wide intervention components.

In this paper we provide the results of an evaluation that used a randomized controlled trial of a DV/H prevention program for sixth and seventh grade students in NYC. Our purpose was to provide high-quality scientific evidence concerning the effectiveness of targeting a young, universal primary prevention audience with interventions at multiple levels. The study was designed to yield data that could help increase the capacity of schools to prevent DV/H. We hypothesized that the interventions will reduce sexual harassment in all three groups that receive any one of the three interventions compared to the control group. Further, we expected the three interventions would reduce the occurrence of dating and peer violence compared to the control group. These two overarching hypotheses applied to all the treatment conditions. Our final hypothesis was that creating a broader environmental intervention (the combined treatment of the classroom and building-level interventions) would be more effective in reducing sexual harassment and violence than the classroom intervention on its own. We proposed no hypothesis comparing the classroom-only to the building-only interventions because there is no basis in theory.

Methods

Our study employed a multi-level, experimental, longitudinal design, with data collection taking place from September 2009 to June 2010 in NYC, the largest school district and one of the most ethnically, linguistically, and racially diverse populations in the U.S. Our team randomly assigned a building-based and classroom-based intervention through a stratification process with 30 public middle schools. With the exception of three schools (which had three instead of four classrooms in the study), each school included two sixth and two seventh grade classrooms in each building, yielding a total of 117 classrooms (n=58 classes in sixth grade plus 59 classes in seventh grade) and 2,655 students. An average of 354 students participated in our study from each of the 30 school buildings. We had good statistical power (80 %) to find differences even as small as 8 % between the treatment and control groups; see project final report at https://www.ncjrs.gov/pdffiles1/nij/grants/236175.pdf for greater detail (Taylor et al. 2011). We used a stratified random allocation procedure (Boruch 1997). Schools were classified by two stratifying criteria (school size and borough), ensuring that the comparison groups started out with some identical characteristics and adequate numbers of schools in each of the study cells. The schools were assigned to one of the four cells: (1) receive the building and classroom interventions, (2) receive the building-only intervention, (3) receive the classroom-only intervention or (4) control group (in which schools/students experienced their normal class schedule, without receiving any elements of our classroom-or building-level interventions). Within each of these cells, a random sample of classrooms was selected for study participation to complete all three waves of the survey.

Description of '*Shifting Boundaries*' Interventions

The design of our interventions was informed by the theory of reasoned action (TRA) (Ajzen and Fishbein 1980; Fishbein 1967). Based on TRA, attitudes toward and perceived norms about the desired behavior facilitate the intention to change, modify, or adopt a particular behavior. The TRA model served a valuable function of orienting the developer of *Shifting Boundaries* to consider the environmental context that surrounds and influences intentions and behavior. The addition of the building-level component was also added based on recommendations from an NIJ/NIH teen dating violence expert meeting (Dec. 4–5, 2007) to add other components to classroom-based interventions. Below is a summary of our interventions, including classroom-and building-wide activities.

Classroom-Based Intervention The NYC classroom-based intervention synthesized the lessons from the two components (a personal interaction component and a Law & Justice Treatment) from our earlier study that the Cleveland area interventionists concurred were the most successfully received by students. Our team further refined the classroom-and building-based (see below) interventions with significant input from the New York City Department of Education (NYC DOE) central office personnel. The lessons were implemented by trained school personnel known as SAPIS (Substance Abuse Prevention and Intervention Specialists), generally over a period of 6–10 weeks. The six-session curriculum emphasized the consequences for perpetrators of DV/H, state and federal laws related to DV/H, the setting and communicating of one's boundaries in interpersonal relationships, and the role of bystanders as interveners. The key feature of the classroom curriculum is the framing of activities to help students determine and set personal boundaries. Educators introduce the concept of boundaries and teach about the constraints of relevant laws. Using the curriculum, educators prompt students to consider their interpersonal interactions and use of physical spaces within the school walls. Activities included exploring the concepts of laws and boundaries, plotting the shifting nature of personal space, considering laws as they apply by gender and activities related to sexual harassment prevention. The lessons employed both concrete and applied materials, as well as activities requiring abstract thinking.

Building-Based Intervention Our building-level interventions include the following features: the introduction of temporary building-based restraining orders (termed a *Respecting Boundaries Agreement* or RBA), and the placement of posters in school buildings to increase awareness and reporting of DV/H to school personnel. In addition, building on research by Astor et al. (1999, 2001), our building intervention includes a third component to help schools work with students to identify any unsafe areas of schools through hotspot mapping. The students developed maps which were in turn used to plan for a greater presence of faculty or school security personnel in identified "hot spots." These building-based components also aim to have students develop a greater sense of respect for personal boundaries, as with the classroom curriculum, but through different mechanisms, as described above.

To promote greater comparability across our interventions, we applied the same basic "dosage" for the building intervention as we applied for the classroom lessons. That is, the building interventions were conducted for the same number of weeks as the classroom-based intervention (about 6–10 weeks).

Data Collection

School personnel trained by our research team administered pencil-and-paper surveys. The school staff distributed surveys immediately before schools were assigned to one of the four study conditions, immediately after the treatment (or control condition) was completed, and about 6 months after the intervention (post school assignment in the case of control schools). The student response rate was 93 % at the baseline survey, with no statistically significant differences observed for the treatment and control groups on participating in the baseline survey. Eight-seven percent of participating students completed the survey immediately after the intervention and 82 % completed the 6-month follow-up survey. There were no statistically significant differences for the treatment and control groups on participating in the first or second follow-up surveys. Following approved IRB protocols (NYC DOE and Police Executive Research Forum), in advance of survey administration, parents were individually informed of the goals of the study and accompanying risks and benefits in a form through which they could choose to waive their parental consent for their child to participate. Parental consent included permission for the students to complete a baseline and all of the subsequent follow-up surveys. Students were asked to return parent/guardian decline forms to the school as soon as possible (parents/guardians were told that nothing had to be done if they chose to allow their child to participate in the survey). For students whose parents chose to waive consent (i.e., provided passive consent), school personnel distributed child assent forms to the students prior to survey implementation. The surveys took about 40 min to complete (one classroom period) and were administered during regular school hours.

Measures

Sexual Harassment Victimization and Perpetration The surveys included prevalence and incidence questions on the experience of being a victim and/or perpetrator of sexual harassment. Greater detail and copies of the actual surveys

used in our study to measure harassment and all of our other measures can be found in the project Final Report (Taylor et al. 2011). A response of "yes" any of the following items was coded "1" and the sum was coded as a dichotomous variable marking any respondent with a value of one or greater for *sexual harassment prevalence* (victimization and perpetration separately coded). The composite frequency measures (victimization and perpetration separately coded) for *sexual harassment frequency* was coded as the sum total of the following values for each categorical response (0 coded as 0, 1–3 coded as 2; 4–9 coded as 6.5; 10+ coded as 10) for each sexual harassment item. Sexual harassment questions included: (a) made sexual comments, jokes, gestures, or looks; (b) showed, gave, or left sexual pictures, photographs, messages, or notes about you; (c) wrote sexual messages or graffiti about you on bathroom walls, in locker rooms, or other places; (d) spread sexual rumors about you; said you were gay or a lesbian, as an insult; spied on you as you dressed or showered at school; (e) "flashed" or "mooned" you; (f) touched, grabbed, or pinched you in a sexual way; (g) intentionally brushed up against you in a sexual way; (h) pulled at your clothing in a sexual way; (i) pulled your clothing off or down; (j) blocked your way or cornered you in a sexual way; (k) made you kiss him or her; and (l) made you do something sexual, other than kissing. The items for this survey were adapted from other work (AAUW Educational Foundation 1993, 2001; Basile et al. 2009; Fineran and Bennett 1999) and were used in our Cleveland study (Taylor et al. 2010a). All of the sexual harassment victim and perpetrator measures have Cronbach's alpha scores above 0.80. We note that an anonymous reviewer of this manuscript raised concerns of decreased statistical power for alpha values below 0.80.

Sexual and Physical Violence Victimization and Perpetration We measured the prevalence and incidence of violence both in terms of victimization and perpetration, distinguishing the nature of the relationship (specifying whether the victim/perpetrator was a peer[2] or a dating partner[3]). These items were designed to assess the impact of DV/H programs (Foshee et al. 1998; Taylor et al. 2008; Ward 2002). The surveys included prevalence (yes/no) and incidence (number of times) questions on the experience of being a victim and/or perpetrator of sexual violence and physical/non-sexual violence by/of peers and people that you have dated.

[2] 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."

[3] 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."

Sexual violence prevalence (victimization and perpetration separately coded) was coded in the same manner as the sexual harassment coding: A response of "yes" any of the items was coded "1" and the sum was coded as dichotomous variable marking any respondent with a value of one or greater. The composite frequency measures (victimization and perpetration separately coded) for *sexual violence frequency* was coded as the sum total of the following values for each categorical response (0 coded as 0, 1–3 coded as 2; 4–9 coded as 6.5; 10+ coded as 10) for each of the following two items. Sexual violence items included: (a) pushing, grabbing, shoving, or kicking in the private parts; and (b) made you touch their private parts or touched yours when you did not want them to. A positive response to any one item in the physical or sexual violence category is coded as "1" in the dichotomous composite measure. The composite frequency measures for a given outcome (e.g., sexual victimization) are the sum total of the following values for each categorical response (0 coded as 0, 1–3 coded as 2; 4–9 coded as 6.5; 10+ coded as 10) for each relevant item (e.g., the frequency of recent sexual violence victimization equals the number of times in the past 6 months the respondent was pushed, grabbed, shoved, or kicked in the private parts plus the number of instances of unwanted 'private parts contact' reported by the respondent). Most of the violent victimization measures had Cronbach's alpha scores above .80, and only one measure was below the .70 level (the prevalence of any peer violence perpetration in Wave 1 at 0.60).

Behavioral Intentions The intention of the students to engage in or avoid violence is an important control measure (Jaffe et al. 1992; Wekerle and Wolfe 1999). We measured behavioral intentions by asking about willingness to intervene in harmful situations, avoid violence, engage in retaliatory behavior, and engage in violence. We provided a variety of scenarios for the students to consider in assessing their intentions to use or not use violence. From the behavioral intentions survey items (Taylor et al. 2010a; Ward 2002), we developed a single summed scale. All the intentions to reduce or avoid violence measures across Waves 1, 2, and 3 have Cronbach's alpha scores above 0.75.

DV/H Knowledge We also controlled for knowledge related to defining DV/H, its prevention, and consequences. Based on the knowledge index from our earlier work (Taylor et al. 2008), our knowledge measures included "true" or "false" questions about State rape laws, definitions of abuse and sexual harassment, resources for help, and sexual harassment myths. The items for this index were developed by the study team and pilot tested prior to use in NYC. Our knowledge measures across Waves 1, 2, and 3 had acceptable Cronbach's alpha scores (Nunnally and Bernstein 1994; Streiner and Norman 2003) of 0.66, 0.77 and 0.80.

Other Variables The surveys included demographic and background descriptors of the students, including age, gender, and ethnicity/racial background. We also included questions on prior attendance at an educational program about sexual assault, harassment, or violence, and individuals' history of dating.

Pre-treatment Study Arm Comparison and Sample Description

The 30 public middle schools in our study included 58 sixth grade classrooms and 59 seventh grade classrooms (n=2,655 students). The vast majority of the schools had a student body of mostly non-whites (86 % of the students in the 30 schools were non-white). The schools in our study have low levels of student mobility (out of the 30 schools only 7 % of the students leave the school each year), and 91 % of the students are in attendance each day. A third of the students are from families below the poverty level. The schools in our study are fairly large with on average 891 students in each, and on average 108 suspensions are issued each year in the 30 schools. The mean ratio of students to teachers is 14. Regarding academic performance, only 57 % of the students in the schools meet or exceed the minimum standards for math proficiency, and only 48 % of the students in the schools meet or exceed the minimum standards for reading proficiency. No statistically significant differences were observed across the four randomly assigned conditions based on these aggregate school characteristics.

Next we examined individual-level survey data from the baseline survey. A pre-treatment comparison of the intervention and control groups based on individual-level survey data from the baseline survey indicated that all four groups were similar regarding the following characteristics at baseline: Age, gender, prior experience with dating violence prevention programs, number of people dated for more than 1 week, length of prior dating relationships, any lifetime peer violence victimization, and any lifetime dating violence victimization. Despite random assignment, some small but significant pre-treatment differences in the treatment and control groups did emerge (Taylor et al. 2011) in the areas of race, dating history, and prior lifetime history of perpetrating violence and being a victim of sexual harassment (based on individual-level survey data). Overall, while we found few differences between the treatment and control conditions prior to the experiment, most of these were not very large differences. For the most part, the four study conditions were similar on the majority of our measures leaving the only major differences across the groups their assigned intervention or control condition. Additionally, random assignment procedures were followed closely. All schools assigned to treatment received their appropriate treatment. The same held true for the controls. We included the variables where there were pre-treatment differences into our later models as covariates to remove any potential biases these small imbalances might have presented (Armitage 1996).

The sample was fairly evenly split between sixth (n=1,266 students) and seventh grade students (1,388 students). Slightly more of the overall sample was female (53 %). About 34 % of our sample was Hispanic, and among students not self-identifying as Hispanic the distribution was 31 % African-American, 16 % Asian-American, 13 % white and the remainder in the "other" racial category). Over a third of the study sample (40 %) had prior experience with a violence prevention educational program. Nearly half of the sample (48 %) reported at least one experience of being in a dating relationship that lasted a week or longer. A relatively large number of sixth and seventh grade students had experienced sexual violence in dating (20 %) and peer (66 %) relationships at some point in their life. Further description of the sample at the individual level is provided in the project's final report (Taylor et al. 2011). All differences at the school level are controlled for in the analyses through individual characteristics and accounting for clustering by school.

Statistical Analyses

Given the nested nature of our data, variables at the student level, class level, and building level may be correlated. Because our substantive interest is in the individual outcomes, and because of the need to adjust for correlated standard errors, we do not present simple means for the treatment and control groups. We included a robust variance estimate to adjust for within-cluster correlation called the Huber/White/sandwich estimate of variance (Froot 1989; Huber 1967; Rogers 1993; White 1980; Williams 2000), the vce (cluster *clustvar*) option in Stata 8.0 . For our count data, we used a negative binomial regression with a robust variance estimate. We used logistic regression with a robust variance estimate for our prevalence outcome variables. To address missing data from partially completed questionnaires, we used multiple imputations in the analyses. We created five multiply imputed datasets in SPSS 18.0 (applying the fully conditional specification, an iterative Markov chain Monte Carlo (MCMC) method) and analyzed the datasets in Stata 8.0, which supports the analysis of multiple imputed data.

We modeled sexual harassment and sexually violent behavior outcomes in for Wave B (immediately post-treatment) and Wave C (about 6-months post-treatment). For each model we present only the treatment assignment variable (coded as "Building Only," "Classroom only," "Both/Combined" and the control group as the "reference" category) (see Table 1). However, where the intervention conditions were significantly effective at reducing the outcome (compared to the control), we also tested the relative effectiveness of the three separate interventions. In practice,

Table 1 Sexual harassment and sexual violence models

Outcome	Treatment condition	Immediately post intervention	Six months post intervention
Sexual Harassment Victimization: *Prevalence*	Building only	1.287 (.27)	2.067 (.48)**
	Classroom only	0.936 (.18)	1.208 (.21)
	Building & classroom	1.031 (.22)	1.180 (.24)
Frequency	Building only	0.912 (.11)	0.695 (.10)**
	Classroom only	0.881 (.12)	0.990 (.11)
	Building & classroom	0.896 (.11)	0.736 (.10)*
Sexual Harassment Perpetration: *Prevalence*	Building only	1.047 (.20)	1.161 (.18)
	Classroom only	0.995 (.18)	0.918 (.15)
	Building & classroom	0.838 (.16)	1.001 (.17)
Frequency	Building only	0.947 (.13)	0.658 (.12)*
	Classroom only	0.950 (.14)	0.963 (.13)
	Building & classroom	0.859 (.12)	0.744 (.13)
Peer Sexual Violence Victimization: *Prevalence*	Building only	1.013 (.17)	0.662 (.12)*
	Classroom only	0.902 (.15)	0.965 (.16)
	Building & classroom	0.680 (.12)*	0.659 (.11)**
Frequency	Building only	0.911 (.13)	0.654 (.13)*
	Classroom only	0.823 (.12)	0.929 (.13)
	Building & classroom	0.658 (.10)**	0.597 (.10)**
Peer Sexual Violence Perpetration: *Prevalence*	Building only	1.062 (.20)	0.527 (.11)**
	Classroom only	0.856 (.16)	1.115 (.18)
	Building & classroom	0.726 (.13)	0.524 (.10)***
Frequency	Building only	1.063 (.15)	0.605 (.12)*
	Classroom only	0.877 (.16)	1.027 (.13)
	Building & classroom	0.868 (.14)	0.644 (.11)**
Dating Sexual Violence Victimization: *Prevalence*	Building only	1.007 (.26)	0.498 (.12)**
	Classroom only	1.059 (.31)	0.919 (.19)
	Building & classroom	0.838 (.19)	0.843 (.18)
Frequency	Building only	0.971 (.22)	0.474 (.13)**
	Classroom only	1.044 (.25)	0.856 (.15)
	Building & classroom	0.809 (.17)	0.790 (.15)
Dating Sexual Violence Perpetration: *Prevalence*	Building only	1.045 (.30)	0.503 (.18)
	Classroom only	1.199 (.35)	1.038 (.26)
	Building & classroom	0.833 (.21)	1.013 (.25)
Frequency	Building only	0.938 (.20)	0.479 (.17)
	Classroom only	1.211 (.33)	0.946 (.22)
	Building & classroom	0.731 (.17)	0.947 (.22)

Adjusted for student age; gender; ethnicity/racial background; prior attendance at an educational program about sexual assault; student histories of harassment, violence, and dating; DV/H knowledge scores, and behavioral intentions. Our immediate post-treatment outcome models (Wave B) use our baseline (Wave A) covariates. Our 6-months post-intervention outcome models (Wave C) use our Wave B covariates (we also estimated this same Wave C outcome model with Wave A covariates and found that the results did not differ). *$p<.05$; ** $p<.01$; *** $p<.001$

because the results revealed the classroom-only intervention not to be effective, the only comparisons discussed are between the "building only" and the combined conditions. While not strictly necessary because we are working with experimental data, we also introduced a set of covariates to our outcome models. We adjusted for covariates to improve the precision of the treatment comparisons by reducing error variance and correcting for any major imbalances in the distribution of these covariates across the treatment and control groups that may have occurred due to chance (Armitage 1996; Gelber and Zelen 1986). We estimated models of Wave B outcome measures with baseline (Wave A) covariates. We present estimated models of Wave C outcome measures with Wave B covariates (we also estimated this same Wave C outcome model with Wave A covariates and found that the results did not differ).

Results

Sexual Harassment

Experienced Sexual Harassment as a Victim The results 6 months after the interventions were implemented indicated a treatment effect contrary to expectations. The odds ratio (OR) of students in the building-only intervention reporting the *prevalence* of any sexual harassment victimization was 107 % more than that of the control group (OR=2.07, p=.002). However, the *frequency* of sexual harassment victimization reported by students in the building-only intervention was 30.5 % lower than the reported frequency of sexual harassment victimization in the control group (Incidence Rate Ratio, IRR=.695, p=.014). Likewise, the frequency of sexual harassment victimization reported by students receiving the combined classroom and building intervention was 26 % lower than the reported frequency of sexual harassment victimization in the control group (IRR=.736, p=.026).

Given these findings, we directly compared the combined and the building-only interventions. The prevalence of sexual harassment victimization reports in schools receiving the combined treatment (building included) was 43 % lower (OR=.570, standard error, s.e.=.14, p=.022) than reports of sexual harassment victimization in schools receiving only the building treatment. Because the combined treatment was not significantly different than the control group, these results mean that while the building intervention appears to increase the reported prevalence of sexual harassment victimization, providing the building intervention in conjunction with the classroom intervention is neutral compared to no intervention.

Perpetrated Sexual Harassment Six months following the intervention, the reported prevalence of perpetrating sexual harassment was no different between the intervention and control groups. However, students in the building-only intervention arm reported a 34 % reduction in the frequency of perpetrating sexual harassment against others compared to control group reports (IRR=.658, p=.025).

Sexual Violence in Peer Relationships

Victimization by a Peer Immediately post-treatment, the results indicate a 32 % reduction in the prevalence of sexual victimization by a peer (OR=.68, p=.025) for students in the combined intervention arm compared to students in the control group. Immediately post-treatment, the estimated frequency of sexual victimization by a peer was also significantly lower (34 %) for students in the combined intervention arm compared to students in the control group (IRR=.658, p=.005). This finding persists 6-months post-treatment, at which point we estimate a 34 % reduction in the prevalence of sexual victimization by a peer (OR=.659, p=.011) for students in the combined intervention arm compared to students in the control group. This reduction was mirrored by results reported by students in the building-only intervention arm (OR=.662, p=.028). Further, the reported frequency of sexual victimization by a peer indicates the same positive effects of the building-only and combined classroom and building interventions. Six months post-treatment, results indicate a 35 % reduction in the frequency of sexual victimization by peers for students in the building-only treatment group (IRR=.654, p=.03) and a 40 % reduction in the frequency of sexual victimization by peers for students in the combined treatment group (IRR=.597, p=.002).

A direct comparison of the combined and the building-only interventions reveals that combined treatment lead to 33 % lower prevalence of reported victimization by peers compared to the control group and the "building only" group (OR=.671, s.e.=.11, p=.02) immediately post-treatment. This finding is supported by the post-intervention assessment of peer sexual violence victimization frequency, for which the combined intervention again is significantly more effective (28 %) than the building-only treatment (IRR=.722, s.e.=.11, p=.028).

Perpetration in a Peer Relationship Six-months post-intervention, students assigned to the building-only intervention as well as students participating in the combined classroom and building intervention reported significant lower prevalence of perpetrating sexual violence on peers. The reduction was comparable (approximately 47 %) for the two groups (building-only OR=.527, p=.002; combined intervention OR=.524, p=.001) in comparison to the control group. The reported frequency declined close to 40 % vis-à-vis the control group for students experiencing the building-only intervention (IRR=.605, p=.016) and the "both" intervention (IRR=.644, p=.009). However, there was no difference between the building-only intervention and the "both" intervention on this same measure of prevalence of perpetrating sexual violence on peers (IRR=.939, p=.778).

Sexual Violence in Dating Relationships

Victimization by a Dating Partner Six-months post-intervention, students in the building-only group reported 50 % reduction in the prevalence of sexual victimization by a dating partner (OR=.498, p=.007) and a 53 % reduction in the frequency of such events (IRR=.474, p=.011). Moreover, the building-only group reported a 40 % reduction in the prevalence of sexual victimization by a dating partner (OR=.59, s.e.=.14, p=.025) 6 months after the intervention compared to the "both" group. This is in contrast to the peer

victimization results, for which the combined treatment was more effective than the building-only treatment.

Perpetration in a Dating Relationship There was no statistically significant evidence for declines in perpetrating sexual violence against a dating partner for any of the interventions immediately post-treatment or 6 months later.

Discussion

We explored the effectiveness of a DV/H prevention program for sixth and seventh grade students in 30 middle schools. This sample size exceeds other published experiments on youth DV/H (Foshee et al. 2000; Jaycox et al. 2006; Wolfe et al. 2009) allowing for a more powerful examination of treatment effects. Therefore, even if fairly small statistical differences between the treatment and control groups were to emerge we would have a stronger probability of detecting those differences than earlier studies. We report on sexual harassment and sexual violence behavioral measures, although violence outcomes are sometimes not even measured in teen dating violence (TDV) prevention studies (Nightingale and Morrissette 1993; Rosen and Bezold 1996), where the focus has often been on attitude/knowledge changes (Macgowan 1997; Whitaker et al. 2006).

Regarding sexual harassment, overall, the building intervention was effective in reducing the frequency of both sexual harassment perpetration and victimization. While reports of the *prevalence* of any experience of sexual harassment victimization for students exposed to the building intervention increased at 6-months post-treatment, the *frequency* reported by students in the building-only intervention was lower, as were frequency reports from students in the combined classroom and building intervention. Further, when delivered in combination with the classroom intervention, the building intervention did not increase the reported prevalence of sexual harassment.

Regarding sexually violent behavior, the building-only treatment and the combined intervention were consistently effective in reducing sexual violence victimization involving either peers or dating partners at 6-months post-intervention. This was mirrored by reductions in sexual violence perpetration by peers for students in the building intervention. While the focus of the classroom intervention was on dating partner violence, we believe that the building intervention (with its broader prevention elements and relocation of school personnel based on hotspot mapping of all violent encounters) can be effective for addressing a variety of forms of sexual violence, even when combined with the classroom focus on dating relationships. This phenomenon of diffusion of benefits from interventions has been documented in other areas of criminal behavior such as hotspots policing of violent crime areas where areas near a treated area received similar benefits as the treated areas (Clarke and Weisburd 1994). Also, this finding of reductions in sexual violence is important given the general scarcity of positive results in reducing sexual violence in adults (Lonsway et al. 2009).

Although our earlier application of the classroom intervention in the Cleveland area was effective in reducing peer (but not dating) violence (Taylor et al. 2010b), in this NYC study the classroom component by itself was not effective in reducing either forms of violence. There could be a number of reasons for this discrepancy in results. It is possible that the intervention is not effective in different contexts outside the Midwestern, suburban environment of the Cleveland area study. The large urban, unique environment of NYC may interact with the nature of the classroom intervention, reducing its effectiveness. The personnel delivering the intervention varied across the Cleveland and NYC sites. Based on school administration preferences, in some Cleveland schools teachers implemented the interventions; in other schools, a rape crisis center prevention specialist delivered the lessons. By contrast in NYC, all of the lessons were implemented by school personnel called substance abuse prevention specialists. Further, this study was not a replication experiment. In Cleveland, we tested two forms of the classroom intervention: a 'law and justice' curriculum and an interaction-based curriculum. In NYC, we integrated the strongest components of each curriculum based on qualitative analyses, and it is possible that this integrated NYC curriculum lost some critical element present in the distinct Cleveland curricula. These results raise the question of the need for further experimentation regarding classroom curricula components, comparing the 'law and justice,' the interaction-based, and the integrated NYC curricula to a control condition.

We did believe that a building-level intervention would make an important addition to *Shifting Boundaries*, and had hypothesized that the combined approach would be more effective. Our data provide support for the value of this new building component both as a stand-alone intervention and implemented in combination with the classroom intervention. More specifically, our hypothesis that the broader environmental intervention (combined treatment) would be more successful in reducing DV/H than classroom alone was supported, in that the classroom intervention failed to achieve the program goals on its own. The success of the combined treatment in comparison to the building-only condition is mixed. In one case (for our *Dating* Sexual Violence Victimization Prevalence measure), building-only is better than the combined treatment, but in two cases (for our *Peer* Sexual Violence Victimization Prevalence and Frequency measures) the combined treatment is better than the building-only treatment. Thus, our initial inference that

the classroom intervention paired with the building intervention could be effective is partially supported.

An argument can be made that the classroom sessions could be effective, but they seem to need to be done in combination with the building intervention. It is possible that the broader focus of the building intervention creates some important changes in the diverse NYC middle school climate that allowed for the classroom intervention to have an effect. Future research will need to measure climate change to assess this hypothesis. The building-only intervention included more material that focused on violence prevention more broadly, while the classroom curriculum focused more particularly on dating violence. Perhaps adjusting school personnel for hotspots of violence can reduce peer violence as well as dating violence. These findings raise the question of whether we should be thinking of dating violence in the context of youth violence more broadly, rather than addressing dating violence as an isolated problem. This approach has been taken by others with some success (Wolfe et al. 2009).

There is clear potential for implementing the building intervention by itself. To date, most of the dating violence prevention efforts in schools have relied on classroom curricula, but we should not lose sight of the potential for other points for interventions. For example, online dating relationship simulation games that communicate an anti-violence message (e.g., see http://jenniferann.org/2010-game-runner-up-1.htm or www.refresheverything.com/gamechangers), and which youth can explore independently, could be promising. The accessibility of an effective building intervention requiring fewer resources in terms of teacher time, class time, and materials may be particularly appealing to school districts operating with constrained resources under duress to meet challenging academic targets. Given the mixed findings regarding the relative effectiveness of the building intervention implemented on its own versus in combination with the classroom curriculum, schools (districts) might want to consider a scaled program, initiating a building intervention and if resources allow working in the classroom to complement the building-level approach. A gradual "ramping up" from implementing just the building-only component and gradually introducing the classroom component may be the most realistic and feasible approaches for many middle schools.

Backfire/Iatrogenic Finding

Despite our mostly positive significant findings supporting the building and combined interventions, the result that that the building-only intervention increased the reporting of sexual harassment victimization (prevalence) was contrary to our expectations. This iatrogenic finding needs to be considered carefully, as it could have major implications for the interpretation of the rest of our results. While this finding may be spurious, we cannot summarily dismiss the possibility that the building-only intervention increased the proportion of students who were victims of sexual harassment and that the other desirable results are themselves spurious. However, we do not believe there is a basis for this type of interpretation. To begin with, the iatrogenic finding emerged only for the building-only intervention, which was also associated with many positive findings. We did not find any iatrogenic results for our classroom-only or our both interventions. Next, the iatrogenic finding only emerges on our sexual harassment prevalence measure (i.e., did X occur, yes or no), and is countered by desirable results on our frequency/incidence measures for the same variable (i.e., how often did X occur).

Furthermore, we need to consider the "other side of the coin" (i.e., sexual harassment perpetration), for which we observed a decreased frequency. While not directly comparable due to the different perspective of respondents when answering questions about victimization and perpetration, these measures do provide different accounts regarding the efficacy of the building intervention in addressing sexual harassment. That is, the intervention is focused on sixth and seventh grade students, but the victims may be reporting on violence and harassment from eighth grade students who were not the target of our intervention. Therefore, the perpetration measure may be a better gauge of the success of the intervention since the sixth and seventh grade students who received our intervention can report on their behavior against all students, and their lower rates of perpetration (inclusive of acts they may or may not perpetrate against non- sixth and seventh grade students) are an indicator of a successful outcome. We are also encouraged by the fact that there was nothing in our focus groups with students and interventionists (Taylor et al. 2011) that would suggest that the building intervention would have the effect of increasing sexual harassment victimization. Finally, we might be seeing a reporting effect. That is, the intervention may have sensitized students to recognizing that they are a victim or perpetrator so they were more likely to report this on the survey, but those who were truly victims or perpetrators may have experienced these events or perpetrated these acts less frequently. Under this interpretation, the treatment helped students recognize these acts as violence or harassment and helped decrease their frequency. In sum, we believe that while iatrogenic results need to be carefully considered, on balance the one negative does not offer a strong case for an alternative interpretation of the mostly positive/desirable results associated with our interventions.

Timing and Follow-Up

Our study was limited to two follow-up points (immediately following the intervention and about 6 months later), and it is unclear whether our findings would dissipate over a

longer follow-up period (Foshee et al. 2004) or hold up (Wolfe et al. 2009). Additionally, while we are suggesting that middle schools are an important intervention point for implementing *Shifting Boundaries*, more work needs to be done to assess its potential value (perhaps in a modified form) in high school settings. A booster version of *Shifting Boundaries* might be useful for students that already received the intervention in middle school, but a "first-time" version for high school might also have value and may not be "too late."

However, given rates of violence reported by middle school students, our study also suggests that the field may need to work with even younger groups to invoke a true primary prevention effort. While there is a field of research on preventing violence in elementary school ages (Clayton et al. 2001; Wilson et al. 2003), we are not aware of much work being done with elementary school students in the area of the primary prevention of youth dating relationship (or precursors to dating) violence. Since our intervention is designed for middle school students, our material would have to be adapted to be developmentally appropriate for elementary school students or new interventions would have to be designed. Knowledge regarding developmental patterns in dating violence is currently limited, but would inform outcomes studies varying effects at different time points. While developmental trajectories have been examined for elementary age children (Aber et al. 2003), to date, the TDV developmental trajectory literature reflecting more frequent measurement reveals a small number of studies, including: one small (n=192), short-term (24-months) Canadian study of 14–16 year-olds (Wolfe et al. 2003); a 3-year study of 13–19 year-olds (n=973) conducted in rural North Carolina modeling mean trajectories for each outcome (Foshee et al. 2009); and a study of 181 high school students (Nocentini et al. 2010). Such assessments of DV/H or TDV from a life-course trajectory approach (Elder 1998) should examine not only elementary school experience and violence but also whether these early experiences affect young adulthood relationships.

Limitations

First, we relied on self-report surveys which reflect the general limitations of self-reports (e.g., recall problems, telescoping of events, deliberate under-reporting or exaggerating of behavior) (Jackson et al. 2000). We recognize the possibility that there may be an interaction between the treatment condition and reporting. For example, perpetrators in one of the treatment groups may under-report violent behavior due to heightened awareness of the unacceptability and consequences of their behaviors. Victims in a treatment condition may also limit reports of their experiences so as not to be labeled as "a victim." Despite these concerns, confidential self-report surveys have become an accepted modality for collecting youth violence data.

Like others in this area, we measured DV/H by asking about specific acts against a partner or peer, such as pushing, kicking, hitting, etc. (or been the victim of these acts). The measures used did not capture intensity, motivations or circumstances surrounding violent acts, nor did the measures distinguish between acts of offense or defense (Wolfe et al. 2009). Also, because of sensitivity concerns raised by school personnel regarding explicit measurement of sexual violence in a middle school population, we were limited to two main items ("pushed, grabbed, shoved, or kicked you in your private parts" and "made you touch their private parts or touched yours when you did not want them to"), similar to other research (Foshee et al. 1998).

We did not ask participants about their sexual orientation, so it is not possible to determine if our findings would be the same for gay and lesbian relationships. We were not able to measure some important covariates (e.g., violence in the home or community) which may have potentially influenced our findings. However, given our use of a randomized experiment these unmeasured variables should have by design been balanced across the treatment and control groups. The broad range of racial/ethnic groups represented in our study stands in comparison to similar DV/H studies limited to mainly White youth (Wolfe et al. 2009) and mainly rural White youth (Foshee et al. 1998). However, our study was also done in the largest U.S. school district (NYC) and our results may only be applicable to similar school districts.

We believe more work is needed to better understand the mechanisms by which the interventions were effective in improving DV/H behavior. We focus on the efficacy of the intervention in this paper. Further work is necessary to examine how the interventions work, and if the components of the TRA are critical mechanisms. Further, phenomenological interviews with students would allow researchers to explore these mechanisms rigorously through highly systematic qualitative methods for inquiry and analysis (Creswell 1998; Patton 1990) and allow the researcher to enter the field of perception of the program participants to elucidate what essential program experiences the students felt caused them to change or not change. In this context, a phenomenological interviewing approach is especially warranted given the dearth of knowledge on what students learn or fail to learn in treatment; what they respond or relate to most about treatment; and non-treatment factors that may lead to change in behaviors.

Conclusions

Our study confirms the importance of working with middle school students on relationship violence. However, given rates

of violence reported by middle school students, our study also suggests that the field may need to work with even younger groups to invoke a true primary prevention effort. While there is a field of research on preventing violence in elementary school ages (Clayton et al. 2001; Wilson et al. 2003), we are not aware of much work being done with elementary school students in the area of the primary prevention of youth dating relationship (or precursors to dating) violence. Since our intervention is designed for middle school students, our material would have to be adapted to be developmentally appropriate for elementary school students or new interventions would have to be designed.

Using an experimental design in NYC middle schools, we have provided scientific evidence that indicates that our building intervention and the combination of our building and classroom interventions can be effective in reducing some forms of youth violence. Practitioners from domestic violence and sexual assault centers consume much of their time and resources in school classrooms focusing on violence, yet they often work with materials and approaches that have not been rigorously evaluated or evaluated at all. Our study helps fill this void of evidence-based guidance and approaches. These results are encouraging and offer support to our contention that these multiple levels of lessons, activities and pedagogy can be effective with students in sixth and seventh grades. As a result of this and prior studies, a body of scientific data is emerging about the beneficial effects of DV/H interventions targeted to middle school students. The success of the building intervention alone is particularly intriguing, in terms of not only its effectiveness but because it can be implemented with very few extra costs to schools. Interventions such as our "building-only" approach are of critical importance to school districts during the current economic climate, a time in which fewer resources are available to address problems such as DV/H. However, the impact of an intervention delivered directly to students in classrooms cannot be dismissed. School districts might consider a scaled approach (growing a program gradually from the building-level to the classroom) if resources are limited. We encourage other researchers and program developers to expand on this study as they pursue efforts to interrupt the precursors to youth dating violence.

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