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Abstract

Evidence suggests that interventions to engage bystanders in violence prevention increase bystander intentions and efficacy to intervene, yet the impact of such programs on violence remains unknown. This study compared rates of violence by type among undergraduate students attending a college campus with the Green Dot bystander intervention ($n = 2,768$) with students at two colleges without bystander programs ($n = 4,258$). Violent victimization rates were significantly ($p < .01$) lower among students attending the campus with Green Dot relative to the two comparison campuses. Violence perpetration rates were lower among males attending the intervention campus. Implications of these results for research and practice are discussed.

Keywords

bystander intervention, college students, dating violence, prevention, sexual harassment, sexual violence, stalking

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Rates of sexual violence (Fisher, Cullen, & Turner, 2000; Kilpatrick et al., 2007) and dating violence (Sabina & Straus, 2008; Smith, White, & Holland, 2003) remain high among college students and have serious consequences for victims (Black et al., 2011; Kilpatrick et al., 2003; Zinzow et al., 2011). Curbing campus crime and its negative tolls, especially the violence that has long plagued women at schools across the country, has been a long-standing interest of Congress. Since the early 1990s, in part promoted by both the advocacy and research communities, the federal government has taken actions to reduce campus violence. The passage of the Crime Awareness and Campus Security Act, later renamed the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act (20 U.S.C. § 1092(f)), Campus Sexual Assault Victims' Bill of Rights (Pub. L. No. 102-325, § 486(c)), and Violence Against Women Act (1994) and its reauthorizations (2000, 2005, 2013), which include Grants to Reduce Domestic Violence, Dating Violence, Sexual Assault, and Stalking on Campus Program, are examples of Congressional efforts to mandate different requirements (e.g., public and timely reporting of sexual offenses and other crime statistics, ensuring basic rights in campus disciplinary procedures, providing comprehensive, coordinated service delivery).

More recently, Congress enacted legislation specifically directed at the programming designed to reduce campus violence. The 2013 Campus Sexual Violence Elimination Act (Campus SaVE; <https://www.govtrack.us/congress/bills/113/s128/text>) requires that primary prevention and awareness campaigns for all incoming students and new employees include bystander intervention training. The 2014 White House Task Force to Protect Students from Sexual Assault support of such training was highlighted when bystander intervention was referred to as "among the most promising prevention strategies". (http://www.whitehouse.gov/sites/default/files/docs/report_0.pdf)

Here we provide a general description of bystander approaches to violence prevention and a review of the current evidence for bystander programs' efficacy. Specific descriptions of the Green Dot bystander program used at the University of Kentucky (UK) are provided next with the study design and methodology explained. This research fills a knowledge gap by providing data to address bystander efficacy as measured by a wide range of interpersonal violence, including both victimization and perpetration across three large college campuses.

Brief Description of Bystander Strategies for Violence Prevention

Bystander strategies engage others in prevention through increasing awareness of the nature and frequency of violence and behaviors to safely and effectively intervene to reduce the risk of violence. Different means to intervene have been described by Banyard, Plante & Moynihan (2005) and Berkowitz (2002) as the Four Ds: direct, distract, delegate, and delay. Direct bystander tactics are stepping into a situation and stopping the violence. Other direct tactics include "speaking up" when someone makes sexist remarks, brags about sexual or physical aggression, or in other ways endorses

support for violent behaviors. Distraction tactics involve diverting the attention of the potential aggressor and removing the potential victim from harm. On college campuses, an effective distraction tactic might be, "Hey, looks like a tow truck has your car!" Delegation tactics usually involve another person and a plan to work together to disrupt the potentially violent situation. One person might directly address the potential aggressor while another engages the potential victim. Delay tactics are those used after violence may have occurred; these also are characterized as reactive tactics and may involve providing support or finding resources for others experiencing violence. Bystander training, then, involves engaging all persons as those who may witness (see or hear) a potentially violent event or are able to respond to a victim and thus prevent the violence or reduce its negative impact.

Evidence of Bystander Program Efficacy

As outlined below, researchers have recently provided evidence that bystander approaches may (a) reduce violence acceptance; (b) increase bystander willingness, efficacy, intentions, and behaviors; and (c) reduce violent victimization and perpetration. These three outcomes are important endpoints for determining efficacy as researchers have hypothesized that behaviorally based interventions may first change one's awareness or ability to recognize violence (Dahlberg, 1998). With training focused on the frequency and impact of violence, changes in individuals' violence acceptance may occur, resulting in less willingness to tolerate violence in one's community. With more specific training on recognizing potentially risky or violent scenarios and skills-building related to tactics for reducing the risk of violence (see above Four Ds), changes in a bystander's willingness to intervene, self-perceived efficacy, intentions, and actual bystander behaviors may also occur.

The majority of published studies examine the effect of participating in bystander programs on rape myth acceptance, with several reporting reductions in Illinois Rape Myth Acceptance scale scores (Ahrens, Rich, & Ullman, 2011; Amar, Sutherland, & Kessler, 2012; Banyard, Moynihan, & Crossman, 2009; Banyard, Moynihan, & Plante, 2007; Coker et al., 2011; Foubert & Masin, 2012; Langhinrichsen-Rohling, Foubert, Brasfield, Hill, & Shelley-Tremblay, 2011). Three additional studies did not find evidence to support a reduction in rape myth acceptance scale scores with participation in bystander training (Gidycz, Orchowski, & Berkowitz, 2011; Miller et al., 2012; Moynihan, Banyard, Arnold, Eckstein, & Stapleton, 2010). Only one study has addressed the efficacy of bystander programs to change dating violence acceptance (Coker et al., 2011). Banyard et al. (2007) provided the first empirical evidence that a bystander intervention for sexual violence prevention resulted in significant and sustained changes in sexual assault bystander efficacy, skills, and intentions. Others now have confirmed this pattern in other college samples (Amar et al., 2012; Banyard et al., 2009; Banyard et al., 2007; Coker et al., 2011; Foubert & Masin, 2012; Gidycz et al., 2011; Langhinrichsen-Rohling et al., 2011; Miller et al., 2012; Moynihan et al., 2010; Potter, Moynihan, Stapleton, & Banyard, 2009; Potter & Stapleton, 2011). An emerging literature also documented the ability of bystander programs to increase

individuals' self-reported use of their own bystander behaviors (Coker et al., 2011; Miller et al., 2012; Potter & Stapleton, 2012), yet not all studies found these positive associations (Banyard et al., 2007; Gidycz et al., 2011).

The Present Research

While it is encouraging that bystander interventions may impact individuals' attitudes and bystander behaviors, these findings will have little meaning if the bystander interventions fail to impact violence rates. The ultimate question, then, is whether bystander interventions can change sexual violence and dating violence rates in the targeted college population using behavioral measures of both victimization and perpetration. In the two bystander evaluation studies that have addressed this question, one study found a reduction in sexually violent perpetration by men (Gidycz et al., 2011), while the other study reported no change in violence rates associated with the intervention (Miller et al., 2012). No published study has as yet examined the effectiveness of bystander programs to reduce interpersonally violent victimization or perpetration rates in both women and men. Because it is not yet known whether increases in bystander behavior will translate into reduced risk of violence, measurement of the intended outcomes, including sexual violence and dating violence, is a critical component of evaluation research in this area (Tharp et al., 2011). The current study addresses this gap in the literature by examining the effect of the Green Dot college-based bystander intervention program on a range of self-reported interpersonally violent behaviors by both victimization and perpetration. In this observational study, students attending the campus with the Green Dot bystander program (intervention campus) are compared with students attending one of two campuses without a bystander program. This college intervention and comparison study adds to the current body of research by including a large sample of students from three college campuses. Prior research has almost exclusively reported outcomes associated with bystander programs with a smaller number of participants within one campus such that the generalizability of such findings may be limited.

Description of the Green Dot Intervention

A range of bystander intervention programs have been developed and implemented in high school and college settings (Banyard et al., 2009; Berkowitz, 2002; Foubert, 2000). Similar to "Bringing in the Bystander" (Banyard et al., 2007), the Green Dot bystander intervention program (www.livethegreendot.com), developed by Dr. Dorothy J. Edwards, former UK's Violence Intervention and Prevention (VIP) Center Director, and implemented in 2007 focuses on bystander training to engage students in actions to reduce sexual violence. The Green Dot curriculum seeks to empower potential bystanders to actively engage their peers in both reactive responses (e.g., helping victims of dating or sexual violence), and proactive responses (e.g., safely but effectively interacting with potentially violent peers and potential victims to reduce violence risk).

Briefly, the Green Dot training included two primary components. First, VIP staff provided 50-min motivational speeches (the *Green Dot speech*) to students in introductory-level college courses and all students in UK101, a one-credit hour course designed to help new students transition to university life. This speech introduced the concept of active bystanding, presented bystander intervention as a manageable and simple activity, motivated students to get involved in prevention, and told students about services and training available at the VIP Center. Second, *intensive Green Dot bystander training* was implemented by VIP staff; the curriculum focused on preventing perpetration behavior by providing students with skills to safely and effectively use bystander behaviors. The intensive bystander training was conducted in groups of 20 to 25 students and took between 4 and 6 hr to complete. While this bystander training was voluntary, open to all students, and advertised campus-wide, the primary means by which students were recruited was through a Peer Opinion Leaders (POLs) strategy. This strategy is based on diffusion of innovation theory (Rogers & Cartano, 1962). The Green Dot program's use of the POL recruitment strategy was to encourage the spread of bystander behaviors from person to person by trained students through their social networks. In this college setting, faculty, staff, students and resident assistants nominated POL students whom they believed were respected influential students. Examples of selected POLs included fraternity or sorority leaders, student body leaders, those involved in varsity sports teams, students earning Deans' honorary academic lists, and leaders of other student activity groups. These students received a letter from the University Provost inviting them to attend bystander training and thanking them for their service to UK.

As described elsewhere (Coker et al., 2011), UK students who received Green Dot intensive bystander training reported using more bystander behaviors than those simply hearing a Green Dot speech, and both intervention groups reported more bystander behaviors than UK students with neither type of training.

The purpose of the current study was to compare the frequency rates of violent victimization and perpetration in three colleges with and without the Green Dot bystander training intervention. The frequency of violence among students attending UK, the campus with the Green Dot bystander intervention (hereafter Intervention), was compared with the frequency of violence in two college campuses without bystander interventions (hereafter Comparison). Analyses were planned to compare violence rates by campus (Hypothesis 1) and by Green Dot training received (Hypothesis 2). The violent victimization and perpetration frequency rates were measured as the number of times the student reported the specific tactic used in the past school year defined as Fall 2009 to late Spring 2010 (response options were "0 times," "1-2 times," "3-5 times," and "6 or more times"; see Table 1 for violent behavior measures).

We posited that if bystander programs increase bystander behaviors, which in turn reduce violence experienced, then the frequency rates of violent victimization and perpetration would be lower among students attending the Intervention campus versus Comparison campuses. Furthermore, training on the Intervention campus would reduce violence rates across the campus even among those not trained, with trained

Table 1. Violence Victimization and Perpetration Measures: Construct, Source, Items, and Psychometric Properties.

	Victimization			Perpetration ^a		
	Loading factor	M	Range ^b	Loading factor	M	Range ^b
Unwanted sex						
Three items load on one factor, separately for victimization (Cronbach's $\alpha = .538$) and perpetration ($\alpha = .752$)		0.306	0-9		0.031	0-9
1. You had unwanted sexual activities because someone threatened to end your relationship if you did not, or you felt pressured by the other person?	.769	0.147	0-3	.761	0.016	0-3
2. Had unwanted sexual activities with someone because you were too drunk or high on drugs to stop them?	.668	0.137	0-3	.888	0.004	0-3
3. Had unwanted sexual activities because the other person threatened to use or used physical force (twisting your arm, holding you down, etc.)?	.723	0.022	0-3	.803	0.011	0-3
Source. Black et al. (2011).						
Sexual harassment and stalking						
Four items each for victimization ($\alpha = .643$) and perpetration ($\alpha = .566$); all load on one factor		2.065	0-12		0.322	0-12
Sexual harassment						
1. Someone made gestures, rude remarks, or use sexual body language to embarrass or upset you?	.723	0.572	0-3	.519	0.151	0-3
2. Someone kept asking you out on a date or asking you to hookup even though you said "No"?	.754	0.447	0-3	.637	0.041	0-3
Source. Fitzgerald, Magley, Drasgow, and Waldo (1999).						
Stalking						
1. Someone showed up where you live, work, or go to school when you did not want them to.	.587	0.314	0-3	.727	0.040	0-3
2. You received unwanted phone calls, gifts, emails, text messages notes, or postings on social networking sites.	.710	0.731	0-3	.740	0.090	0-3
Source. Tjaden & Thoennes (1998).						
Dating violence^c						
Eight items load on two factors (physical and psychological dating violence); $\alpha = .799$ victimization and $\alpha = .807$ perpetration		0.213	0-12		0.156	0-12
Physical dating violence						
1. My Partner pushed or shoved me.	.776	0.127	0-3	.785	0.027	0-3
2. My Partner threw something at me that could hurt.	.632	0.050	0-3	.482	0.100	0-3

(continued)

Table 1. (continued)

	Victimization			Perpetration ^a		
	Loading factor	M	Range ^b	Loading factor	M	Range ^b
3. My Partner punched or beat me up.	.562	0.031	0-3	.733	0.025	0-3
4. My Partner used a knife, gun, or something that could hurt me.	.750	0.005	0-3	.773	0.003	0-3
Psychological dating violence ^c		1.126	0-12		0.786	0-12
1. My Partner shouted, yelled, insulted, or swore at me.	.486	0.647	0-3	.804	0.556	0-3
2. My Partner threatened to hit, throw something at, or otherwise physically hurt me.	.601	0.100	0-3	.573	0.070	0-3
3. My Partner destroyed something that belonged to me on purpose.	.704	0.061	0-3	.595 ^d	0.029	0-3
4. My Partner tried to control me by always checking up on me, telling me who I could be friends with or telling me what I could do and when.	.705	0.323	0-3	.692	0.131	0-3

Source. Straus, Hamby, and Warren (2003; Revised Conflict Tactics Scales).

Note. Total violence: all 15 items: range = 0-45; mean victimization = 3.71 (± 0.05 SE); mean perpetration = 1.30 (± 0.03 SE).

^aQuestion phrasing for perpetration items available on request. Phrasing for represented items is that for victimization.

^bResponse options for all items were never (0 times = 0), 1-2 times (=1), 3-5 times (=2), and 6 or more times (=3).

^cDating violence queried with this introduction: Since fall of 2009, my partner did the following (or I did the following to my partner). Partner was defined as "By partner, we mean any current or former spouse, boyfriend, girlfriend, or dating partner or any person with whom you have ever been romantically or sexually involved." Students not in a dating relationship in the past year were included in the analyses with a frequency of violence of 0 times.

^dPsychological dating violence item loads with physical dating violence.

students reducing the risk of violence among those in the campus community. Because of this diffusion of the intervention effects across a campus community, training may not be directly associated with a reduction in violence rates. Students recruited or opting into Green Dot training may be those with a personal history of violence or some other connection to the issue of interpersonal violence. In addition, Green Dot training may increase students' awareness of more subtle forms of violent victimization and perpetration (such as sexual harassment); these students may then be more likely to recognize and endorse these behaviorally specific items on surveys. Thus, we hypothesized the following:

Hypothesis 1: The frequency of violence victimization and perpetration would be lower among students attending the Intervention campus versus Comparison campuses.

Hypothesis 2: Violence frequency would be lower among those individuals who received the Green Dot training relative to those who did not (on the Intervention and Comparison campuses).

Method

Study Design

The current study utilizes an observational comparative design in which surveyed students attending the Intervention campus were compared with students attending two campuses without a bystander program. Identical online survey methods were utilized on all three campuses and data were collected during the 2010 Spring term. The comparison college campuses were selected based on having (a) no currently implemented bystander intervention program, (b) similar campus size and demographic comparability to UK, and (c) faculty willing to be research collaborators. The two comparison campuses were the University of Cincinnati (UC) and the University of South Carolina (USC).

Sampling and data collection. On each of the three campuses, a stratified random sample of currently enrolled undergraduate students aged 18 to 24 was obtained using the registrar's data for the Spring 2010 term. Stratum selection was based on year in school with 25% from each class (freshman, sophomore, junior, and senior), and within each class half of the sample were female. At each comparison, campus approximately 4,000 students were randomly sampled per school; at the intervention campus approximately 8,000 students were sampled.

In April 2010, a letter describing the purpose of the study was sent to all sampled students' local mailing addresses. This letter provided an introduction to the study and US\$2 cash was included as an incentive. Two days later, students were invited, via their university-assigned email address, to participate in the online survey. Students could opt out by clicking a link in the email, or emailing or calling study staff if they did not wish to participate (refusals). Reminder emails were sent approximately every 3 days for the following 2 weeks. Students were instructed to click on the online survey link, read the study description and informed consent and decide if they wished to participate in the study. The institutional review board at each campus approved the respective research protocols; a waiver of written consent was granted. We obtained a certificate of confidentiality from the National Institutes of Health for this project because questions regarding physical and unwanted sex were asked and some students were underage (<21 years old). At the end of the survey, local sexual violence and dating violence referral resources for each campus, and websites and toll-free phone numbers for service providers, were provided to all participants.

Assessing Intervention Exposure

Exposure to the Green Dot intervention was measured in two ways. First and corresponding with Hypothesis 1, intervention exposure was measured by attendance at the Intervention or Comparison campuses. Students attending the Intervention campus ($n = 2,768$) were considered Green Dot intervention exposed, while students attending the two comparison campuses without a bystander intervention ($n = 4,258$) were categorized as unexposed (see Table 4). Second, corresponding with Hypothesis 2,

intervention exposure was defined based on a student's self-reported participation in Green Dot training (i.e., Green Dot speech and/or intensive bystander training). Among the 2,768 UK students measured as Exposed, 1,570 (57% of all surveyed UK students) received some form of Green Dot training; 448 reported receiving intensive Green Dot bystander training (16% of all UK students surveyed) and 1,122 received Green Dot speeches but no intensive bystander training (41% of all UK students surveyed). The comparison group for this analysis included 5,456 students reporting no Green Dot training independent of the college they attended; 4,258 attended one of the comparison campuses; and 1,198 attended UK but did not report receiving any Green Dot training.

Measures

Violent victimization and perpetration measurement. Participants were asked to report their own experiences with violent victimization and perpetration since the start of the academic year in the fall 2009 term (approximately 9 months). As shown in Table 1, students were asked how frequently they had experienced any of the four types of violence as a victim or perpetrator: (a) unwanted or forced sex, (b) sexual harassment, (c) stalking, and (d) physical and psychological dating violence. We adapted widely used violence measures (unwanted sex from the National Intimate Partner and Sexual Violence Survey, Black et al., 2011; sexual harassment from Sexual Experiences Questionnaire, Fitzgerald, Magley, Drasgow, & Waldo, 1999; stalking from National Violence Against Women Survey, Tjaden & Thoennes, 1998; dating violence from the Revised Conflicts Tactic Scales, Straus, Hamby, & Warren, 2003), yet reduced the specific items to allow a brief assessment of a wide range of violence victimization and perpetration. To create a frequency measure for each type of violence and by victimization and perpetration, the responses were summed. Factor analyses with varimax rotation indicated all items within each form of violence, conducted separately by victimization and perpetration, loaded on one factor with the following exceptions. The four items measuring sexual harassment and stalking loaded as one factor (separately by victimization and perpetration). Therefore, sexual harassment and stalking behaviors were grouped together. Finally, the following item assessing psychological dating violence perpetration loaded with physical rather than other psychological dating violence perpetration items: "I destroyed something that belonged to my partner on purpose." For dating violence victimization, the item, "My partner destroyed something that belonged to me on purpose" loaded with the psychological violence items. Table 1 provides the constructs and their source, the items, their response options, and the psychometric profile of the measures.

Demographic Attributes of Students Across College Campuses

Campus-specific demographic and crime data were used to evaluate the comparability of the three campuses (see Table 2). Students were directly asked their sex, age, year in school (freshman-senior), race/ethnicity, membership in a fraternity or sorority,

Table 2. Demographic Characteristics and Crime Rate by Type for the Intervention and Comparison Campuses.

Population (n)	Intervention campus	Comparison campuses	Comparison campuses vs. Intervention		
	n = 28,034	n = 64,635	χ^2	df	p value (two-tailed)
% female	50.4%	52.5%	32.98	1	<.00001
% non-White	20.6%	22.5%	40.59	1	<.00001
Violent crime	Crime rates per 1,000 students ^a				
Forcible sexual offense	0.24	0.38	0.86	1	ns
Robbery	0.25	0.26	0.01	1	ns
Aggravated assault	0.32	0.43	0.62	1	ns
Burglary	2.02	2.28	0.52	1	ns
Arrests					
Weapons violation	0.24	0.18	0.39	1	ns
Drugs possession	4.29	3.24	6.06	1	.01
Liquor law violation	0.56	1.40	11.88	1	.0006

Source. The Campus Safety and Security Data Analysis Cutting Tool <http://www.ope.ed.gov/security/>.

^aCrime rates for 2010-2012 averaged across the 3 years (and weighted by the number of students enrolled at the two comparison universities).

sexual attraction (dichotomized for analyses as exclusively attracted to the opposite sex or not), their parents' highest educational attainment, and their current dating or relationships status (see categorization on Table 3).

Statistical Analysis

Data were analyzed using Statistical Analysis Software (SAS), version 9.3 (SAS Institute; Cary, North Carolina). To evaluate comparability of the three campuses, college-level differences in demographic attributes and crime statistics required by the Clery Act (Table 2) were determined using test of proportions (chi-square) or means (*t* tests for independent samples). To determine differences among those completing the survey by Intervention versus Comparison sites, a wider range of individual socio-demographic attributes were compared (Table 3) using test of proportions (chi-square). Subsequent multivariate comparisons were adjusted for identified demographic differences (e.g., sex, class [year in school], fraternity/sorority membership, race/ethnicity, highest parental education, sexual attraction, and current relationship status).

To address Hypothesis 1 (violence would be lower among students attending the Intervention vs. Comparison campuses), rates of violence among UK students were compared with Comparison campuses. Because a range of violent behaviors are included and victimization and perpetration are correlated, MANCOVAs were conducted. Two sets of MANCOVA models were estimated with the following measures: (a) total frequency combination all forms of violent behaviors separately for victimization and perpetration ($n = 2$; Wilks's Lambda = 0.997; F value = 8.84 $df = 2$; Density $df = 7016$; $p = .0001$), and (b) separately for each of the forms of violent victimization and perpetration ($n = 8$; Wilks's Lambda = 0.993; F value = 5.70 $df = 8$; Density

Table 3. Demographic Characteristics of Surveyed Students in the Intervention (Green Dot Exposed) and Comparison Campuses.

Demographic characteristics	Intervention (n = 2,768)	Comparison (n = 4,258)	χ^2	df	p value
	n (%)	n (%)			
% female	1,690 (61.1)	2,443 (57.4)	9.38	1	.002
Class			31.98	3	<.0001
Freshman	813 (29.4)	1,212 (28.5)			
Sophomore	738 (26.7)	1,078 (25.3)			
Junior	547 (19.7)	1,077 (25.3)			
Senior	670 (24.2)	891 (20.9)			
% non-White race/ethnicity	403 (14.6)	841 (19.8)	31.03	1	<.0001
% fraternity/sorority	525 (19.0)	685 (16.1)	9.75	1	.002
Sexual attraction: % not exclusively attracted to the opposite sex	311 (11.2)	540 (12.7)	3.30	1	.07
Parental education			23.46	3	<.0001
≤high school graduate/orGeneral Educational Development (GED)	380 (13.7)	520 (12.2)			
Some college or vocational school	681 (24.6)	905 (21.3)			
College graduate	846 (30.6)	1,511 (35.4)			
Post-graduate or professional training	861 (31.1)	1,322 (31.1)			
Current relationship status			16.62	3	.001
Never dated or not currently dating	811 (29.3)	1,276 (30.0)			
Go out on dates but not currently in a relationship	451 (16.3)	744 (17.5)			
Currently in a relationship but not living together	1,280 (46.2)	1,994 (46.8)			
Living together or married	226 (8.2)	244 (5.7)			

$df = 7010$; $p < .0001$; note that psychological and physical dating violence were included as separate forms of violence, and sexual harassment and stalking were summed as one measure). Finding a statistically significant F value associated with the Wilks's Lambda indicates that outcomes were correlated and MANCOVA was appropriate.

To test Hypothesis 2 (similar violence rates by training), MANCOVA was again used with training defined as students' self report of participation in Green Dot intensive bystander training, attending a speech, or receiving no training. Because Green Dot training may have a different impact among males and females, analyses were additionally stratified by sex. Given multiple comparisons, we used a p values $\leq .01$ to indicate statistical significance.

Results

Across the three campuses, 15,540 students, aged 18 to 24, were invited to complete the online survey (7,470 on the intervention campus; 7,970 on the comparison campuses). Of these students, 8,192 (53%) visited the online survey website and 7,341 completed at least the violent victimization and perpetration items of the survey (89.6% of those visiting the online survey site; 47.5% of those invited to participate).

Data from 4.3% (315/7,341) of respondents were excluded due to missing or incomplete data on items assessing demographic attributes ($n = 308$) or violence intervention training ($n = 7$), leaving a final sample of 7,026 respondents included in the analyses. The final sample represented 45.5% of the 15,440 invited students (37.0% on the Intervention campus and 52.6% on Comparison campuses).

Similarities between the entire student body from the Intervention and Comparison campuses were assessed using available demographic and crime statistics (www.ope.ed.gov/security/); the Intervention campus was the referent group (Table 2). There were no differences in violent crime rates by campus, but arrests for drug possession were higher ($p = .01$) on the Intervention campuses, and arrests for liquor law violations were higher on the Comparison campuses.

To determine the comparability of our sample with the full sample from which random samples were drawn by college, we compared the demographic data available for the Intervention and Comparison campuses (see Table 2). Among the sample of 7,026 completing the survey, 58.9% were female, 28.9% were freshman, and 17.8% were non-White race. The proportion of females attending any of the three colleges was 51.9%, 21.9% were non-White race, and 25% were freshman based on our sampling. Thus, in our responding sample relative to the student body on the three campuses, females, freshmen and White students were over-represented ($p < .001$ for each comparison).

Next, we compared the demographic characteristics of students attending the Intervention versus Comparison campuses (Table 3); those attending the intervention campus were more likely to be female, seniors, White race, in a fraternity or sorority, have lower parental education, and live together or are married. Because we sampled undergraduates ages 18 to 24, we anticipated and found no differences in mean age ($t = 0.20$ $p = ns$) by campus (not shown in Table 3).

In Table 4, the results for the evaluation of the Green Dot intervention at the campus level (Intervention vs. Comparison campuses) was presented for the four forms of interpersonal violence for all students and by sex. Given noted differences between the student demographics at the campus level (Table 2) and those of students completing the surveys by Intervention or Comparison campuses (Table 3), we adjusted all analyses for sex, race, year in college, parental education, fraternity or sorority membership, sexual attraction and current relationship status (Tables 4 and 5). Two sets of MANCOVA models were used: (a) All four forms of interpersonal violence were included separately for victimization and perpetration, and (b) the total frequency measure summing the four forms of violence separately by victimization. As hypothesized, adjusted least square mean violent victimization frequency rates were lower in the Intervention than Comparison campuses. Differences were significantly lower ($p \leq .01$) for sexual harassment and stalking victimization (11% lower) and perpetration (19% lower), and total violent victimization (9% lower). The modest difference in unwanted sex victimization observed among all students ($p = .03$) was not significant at the $p < .01$ level. However, when looking specifically at the unwanted sex items, adjusted least square means were 17.2% lower ($p = .01$) on the Intervention (0.168)

Table 4. Evaluation of Green Dot Comparing Intervention and Comparison Campuses With Violent Victimization and Perpetration Frequency as Outcomes (MANCOVA).

Violence frequency	Direction of behavior	Among ^a	Adjusted ^b least square means (SE) by intervention campus		Mean difference between intervention and comparison campuses	t statistic	p value
			Intervention (n = 2,768)	Comparison (n = 4,258)			
Unwanted sex	Victimization	All students	0.38 (.02)	0.42 (.02)	-.04	-2.22	.03 ^c
		Males	0.28 (.03)	0.32 (.03)	-.04	-1.69	ns
		Females	0.48 (.03)	0.52 (.03)	-.04	-1.59	ns
	Perpetration	All students	0.07 (.01)	0.08 (.01)	-.01	0.90	ns
		Males	0.11 (.02)	0.13 (.02)	-.02	-1.09	ns
		Females	0.04 (.01)	0.04 (.01)	.00	-0.11	ns
Sexual harassment and stalking	Victimization	All students	2.26 (.06)	2.53 (.05)	-.27	-5.14	<.0001
		Males	1.67 (.08)	1.97 (.07)	-.30	-4.57	<.0001
		Females	2.89 (.08)	3.13 (.08)	-.24	-3.21	.001
	Perpetration	All students	0.38 (.02)	0.47 (.01)	-.09	4.33	<.0001
		Males	0.44 (.05)	0.62 (.04)	-.18	-4.58	<.0001
		Females	0.31 (.03)	0.34 (.02)	-.03	-1.35	ns
Physical dating violence	Victimization	All students	0.28 (.02)	0.29 (.02)	-.01	-0.25	ns
		Males	0.34 (.04)	0.39 (.04)	-.05	-1.54	ns
		Females	0.24 (.03)	0.22 (.02)	.02	1.18	ns
	Perpetration	All students	0.24 (.02)	0.24 (.02)	.00	0.05	ns
		Males	0.17 (.03)	0.19 (.02)	-.02	-0.75	ns
		Females	0.30 (.03)	0.29 (.02)	.01	0.50	ns

(continued)

Table 4. (continued)

Violence frequency	Direction of behavior	Among ^a	Adjusted ^b least square means (SE) by intervention campus		Mean difference between intervention and comparison campuses	t statistic	p value
			Intervention (n = 2,768)	Comparison (n = 4,258)			
Psychological dating violence	Victimization	All students	1.20 (.05)	1.29 (.05)	-.09	-2.05	.04
		Males	1.10 (.08)	1.27 (.07)	-.17	-2.73	.006
		Females	1.30 (.07)	1.33 (.06)	-.03	-0.53	ns
	Perpetration	All students	0.93 (.04)	0.92 (.03)	.01	0.11	ns
		Males	0.17 (.03)	0.19 (.02)	-.02	-0.66	ns
		Females	1.09 (.05)	1.06 (.05)	.03	0.61	ns
Total: All forms of violence	Victimization	All students	4.12 (.11)	4.53 (.10)	-.41	-4.15	<.0001
		Males	3.40 (.17)	3.96 (.15)	-.56	-4.23	<.0001
		Females	4.92 (.15)	5.20 (.14)	-.28	-2.12	.03
	Perpetration	All students	1.62 (.07)	1.72 (.06)	-.10	-1.59	.11
		Males	1.43 (.11)	1.67 (.10)	-.24	-2.63	.0009
		Females	1.74 (.09)	1.73 (.08)	.01	0.11	ns

Note. $p \leq .01$ denotes statistical significance given multiple comparisons.

^aAmong all students $N = 7,026$; among males $n = 2,893$, among females $n = 4,133$.

^bAdjusted for class, sex, race, parental education, current relationship status, sexual attraction, and fraternity/sorority membership.

^cNote that the modest effect of intervention on unwanted sex ($p = .03$) was due to "Had unwanted sexual activities with someone because you were too drunk or high on drugs to stop them?" (Item 2 on Table 1) among women (victimization; adjusted least square mean: Intervention = 0.168 vs. Comparison = 0.203; t test = -2.58; $p = .01$).

Table 5. Evaluation of Green Dot Comparing Training Received (Intensive Bystander, Speeches Alone, No Training) and Violent Victimization and Perpetration Frequency as Outcomes (MANCOVA).

Direction of violent behavior		Analyses by green dot training received					
		Adjusted ^a least square means (SE) [t test <i>p</i> value]					
		Intensive bystander (n = 448)		Speeches alone (n = 1,122)		No training (n = 5,456)	
Among all students	Victimization	3.98 (.20)	[-2.44 ^{.01}]	4.22 (.15)	[-2.01 ^{.04}]	4.48 (.10)	[REF]
	Perpetration	1.65 (.12)	[-.39 ^{ns}]	1.60 (.09)	[-1.30 ^{ns}]	1.70 (.06)	[REF]
		(n = 122)		(n = 385)		(n = 2,386)	
Among males	Victimization	3.71 (.33)	[-.14 ^{ns}]	3.80 (.22)	[0.24 ^{ns}]	3.76 (.15)	[REF]
	Perpetration	1.69 (.22)	[.51 ^{ns}]	1.52 (.15)	[-0.46 ^{ns}]	1.58 (.10)	[REF]
		(n = 326)		(n = 737)		(n = 3,070)	
Among females	Victimization	4.56 (.26)	[-2.67 ^{.008}]	4.82 (.19)	[-2.53 ^{.01}]	5.27 (.14)	[REF]
	Perpetration	1.66 (.14)	[-0.72 ^{ns}]	1.65 (.11)	[-1.25 ^{ns}]	1.77 (.08)	[REF]

Note. *p* ≤ .01 denotes statistical significance given multiple comparisons.

^aAdjusted for class, sex, race, parental education, current relationship status, sexual attraction, and fraternity/sorority membership.

than the Comparison campuses (0.203) for having “unwanted sexual activities with someone because you were too drunk or high on drugs to stop them” (Item 2, Table 1).

Differences in violence frequency rates between the Intervention and Comparison campuses were more pronounced for males than females. The lower total violence frequency rates for both victimization and perpetration on the Intervention relative to Comparison campuses were significant among males, but not among females. The lower rate of sexual harassment and stalking perpetration on the Intervention relative to Comparison campuses was statistically significant among males, but not among females. Finally, the percent difference in adjusted least square means for sexual harassment and stalking victimization comparing the Intervention and Comparison campuses was 15.3% lower in males and 9% lower in females.

To test the second hypothesis positing lower total violent victimization and perpetration frequency rates among trained versus non-trained students, we first compared the demographic attributes of those receiving Green Dot training (intensive bystander training: *n* = 448; or Green Dot speeches alone: *n* = 1,122) relative to those not receiving training (*n* = 5,456). A higher proportion (*p* < .0001) of females received intensive bystander training (72.7%) and Green Dot speeches alone (65.7%) relative to untrained students (56.4%; *p* < .0001). Similarly, students in fraternities or sororities were over-represented in the intensive bystander trained group (62.9%; *p* < .0001) relative to both the Green Dot speech alone (15.3%) and untrained students (14.0%). This finding was anticipated as both fraternities and sororities were targets of training as POLs. Seniors were under-represented in the trained groups and represented 17.8% of those receiving intensive bystander training, 20.1% of the Green Dot speech alone group, and 23.1% of non-trained students. There were no differences by training in race/ethnicity, relationship status, sexual attraction, or parental education level.

We used the same analysis strategy (MANCOVA) to compare total violence frequency rates by training received among all students and again by sex. Wilks’s Lambdas

for the MANCOVA models were significant ($p < .001$), indicating that the total violence frequency measures (victimization and perpetration) were correlated and that MANCOVA was appropriate. No significant differences in the total violence perpetration rates were noted by training received for all students or by sex. Receiving Green Dot speeches alone relative to no Green Dot was not associated with differences in total violent victimization or perpetration rates for all students or by sex. A 13% lower total violent victimization rate was observed among those receiving intensive bystander Green Dot training relative to no Green Dot training ($p = .01$) and this pattern held among females ($p = .008$) alone. Finally, females who received the Green Dot speech alone had a lower violent victimization rate than females who were not trained ($p = .01$).

Discussion

Green Dot is similar to existing bystander interventions, which (a) candidly present the risk of violence, the consequences of violence to the victim, family, and friends; (b) train students to identify situations that may potentially increase risk of dating violence or sexual violence; and (c) empower students to do what they can to safely and effectively address the situation by themselves or with others. Green Dot differs from other programs with regard to how students are selected for the bystander training. The theorized proportion of the population needing to be trained to see whether that training is diffused through a community is 15% (Rogers & Cartano, 1962); based on our survey sample of UK students, 16.5% reported having received intensive Green Dot bystander training. This indicated that VIP met the theoretical threshold to begin to see diffusion of the intervention and associated impact on violence outcomes. Similarly, 58% of UK students surveyed reported having received Green Dot training (hearing a speech or intensive bystander training). This Green Dot training coverage at UK suggests that this program was widely implemented.

The current study found that the campus implementing Green Dot had lower rates of violence victimization and perpetration when compared with two college campuses without bystander intervention training. The lower rates were primarily a function of lower sexual harassment and stalking victimization and perpetration. Similar findings were observed when comparing data from students who reported receiving Green Dot training compared with those not receiving it. These findings suggest that Green Dot training may have effects at the community level (e.g., among students attending a college with Green Dot) as well as a more specific effect on the students who actually received Green Dot training. When comparing the Intervention and Comparison campuses, lower stalking and sexual harassment victimization rates were found for both females and males, but lower perpetration of these behaviors was found only for males. Overall, these findings suggest that Green Dot was associated with lower rates of violence among students on the campus with this diffusion-based program; this finding provides support for the program's effectiveness in preventing violence. Furthermore, because bystander behaviors are targeted toward reducing perpetration of violence, particularly among men, finding a reduction in violence perpetration among men is also suggestive of Green Dot efficacy. Notably, we observed lower rates

of stalking and sexual harassment, but not unwanted sex (with a noted pattern of lower unwanted sexual activities “because you were too drunk or high on drugs to stop them” victimization among females) and dating violence. This may be a function of limited study power as unwanted sex and physical dating violence victimization and especially perpetration were less frequently endorsed items.

When comparing those receiving Green Dot training with non-trained students across the three colleges, lower violent victimization rates (primarily stalking and sexual harassment) were found among females, but not males. We hypothesized that bystander training may impact the trained individual’s risk of subsequent violent victimization because the training focuses on changing the student’s ability to proactively identify and avoid risky situations, to create safer environments through the student’s social networks, and to intervene when risky situations arise. Our finding of lower violent victimization rates among intensive bystander trained females versus males may be explained by the larger proportion of women trained (of 2,768 surveyed intervention students, 11.8% were trained women ($n = 326$) and 4.4% were trained men ($n = 122$)) and greater overall risk of interpersonal violence for college women. In addition, the efficacy of training may be greater for females than males because young women may more accurately perceive themselves to be at risk of sexual violence or dating violence and, therefore, see the value of training and may more rapidly incorporate the training messages to reduce their own risk by avoiding risky situations or effectively safety planning.

Limitations

Although this study provides a look at the potential behavioral outcomes associated with this bystander intervention with a large sample at three campuses, the observational study design represents a significant limitation. Campuses were not randomized to receive the intervention for two important reasons. The Green Dot bystander intervention began in 2007 and our measurement team was not in place until 2009-2010. In addition, the nature of the Green Dot bystander program makes randomization difficult. This program was designed to engage students through their peer networks. Randomization would be voided as soon as students brought their training into their residence halls, classrooms, and other social communities. Without randomization to condition or assessment of baseline equivalency, it is possible that other characteristics between the campuses, rather than implementation of the intervention, explain the differences in violence rates. To account in part for observed differences, we controlled for demographic and risk behavior differences in the analyses. In addition, we conducted analyses comparing students at Intervention and Comparison campuses as well as comparing Green Dot trained and untrained students. While randomization of specific universities was not feasible for this study, it is strongly recommended for future research. An additional longitudinal study of students followed over time by university and by training received would provide better data to determine the temporal sequence of training received, changes in bystander efficacy, bystander behaviors, and violent victimization and perpetration.

The well-recognized limitation of respondent self-selection may have introduced selection bias. However, our response rates (89.6% of those visiting the online survey site and 47.5% of those invited) are good given students' use of their campus mail and email addresses. In an earlier study, we found that students who completed the survey were more likely to be female, freshmen and members of a fraternity or sorority (Coker et al., 2011); individuals with these demographic characteristics may be more likely to respond to the survey as they see the issues addressed by the survey as more personally relevant. While we did observe associations between the intervention and the more commonly occurring forms of violence (i.e., sexual harassment and stalking), this study may have been underpowered to detect forms of severe physical dating violence or physical forced sex.

Several study strengths deserve mention. This evaluation included a large number of students randomly sampled from each of the three campuses with equal proportions of students sampled by gender and class. Use of the same methodology across all three campuses reduced the possibility of differential selection and misclassification biases. To assess the bystander intervention program's potential effect on violence, we measured a range of violence types, including both victimization and perpetration. This broadened definition of violence victimization and perpetration provided a more comprehensive measure of potential intervention efficacy.

We found that attending a college with the Green Dot program was associated with lower violent victimization for both genders, and lower perpetration among males. Participation in Green Dot training was associated with lower violence victimization among women. Although more rigorous research is needed, this study provides initial support for Green Dot bystander training efficacy given the observed association with lower rates of violent victimization and perpetration on the campus with Green Dot relative to two campuses without this training. These findings have direct relevance in light of the Campus SaVE Act requirement for implementation of primary prevention interventions, including bystander training programs, on college campuses (<http://www.govtrack.us/congress/bills/113/s128/text>). Our findings also are encouraging in that Green Dot was associated with lower rates of violent victimization and perpetration among males, a group historically less likely to engage in violence prevention efforts. Furthermore, our finding of lower sexual harassment and stalking victimization frequency among those receiving Green Dot training compared with those not trained suggests that the training itself impacts violence, particularly among women, who are at higher risk of victimization. Green Dot may impact violence rates by training students to see their own role and responsibility within their social network to proactively create safety plans, to speak up when they hear about or see situations that make them concerned about their own or another's safety (including sexually offensive or harassing language), and to consider avoiding risky settings or behaviors. Because Green Dot uses a POL modality to rapidly diffuse the intensive bystander training throughout a college campus, this approach can be more cost-effective as fewer students need to be trained (15% of the campus).

Conclusion

The current study provides an evaluation of the potential impact of a bystander training program on reducing violence for both male and female college students. These findings point to the need for additional research that can provide more definitive conclusions regarding the effects of Green Dot and other bystander prevention strategies on rates of violent behavior among college students. These data are encouraging of bystander-based interventions on college campuses to effectively reduce interpersonal violence among college students.

Declaration of Conflicting Interests

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