

Challenge and Opportunity in Evaluating a Diffusion-Based Active Bystanding Prevention Program: Green Dot in High Schools

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Abstract

Increasing attention has recently been paid to the development of prevention programs designed to actively engage bystanders in prevention efforts to reduce the risk of sexual and dating violence; yet, few evaluations have been conducted. Our proposed plan to rigorously evaluate a randomized intervention trial of the *Green Dot* bystander program as it is implemented in high schools across Kentucky is presented. We highlight the value of measuring violence victimization and perpetration outcomes, capturing actual and observed student bystander behaviors, and testing the diffusion of Green Dot training through students' social networks.

Keywords

bystander behaviors, dating violence, sexual violence, violence prevention

Understanding how to reduce rates of sexual violence is a problem that continues to elude researchers and practitioners in the field. In response to high rates of sexual violence among young women and particularly those attending college, Congress

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passed several acts throughout the 1990s directed at addressing sexual assault on campuses, including the *Student Right-to-Know and Campus Security Act of 1990*, 20 U.S.C §1092[f], renamed in 1998 the *Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act*. This legislation requires, among other things, college campuses receiving Title IV funding to disclose their policy on sexual assault and describe the educational programs provided by the college to promote awareness of rape and other sex offenses. This act enabled development of programs to increase sexual violence awareness and promoted risk reduction activities across college campuses. Unfortunately, these programs have shown little effect on reducing rates or preventing sexual violence (Gidycz et al., 2001; Gidycz, Rich, Orchowski, King, & Miller, 2009).

At the same time, there has been a growing recognition that college women are not the only group at risk of sexual and dating violence and in need of prevention programming. Female and male adolescents are at risk of sexual and dating violence prior to entering college; by age 17, more than 9.5% of high school students have been forced to have sexual intercourse (Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009; U.S. Department of Health and Human Services, Centers for Disease Control and Prevention [CDC], 2012), and 9.4% disclosed physical dating violence in the past 12 months (U.S. Department of Health and Human Services, CDC, 2012). Although middle and high school students are at increased risk of both dating and sexual violence, only two programs have documented efficacy in reducing dating and sexual violence: *SAFE Dates* (Foshee et al., 1998; Foshee et al., 2000) and *The Fourth R: Skills for Youth Relationships* (Wolfe et al., 2009).

The Bystander Approach to Sexual Violence Prevention

With little evidence to suggest that awareness and risk reduction strategies have been effective in decreasing the rate of violence (Lonsway et al., 2009; O'Leary, Woodin, & Fritz, 2005), a novel bystander approach to violence prevention programming emerged (Banyard, Moynihan, & Crossman, 2009; Banyard, Moynihan, & Plante, 2007; Banyard, Plante, & Moynihan, 2005; Berkowitz, 2002; Burn, 2009; Chekroun & Brauer, 2002; DeKeseredy, Schwartz, & Alvi, 2000; Katz, 1994). One of the earlier bystander programs was Mentors in Violence Prevention (MVP), a nationally recognized education program utilizing student-athletes and leaders to focus attention on issues of gender violence, bullying, and school violence (Katz, 1994). The MVP first trained college-aged student-athletes and was then applied to leaders among the high school population. Banyard et al. (2005) were the first to propose bystander interventions aimed at the reduction of sexual violence with their program, *Bringing in the Bystander*.

A Review of Bystander Intervention Evaluations

A review of the literature describing evaluation of bystander intervention programs suggests that the majority of evaluations had relatively small numbers of participants,

were conducted over short time frames, and had a limited number of different settings (see Table 1). The most common evaluation used was a pre–post test design, which measures change in respondents' attitudes toward violence acceptance and willingness to engage others in active bystanding to reduce the risk of violence. Less common are evaluations that measure actual behavior changes such as increased willingness to engage in active bystanding.

As presented in Table 1, MVP provided early data showing that a bystander intervention program could be effective in changing attitudes about creating social change around the broader problem of gender violence (Cissner, 2009; Ward, 1999). Banyard et al. (2007) provided the first empirical evidence that a bystander intervention for sexual violence prevention resulted in significant and sustained changes, not only in knowledge and attitudes but also in bystander behaviors in both men and women. This research was a key step forward in the evaluation of engaging bystanders to prevent violence. By not only measuring changes in attitudes but also behavior changes resulting in increased bystanding, Banyard and colleagues (2007) evaluated actual behavior change as a necessary outcome and began building an evidence base of what works in engaging bystanders to prevent sexual and dating violence. Much evaluative research is ongoing for this productive team.

The Green Dot Bystander Prevention Program

Early development in the college setting. The *Green Dot* program was first developed in 2006 at the University of Kentucky by Dr. Dorothy Edwards (www.livethegreendot.com) as an innovative application of the bystander paradigm to dating and sexual violence prevention in a college setting. This program was built on a synthesis of literature examining what inhibited bystanders from intervening (Bryan & Test, 1967; Chekroun & Brauer, 2002; Clark & Word, 1974; Darley & Latané, 1968; Goldman & Harlow, 1993; Latané & Darley, 1970; Rushton & Campbell, 1977) and contextual factors in college communities.

Green Dot seeks to train individuals as potential bystanders to effectively and safely identify potentially violent situations and effectively intervene to prevent violence. The training seeks to build new social norms through diffusion of bystander action through peer groups. Green Dot addresses all types of partner and sexual violence with the focus on interpersonal relationships, because those with the greater power differential in a relationship have historically been “allowed” through social norms to use aggression or control to maintain this differential, be the victims male or female. Green Dot teaches students to engage each other and to keep each other safe through confronting social norms and individual actions that make violence possible. Although many men and women are not violent, Green Dot raises consciousness regarding all persons' responsibility to identify and engage each other to reduce violence. Specifically, “bystander intervention” is a community-based strategy designed to change the context or environment that may tacitly support the use of violence. Enlisting all members of a community to be willing and able to respond to risky or dangerous situations in terms of partner violence and sexual violence is expected to

Table 1. Overview of Methodologies of Existing Studies of Bystander Violence Prevention Programs.

Program	Authors (year)	Setting	Sample	Methodology	Outcomes tested	Findings
All-Male Rape Prevention Peer Education Program	Foubert and McEwan (1998)	College	155 male fraternity members from one college campus	Pre-test/post-test experimental design	Rape myth acceptance Central route processing Behavioral intent to rape	Significant decrease in rape myth acceptance Decline in behavioral intent to rape from pre-post test with program participants but not significantly different from control group Central route processing was correlated with lower scores on rape myth acceptance and behavioral intent to rape No significant difference in posttest rape myth acceptance scores between program participants who did and did not receive questions at pretest. Program participants had significantly lower scores on sexist attitudes at posttest compared with pretest Program participants had significantly lower scores on sexist attitudes than non-participants at posttest
Mentors in Violence Prevention	Cisner (2009)	College	820 fraternity and sorority members from one college campus	Quasi-experimental pre-test/post-test design	Sexist attitudes Appraisal of peer sexist attitudes Sense of self-efficacy	Program participants had significantly higher self-efficacy scores at posttest compared to pretest Program participants had significantly higher self-efficacy scores than non-participants at posttest Workshop participants attributed less sexist attitudes to their peers post training while peer educators had no significant difference. Program participants had statistically significant higher correct scores on 4 of 5 questions pertaining to knowledge of gender violence Program participants had a statistically significant decrease in attitudes accepting of violence as measured on the AV scale Program participants had a statistically significant increase in student efficacy to confront and prevent sexual violence as measured on the SEV scale
	Ward (1999)	High school	209 students from 12 groups at 10 sites for pre/post test; 2 sites for case study	Mixed method design with pre-test/post-test surveys and case study	Knowledge change Attitudes regarding gender violence Self-efficacy Student satisfaction	

(continued)

Table 1. (continued)

Program	Authors (year)	Setting	Sample	Methodology	Outcomes tested	Findings
Bringing in the Bystander	Moynihan, Banyard, Arnold, Eckstein, and Stapleton (2011) Moynihan et al. (2011)	College	56 sorority members from one college campus	Pre-test/post-test experimental design	Bystander efficacy Intent to help Responsibility to help	Increased bystander efficacy Increased likelihood to help Increased responsibility for ending violence No significant backlash effects
		College	139 male and female athletes from multiple colleges	Pre-test/post-test, 2-month follow-up survey, experimental design.	Rape myth acceptance Intent to engage in bystander behaviors Bystander confidence Bystander behaviors	Program worked overall for women and men. Improved bystander confidence Improved intent to engage in bystander behaviors No significant backlash effects
	Banyard, Moynihan, and Plante (2007)	College	389 under-graduate students	Pretest/posttest 2-, 4-, 12-month follow-up experimental design with 2 intervention conditions	Knowledge assessment Attitudes toward rape Rape myth acceptance Attitudes toward bystanding Bystander behaviors Bystander efficacy Decision balance	In both a one session and three session program, participants showed an increase in knowledge, decrease in rape myth acceptance as measured on the Illinois Rape Myth Acceptance Scale and the Date Rape Myth Scale at posttest and 2 month post intervention. In both intervention conditions, participants show an increase in intent to bystand as measured by the Bystander Attitudes Scale and increase in completing bystander behaviors.
Green Dot	Coker et al. (2011)	College	7,945 randomly selected under-graduate students	Cross sectional survey	Green Dot intervention exposure Rape myth acceptance Acceptance of dating violence Observed bystander behaviors Active bystander behaviors	Student who were trained had significantly lower rape myth acceptance scores as measured by the Illinois Rape Myth Acceptance Scale and the Dating Violence Acceptance Scale Students who received one of three types of exposure to the intervention reported more observed and active bystander behaviors than students who were not exposed to the intervention

promote an environment in which all members feel responsibility for and willingness to intervene to help other members. Through this mechanism, community members also become aware of risky situations, feel more confident about intervening, and believe that bystanding has become a norm for their community.

Green Dot was novel in its conceptualization of how to select students to be trained to increase the likelihood that participants will diffuse the concept of bystanding to prevent violence in their peer networks. Rogers's (2003) work on diffusion of innovation served as the basis for understanding how bystanding behaviors might be transferred or diffused from person to person within a community or environment. Green Dot was designed on the assumption that by selecting students who were early adopters of new cultural and social innovations in the community, there could be optimal opportunities for these adopters, who were naturally influential in changing social paradigms, to spread or diffuse bystanding as an acceptable and desired response to conditions that promoted or condoned interpersonal violence (www.livethegreendot.com/gd_research_sciencedif.html).

The mechanism for the identification of early adopters is a Popular Opinion Leader (POL) strategy. This strategy has been identified in the literature as an effective mechanism for accelerating the pace at which an innovation is diffused in a population (Valente & Davis, 1999). The application of a POL's strategy to engaging trained community members to encourage behavior change has its roots in the HIV prevention literature (Kelly et al., 1991; Kelly et al., 1992). The application of the POL's selection strategy in bystander violence prevention programs is a novel feature of Green Dot (www.livethegreendot.com/gd_research_sciencedif.html). The program uses a qualitative strategy for triangulating information on influential students by asking a broad set of key informants to nominate persons based on a set of name-generator questions.

Implementation of Green Dot in the high school setting. Early success of Green Dot on the University of Kentucky campus (see Coker et al., 2011, for an evaluation) as well as the potential application of the program to other settings was influential in the effort to adapt and evaluate Green Dot in the high school setting (Cook-Craig et al., 2014). In 2009, the CDC awarded the University of Kentucky, along with their partners, the state sexual violence coalition and the 13 Rape Crisis Center programs that provided services across the state, a 5-year US\$2 million cooperative research agreement to conduct a 26-school randomized control trial to test the effects of Green Dot across these multiple levels of the social ecology.

In this setting, Green Dot consisted of a motivational/persuasive speech with students, school leaders, faculty, and administrators to bring awareness of the problem of dating and sexual violence and to motivate students to get involved. A separate program component targeted school student leaders (POLs) to receive in-depth training and skills building on preventing aggression, barriers to intervening, patterns of perpetration to inform bystander responses, and ideas for strategies to diffuse the message to their peers. In addition to preparing students to intervene in risky (meaning potentially violent) situations, Green Dot encouraged a proactive, empowered role for

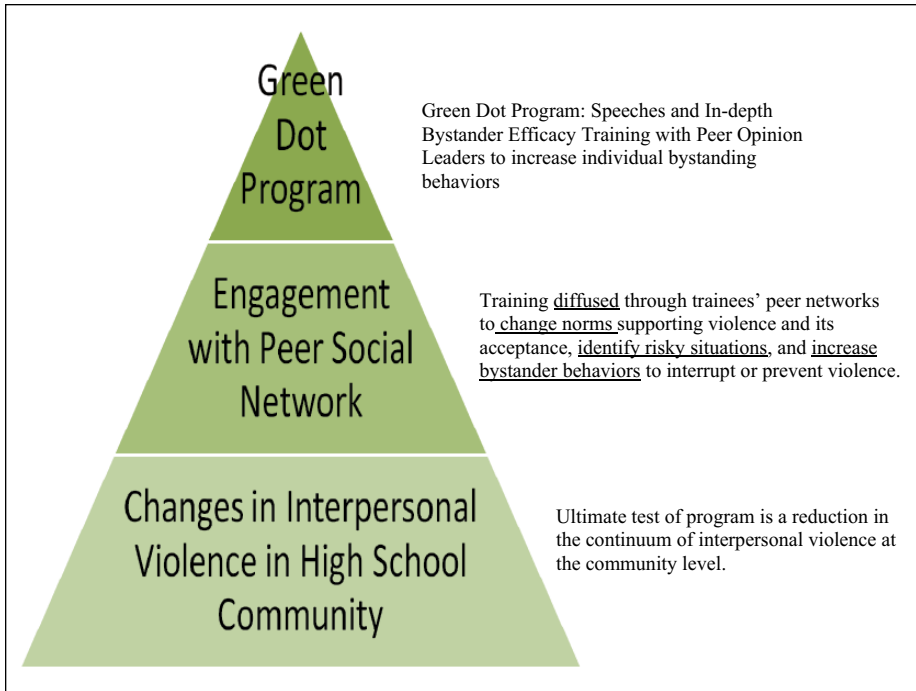


Figure 1. Hypothesized effect of Green Dot on intermediate (social norms, engaging peers, and increasing bystandering) and ultimate violence reduction outcomes across the high school's social ecology.

students to safely and effectively challenge and confront behaviors that likely underlay aggressive actions, such as sexual harassment; use of alcohol, drugs, or coercion to get sex, and joking about violence. Seeking opportunities to promote social norms that were not accepting of violence in the school community were also addressed.

A key feature of Green Dot is the effort to effect change across the social ecology of a community. Figure 1 illustrates the hypothesized impact of Green Dot across a high school community. Although early bystander intervention programs encourage individual-level change, Green Dot seeks to promote change on the individual, relationship, and community levels of a school's socioecology.

Initial impacts were hypothesized at the individual level. Motivational speeches and intensive bystander training were designed to recognize barriers to bystander action and to build skills in identifying and engaging in bystander behaviors in which students were willing to engage. The motivational speeches, given to the whole student body, prepared the school community for active bystandering by increasing students' knowledge about violence and the role that a bystander can have in responding to or preventing violence. The bystandering training targeted individuals' recognition of their potential role as active bystanders, trained students to recognize bystandering

opportunities, and helped them identify safe and viable bystanding options to respond to situations where violence was occurring or accepted. The effect of these trainings was expected to result in increased active bystanding by trained students.

Because these newly trained students were a select group of influential POLs, the second set of hypothesized changes were at the relationship level of the socioecology. As POLs, students were trained in strategies to diffuse the message and behaviors through their peer networks, thus, encouraging their friends to engage in similar behaviors. In addition, the training may affect the level of violence experienced in dating relationships. Trained students had a greater knowledge of violence that enhanced their ability to recognize violent versus healthy relationships for themselves, as well as skills to respond as a bystander when violence occurred in their peer relationships.

Finally, we hypothesized that over time, the effect of Green Dot will be experienced throughout the school community. POL literature suggested that, in a well-defined community, if 15% of influential members were trained and adopted new behaviors, the result would be a change in social norms in the community (http://www.effectiveinterventions.org/Files/POL_Procedural_Guide_8-09.pdf). By training a sufficient number of students, it was hypothesized that social norms would shift, resulting in a reduction in victimization and perpetration of sexual violence and other forms of power-based personal violence.

Overcoming Challenges to Traditional Bystander Evaluations

To fully test the Green Dot model in the high schools, there were several gaps in the structure of how bystander programs were previously evaluated that had to be addressed in the methodology of this high school intervention trial. First, the potential impact of Green Dot to prevent a range of aggressive behaviors needed to be identified and measured. Past evaluations of sexual violence prevention programs (and particularly bystander programs) relied heavily on students' reports of forced sexual intercourse. To more comprehensively evaluate Green Dot's impact on the high school setting, researchers measured the range of manifestations of interpersonal violence (see Figure 2 for an illustration) to which this program trained students to recognize and respond.

The second challenge in the construction of a robust evaluation was to prioritize active bystanding behavior change as a primary intermediate outcome in the evaluation plan. This required establishing a set of potential bystanding behaviors that high school students were likely to engage in and creating a subscale that reflected a student's engagement in these activities. A data collection plan was used to capture changes in observed and actual bystanding behaviors over time and with the implementation of training received in the intervention and control high schools. Because the Green Dot program was implemented in phases over time, we planned sufficiently time-framed data collection to allow annual spring surveying: at baseline, with Phrase 1 Green Dot implementation (motivational speeches), and with Phrase 2 Green Dot implementation (bystanding training). Data were collected over a 5-year period at all 26 high schools.

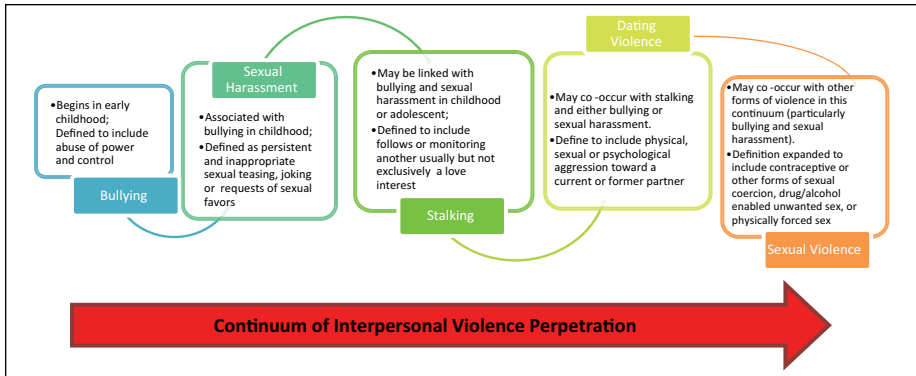


Figure 2. Continuum of interpersonal violence perpetration.

A third challenge in creating the evaluation strategy was to expand the evaluation paradigm to connect individual behavior change to community-level changes in rates of violence. Ultimately, although the intermediate outcome of individually trained students engaging in new bystander behaviors was critical, the goal was a reduction in violence in high school communities. In addition, a trend in violence prevention programming for adolescent populations is to reduce not only the victimization of sexual and dating violence but also violence perpetration (Cook-Craig & Ciarlantu, 2012). The evaluation of Green Dot in the high school setting created a measurement strategy for capturing data on both the victimization and the perpetration experiences of students.

Finally, the Green Dot strategy was predicated on an assumption that trained bystanders selected as early adopters using the POL strategy diffused new behaviors through their peer networks. The concept of capturing diffusion data on peer networks in violence prevention programs, and particularly bystander programs, was innovative. New strategies using social network analysis were necessary to test this component of the scientific basis of the program and to understand change at the relationship level of the socioecology.

Each of the challenges presents a unique opportunity to advance the science of how violence prevention programs are evaluated. What follows is a discussion of the work that was done in the planning of the Green Dot high school evaluation to address each of these methodological problems.

Green Dot Bystander Evaluation Strategy

The 5-year randomized control trial of Green Dot in Kentucky high schools tested the effectiveness of the program in both increasing active bystander behaviors and decreasing rates of violence victimization and perpetration over time. The study was designed to examine changes related to four aims:

1. To determine whether relative to students in high schools without Green Dot training, students in high schools with the Green Dot intervention reported lower sexual violence and teen dating violence perpetration rates;
2. To determine how the Green Dot intervention was diffused through peer social networks;
3. To determine how students, teachers, administrators, and Center Educators experienced the Green Dot intervention; and
4. To estimate the cost-effectiveness of the Green Dot bystander intervention program relative to no intervention from a societal perspective.

The ultimate outcome for this evaluation was sexual and dating violence perpetration. The intermediate outcomes were active bystander behaviors and social norms. Annual panel surveys at each of the high schools provided the data to determine whether the intervention changes violence rates over time in the intervention and control high schools ($n = \sim 9,000$ students in the intervention and 9,000 in control high schools, annually) and with the phased implementation of Green Dot. In addition, a cohort study of those who had and had not received Green Dot bystander training was ongoing among students in the intervention schools pre- and post-bystander training across Green Dot implementation. Students in cohorts were surveyed pre-training and 2 times post training, after the bystander training was delivered. This cohort study also provided an empirical test of whether and how Green Dot is diffused through the high school beginning with student popular opinion leaders.

Data Collection Strategy

Annual data collection involved conducting an annual panel survey of high school students at each high school during the early spring semester over the 5 years of the grant (Spring 2010-2015). The purpose of this survey was to determine prospectively whether the intervention reduced perpetration of power-based personal violence in those high schools with Green Dot relative to those without the intervention. The panel survey was a 99-question survey conducted during school hours in selected classes using the model familiar to schools in Kentucky, the anonymous Youth Risk Behavior Survey (YRBS; U.S. Department of Health and Human Services, CDC, 2012). The 26 high schools yielded an analytic sample of more than 18,000 students annually.

To determine the direct effect of the intervention on social norms and bystander behaviors, a cohort study of students who received the bystander training (exposed) and those in the same high schools who did not receive this training (unexposed) was conducted. Bystander trainings were conducted in both the fall and spring. The cohort study was a three-survey cycle, in which trained and non-trained students were asked about their observations and experiences of active bystander pre-training, 1 month post training, and 3 months post training. The beginning of each survey cycle coincided with scheduled bystander trainings according to scheduling availability in intervention schools. Both groups were asked 39 questions, including items that determined

the effect of the training on knowledge, attitudes, and active bystanding. Annually 1,300 students across the 13 intervention schools were targeted to complete the cohort study.

Identifying a Continuum of Adolescent Violence Experiences

Figure 2 illustrates a conceptual model suggesting that adolescents are potentially at risk of exposure to a continuum of types of interpersonal violence as either a victim or perpetrator or both during their high school years. Although most studies on sexual violence of adolescents focused on measuring forced sex or sexual assault, we hypothesized that students were potentially exposed to this continuum and that more commonly experienced forms of violence, such as sexual harassment or stalking behaviors, may be an earlier indication of program success than waiting for rare cases of physically forced sexual assaults to occur; looking across the continuum improved study power and reduced the time required to see changes associated with program implementation. The evaluation of Green Dot in high schools represented the first comprehensive statewide data collection of this comprehensive continuum of interpersonal violence many high school students experience.

Development and use of measures. Tables 2 and 3 provide specific items for all measures we used in the panel survey at baseline. These tables provide psychometric properties of measures, including Cronbach's alpha as a measure of scale internal consistency, the scale range, response options, and each item's mean frequency and loading factor within the designated scale. Table 2 includes the intermediate outcomes, while Table 3 provides the ultimate outcome measure of interpersonal violence victimization and perpetration.

Intermediate measure of change. To rigorously test the Green Dot model shown in Figure 1, several measures needed to either be developed for or tested with an adolescent population of students in high schools. Two types of measures were geared toward the evaluation of change on the individual level of the socioecology, including measures to track changes in social norms and measures to track the extent to which students observed or engaged in active bystanding behaviors. The third type of measure was designed to capture change at the relationship level of the socioecology and tracked engagement of peers in violence prevention activities.

Change in social norms. Measures for assessing the extent to which individuals endorse rape myths, dating violence, and peer support of the use of abuse were well established in the literature on sexual and dating violence on the college campus. In the evaluation of Green Dot in high schools, social norms and attitudes supporting violence were assessed using three measures including the following:

Illinois Rape Myth Acceptance Scale–Short Form, a 20-item scale that assessed endorsement of seven types of rape myths (Payne, Lonsway, & Fitzgerald, 1999).

Table 2. Instruments Used to Measure Intermediate Outcomes: Violence Acceptance, Actual and Observed Bystanding by Subscale, and Engaging Peer Networks.

Violence acceptance		
Illinois Rape Myth Scale (Payne, Lonsway, & Fitzgerald, 1999) —Abbreviated to seven items: Cronbach's $\alpha = .750$; Range = 0-21; Response options: 0 = <i>strongly disagree</i> , 1 = <i>disagree</i> , 2 = <i>agree</i> , 3 = <i>strongly agree</i>		
This (next two) section asks your opinion about sexual and dating violence. Thinking about your own feelings and beliefs, please indicate how much you personally agree or disagree with each statement. There are no right or wrong responses	M	Loading factor
1. Girls should have sex with their boyfriend or the guy they are dating when he wants.	0.622	0.751
2. If a guy spends money on a date, the girl should have sex with him in return.	0.465	0.789
3. Guys should respond to dates' or girlfriends' challenges to authority by insulting them or putting them down.	0.310	0.660
4. If a girl is sexually assaulted while she is drunk, she is to blame for letting things get out of control.	1.121	0.550
5. Sexual assault charges are often used as a way of getting back at guys.	1.226	0.591
6. Many girls lead a guy on and then they claim sexual assault.	1.30	0.562
7. When girls are sexually assaulted, it is often because the way they said "no" was unclear	1.06	0.504
General Dating Violence Acceptance Scale (Foshee et al., 1996): Cronbach's $\alpha = .73$; Range = 0-15; Response options: 0 = <i>strongly disagree</i> , 1 = <i>disagree</i> , 2 = <i>agree</i> , 3 = <i>strongly agree</i>		
1. There are times when dating violence between couples is okay.	0.668	0.520
2. A girlfriend or boyfriend who makes their girlfriend or boyfriend jealous on purpose deserves to be hit.	0.609	0.703
3. Sometimes violence is the only way to express your feelings.	0.613	0.773
4. Some couples have to use violence to solve their problems.	0.611	0.777
5. Violence between couples is a private matter and others should not get in the way or get involved.	0.753	0.686
Peer support for violence (DeKeseredy, 1990) : Cronbach's $\alpha = .70$; Range = 0-9; Response options: 0 friends (= 0), 1-2 (= 1), 3-5 times (= 2), 6+ friends (= 3)		
1. How many of your friends have forced someone to have sexual activity with them that caused their partner to cry, scream, plead, hit or fight back	0.270	0.746
2. How many of your friends have used physical force, such as hitting to solve fights with their boyfriends or girlfriends?	0.479	0.843
3. How many of your friends insult their girlfriend or boyfriend, swear at them, or try to control everything their boyfriend or girlfriend does	0.987	0.779
Actual bystanding behaviors: Cronbach's $\alpha = .856$; Range = 0-21; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6+ times (= 3)		
In the past 12 months, how often did YOU		
1. Tell someone to stop talking down to, harassing, or messing with someone else?	0.774	0.602
2. Speak up when you heard that someone who was forced to have sex or hurt by a boyfriend/girlfriend was to blame?	0.235	0.792
3. Talk to a friend who was being physically hurt by a boyfriend/girlfriend?	0.350	0.790
4. Ask someone who looked very upset at a party whether he or she was okay or needed help?	0.519	0.756

(continued)

Table 2. (continued)

5. Ask a friend whether he or she needed to be walked or driven home from a party if he or she looked upset?	0.383	0.710
6. Speak up to someone who was bragging or making excuses for forcing someone to have sex with them?	0.228	0.716
7. Got help for a friend because he or she had been forced to have sex or was physically hurt by a boyfriend/girlfriend?	0.152	0.760

Observed bystanding behaviors: Cronbach's $\alpha = .813$; Range = 0-21; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6+ times (= 3)

In the past 12 months, how many times did you see or hear of someone at your high school

1. Tell someone to stop talking down to, harassing, or messing with someone else?	0.910	0.539
2. Speak up when you heard that someone who was forced to have sex or hurt by a boyfriend/girlfriend was to blame?	0.244	0.737
3. Talk to a friend who was being physically hurt by a boyfriend/girlfriend?	0.379	0.740
4. Ask someone who looked very upset at a party whether he or she was okay or needed help?	0.599	0.671
5. Ask a friend whether he or she needed to be walked or driven home from a party if he or she looked upset?	0.447	0.650
6. Speak up to someone who was bragging or making excuses for forcing someone to have sex with them?	0.226	0.745
7. Got help for a friend because he or she had been forced to have sex or was physically hurt by a boyfriend/girlfriend?	0.149	0.719

Engaging peers in violence prevention: Cronbach's $\alpha = .77$; Range = 0-15; $n = 17,654$; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 3), 6+ times (= 6)

In the past 12 months

1. How many times has someone talked with you about what you can do to stop dating violence or unwanted sexual activity?	0.451	0.627
2. How many times have you and your friends ever talked about activities you could do or join them in activities that might help prevent dating violence or unwanted sex in your school or your community?	0.171	0.763
3. How many times have you and your friends ever text messaged, instant messaged, blogged, emailed each other or used other technology to discuss activities or things you could do to prevent dating violence or unwanted sexual activity?	0.139	0.747
4. How many times have you talked with your friends about what you can do to keep yourself or others safe from dating violence or unwanted sexual activity?	0.249	0.811
5. How many times have you talked with your friends about being safe in dating relationships?	0.649	0.656

Scale developers found this scale to have high reliability and construct validity. In recent use of this scale in the evaluation of Green Dot in the college setting, the alpha reliability for a shortened (7-item) rape myth scale was adequate ($\alpha = .80$; Coker et al., 2011).

Acceptance of dating violence norms, an eight-item scale assessing norms accepting dating violence, developed by Foshee et al. (1996).

Peer Support of Abuse Scale, a seven-item scale developed by DeKeseredy (1990) that assessed peer advice that influenced men to assault their dating partners. In a

Table 3. Instruments Used to Measure Long-term Outcomes: Victimization and Perpetration of Stalking, Dating Violence, Sexual Harassment, and Sexual Violence.

Frequency of interpersonal violence by type and directionality (victimization and perpetration)

Stalking (Victimization): Cronbach's $\alpha = .661$; Range = 0-12; $n = 18551$; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6-9 times (= 3), 10+ times (= 4)

In the past 12 months, how many times were you afraid for your personal safety because the following happened	M	Loading factor
1. You were followed, spied on, or monitored using computer software, cameras, listening tools, or GPS	0.174	0.741
2. Someone showed up at your home, school, or work or waited for you when you did not want them to.	0.225	0.824
3. You received unwanted phone calls, gifts, emails, text messages, or notes/pictures posted on social networking sites for example, Facebook, MySpace, or Twitter	0.545	0.751

(not part of scale) How did you know the person who did this? Please choose the person you were most afraid of. Response options: I was never afraid for my personal safety because of these things, Boyfriend or girlfriend, Ex-boyfriend or ex-girlfriend, Friend, Someone I knew from school, Someone I knew but not from school

Stalking (Perpetration): Cronbach's $\alpha = .721$; Range = 0-12; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6-9 times (= 3), 10+ times (= 4)

In the past 12 months, how many times have YOU done the following to someone that you may have been interested in dating or hooking up with in the past or now: Remember this survey is anonymous.

1. Followed, spied on, or observed someone using computer software, cameras, listening tools, or GPS	0.102	0.806
2. Showed up at someone's home, school, or work or waited for them.	0.118	0.778
3. Sent unwanted gifts, emails, text messages, phone calls, notes, or pictures posted on social networking sites for example, Facebook, MySpace or twitter	0.121	0.818

Dating violence (Victimization): Cronbach's $\alpha = .824$; Range = 0-12; among those in a relationship; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6-9 times (= 3), 10+ times (= 4)

In the past 12 months, how many times has a current or previous boyfriend or girlfriend

1. Tried to control you by always checking up on you, telling you who your friends could be, or telling you what you could do and when	0.642	0.715
2. Damaged something that was important to you on purpose?	0.208	0.706
3. Shout, yell, insult, or swear at you?	0.794	0.785
4. Threatened to hit, slap, or physically hurt you?	0.294	0.827
5. Hit, slap, or physically hurt you on purpose?	0.217	0.795

Dating violence (Perpetration): Cronbach's $\alpha = .800$; Range = 0-12; among those in a relationship; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6-9 times (= 3), 10+ times (= 4)

(continued)

Table 3. (continued)

During the past 12 months, how many times did YOU

1. Try to control a current or previous girlfriend or boyfriend by always checking up on them, telling them who their friends could be, or telling them what they could do and when	0.248	0.672
2. Damaged something on purpose who was important to a boyfriend or girlfriend?	0.085	0.719
3. Shout, yell, insult, or swear at a current or previous girlfriend or boyfriend?	0.496	0.715
4. Threatened to hurt a current or previous boyfriend or girlfriend?	0.114	0.801
5. Hit, slap, or physically hurt a current or previous boyfriend or girlfriend on purpose?	0.129	0.801

Sexual harassment (Victimization): Cronbach's $\alpha = .673$; Range = 0-12; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6-9 times (= 3), 10+ times (= 4)

In the past 12 months, how many times did another high school student

1. Tell you sexual stories or jokes that made you uneasy?	0.570	0.803
2. Make gestures, rude remarks, or use sexual body language to embarrass or upset you?	0.467	0.832
3. Keep asking you out on a date or asking you to hookup although you said "No?"	0.630	0.695

Sexual harassment (Perpetration): Cronbach's $\alpha = .710$; Range = 0-12; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6-9 times (= 3), 10+ times (= 4)

In the past 12 months, how many times did YOU

1. Tell sexual stories or jokes that made another high school student uneasy?	0.266	0.846
2. Make gestures, rude remarks, or use sexual body language to embarrass or upset another high school student?	0.219	0.860
3. Keep asking another high school student out on a date or ask to hookup although they said "No?"	0.108	0.974

Sexual violence (Victimization): Cronbach's $\alpha = .708$; Range = 0-12; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6-9 times (= 3), 10+ times (= 4)

In the past 12 months, how many times have YOU

1. Had sexual activities although you did not really want to because either they threatened to end your friendship or romantic relationship if you didn't or you felt pressured by the other person's constant arguments or begging	0.204	0.789
2. Had sexual activities when you did not want to because the other person threatened to use or used physical force (like twisting your arm, holding you down) if you did not agree	0.074	0.809

(continued)

Table 3. (continued)

3. Had sexual activities when you did not want to because you were drunk or on drugs?	0.140	0.786
Contraceptive interference (Victimization): Cronbach's $\alpha = .736$; Range = 0-12; (among those in a relationship); Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6-9 times (= 3), 10+ times (= 4)		
In the past 12 months, how many times has a current or previous boyfriend/girlfriend		
1. Said to you "You want us to use birth control or condoms so you can sleep around with other people?"	0.120	0.700
2. Said to you "If we have a baby, you will never have to worry about me leaving you. I will always be around?"	0.517	0.596
3. Said to you "You would have a baby with me if you really loved me?"	0.180	0.728
4. In the past 12 months, has a current or previous boyfriend or girlfriend not allowed you to use birth control or condoms when you wanted to	0.150	0.731
5. In the past 12 months, has a current or previous boyfriend or girlfriend forced you to have sex when you were not using birth control or condoms	0.118	0.733
Sexual violence (Perpetration): Cronbach's $\alpha = .817$; Range = 0-12; $n = 18,098$; Response options: 0 times (= 0), 1-2 times (= 1), 3-5 times (= 2), 6-9 times (= 3), 10+ times (= 4)		
In the past 12 months, how many times have YOU		
1. Had sexual activities with a high school student because you either threatened to end your friendship or romantic relationship? if they didn't or because you pressured the other person by arguing or begging	0.065	0.880
2. Had sexual activities with another high school student by threatening to use or used physical force (twisting their arm, holding them down, etc.)	0.050	0.886
3. Had sexual activities with another high school student because she or he was drunk or on drugs?	0.105	0.800

Note. GPS = global positioning system.

recent use of this scale in the evaluation of Green Dot in the college setting, this scale demonstrated adequate reliability ($\alpha = .78$; Coker et al., 2011).

Active bystanding behaviors. The most direct measure of Green Dot efficacy was an increase in students' adoption of active bystanding behaviors. Active bystanding was measured by questions that both captured behaviors that trained bystanders observed others doing and behaviors that trained bystanders engaged in themselves. Students were asked to respond to the number of times they observed each of the seven behaviors in the past 12 months and the number of times they actually engaged in each behavior in the past 12 months.

Engagement of peers in violence prevention activities, a five-question scale developed to quantify the activities that trained bystanders did with their peers to prevent violence (see Table 2 for psychometric properties of these questions).

Measuring Violence Victimization and Perpetration

Using the conceptualization of the continuum of interpersonal violence experiences (Figure 2), we used measures to capture students' experiences of victimization and perpetration including bullying, sexual harassment, stalking, dating violence, and unwanted sexual activities (sexual violence). Students were asked to report separately on the number of victimization experiences and perpetration experiences they had experienced over the past 12 months.

Capturing the Diffusion of Bystanding Through Peer Networks

One of the more methodologically difficult components of the design of the high school Green Dot evaluation was the diffusion of new behaviors throughout the school community through peer networks. Ideally capturing data on the social ties and number of bystanding behaviors completed on all students in the high school would allow for a full social network analysis of diffusion. School size was an inhibiting factor, however, making the collection of data from all students impractical. For that reason, the research team chose to examine diffusion of bystander behaviors through social ties of trained students' ego networks. At training, POLs were asked name-generator questions that produced a bounded list of friends and acquaintances from which diffusion bystander behaviors could be tracked.

An additional difficulty in designing strategies for testing diffusion stemmed from the fact that some students could be identified as a member of the peer network of multiple trained students. It was necessary to not only analyze individual peer networks of POLs, but also to look at differences in bystanding patterns of students who were friends with multiple trained POLs versus students who had less exposure to trained POLs through their peer networks.

In the evaluation of Green Dot in the high school trial, diffusion of bystanding behaviors was tracked in the cohorts of trained and non-trained students that took pre-, 1-month post, and 3-month post surveys. Non-trained students were matched with trained students who named them in the name-generator questionnaire, delineating who was in their social network. Non-trained students who were not listed on any trained students' peer network were considered to have the least exposure to Green Dot and, therefore, were expected to have little or no change in their bystanding behaviors.

It was hypothesized that although the greatest change in the number of bystanding behaviors would occur in the trained student groups, there would also be an increase in bystanding behaviors of friends of trained students over time. Because we recognized the potential importance of exposure to the Green Dot message, it was also hypothesized that non-trained students who had a greater number of trained friends would have a greater increase in bystanding behaviors than non-trained students who were friends with less trained students. Active bystanding behaviors of trained and non-trained students in peer networks were tracked using the active bystanding questions included in Table 2.

Process Evaluation

To capture differences in the implementation of Green Dot across the 13 intervention sites, the trial included a process evaluation that included the collection of several types of data through the use of focus groups, speech/training debriefing logs, and audio recordings of speeches and trainings (see Table 4). The process evaluation was designed to collect data on (a) the implementation of the Green Dot curriculum with fidelity and use of workbooks in the 13 intervention schools, (b) attendance and knowledge acquisition of educators who attended training to deliver the Green Dot curriculum, and (c) assessment of community-led efforts to support proactive engagement of student bystanders to prevent perpetration of violence. To collect process data in each of these areas, three separate populations were surveyed or interviewed as part of the study process evaluation.

Process Evaluation Population 1: Center educators. Center educators were hired and trained by their respective centers. Approximately 26 educators were hired and trained to deliver the Green Dot curriculum to the 13 intervention high schools. Educators had to be trained in a face-to-face 4-day training to be certified to deliver the Green Dot curriculum in the high schools. Post-training educators were required to audio record each speech and training they gave. These audio recordings were analyzed for fidelity to the Green Dot curriculum. To ensure interrater reliability, a minimum of two raters listened to each audio recording to assess adherence to the scientific basis of Green Dot.

In addition, trained educators completed a debriefing log within 48 hours of delivering a speech or facilitating a bystander training. In addition to collecting data on the number of students participating in the training, the debriefing log contained a set of open-ended qualitative questions that explored successes and challenges in Green Dot implementation as well as capturing qualitative data on differences across sites on implementation of the program.

Process Evaluation Population 2: Key stakeholders at each intervention school. Center educators worked with study investigators to generate a list of key stakeholders in each school including teachers, administrators, Community Prevention Team (CPT) members, and students. Key stakeholders were interviewed in focus groups to assess successes and challenges in implementation.

Process Evaluation Population 3: CPT members. Each center formed a CPT comprised of key community stakeholders, who developed strategies to support the adoption of new community norms associated with the program. Approximately 130 CPT members were recruited across the 13 centers. Using web surveys, CPTs participated in an asset assessment that captured data on community assets available to support violence prevention. In addition, qualitative analysis of regional prevention plans and CPT meeting minutes provided data on community activities that support bystander behaviors and violence prevention across study site communities.

Table 4. Elements of the Green Dot Trial Process Evaluation.

Type of assessment	Measures	Constructs
Fidelity to curriculum	Audio Recordings	Adherence to eight elements of scientific basis, gender neutrality, use of disclosure, presentation style
Green Dot implementation	Debriefing logs	Training demographics, questions addressed, problems encountered, successes
Green Dot activities	Focus groups; Coaching calls; PIC meeting minutes	Green Dot activities in implementation schools, implementation challenges and solutions, adherence to implementation activities
Community assets	Web-based asset assessment	Support, empowerment, boundaries and expectations, constructive use of time
Community prevention team activities	Meeting minutes; web-based surveys	Membership/attendance, activities planned and implemented, discussion topics

Note. PIC = Program Implementation Committee.

Plans for Evaluation

The ultimate goal of the research was twofold: (a) to examine the efficacy of Green Dot in reducing interpersonal violence in a high school setting when compared with demographically similar schools in the same region not receiving this intervention, and (b) to disseminate these findings in an accessible format to stakeholders.

To address this latter goal, the research team collaborated with a data monitoring committee consisting of community stakeholders, funders, and researchers. The committee had two important functions, including providing recommendations on data interpretation and dissemination and providing recommendations on stopping the trial prior to conclusion of the 5 years if the program demonstrated evidence of effectiveness. Recognizing that members of the data monitoring committee may differ in their orientation to research methods, intervention implementation, and the need for effective program implementation, the research team brought findings and publications to the committee to discuss the data.

To address the former aspect of the ultimate goal, in Years 2 to 5 (post-intervention implementation), we compared dating and sexual violence rates (both victimization and perpetration) as well as active bystanding behaviors in the intervention and delayed intervention high schools. The primary focus of these analyses and the stop rule was a reduction in violence perpetration. If we consistently saw a statistically significant reduction in dating violence/sexual violence by Year 3, we would consult

with the state coalition and the 13 Rape Crisis Centers to determine whether all high schools should receive the Green Dot/POL intervention. "Consistent" is defined as a statistically significant reduction across at least 2 years post-intervention implementation, where statistical significance is defined using a significance level of .01 (Pocock, 1977). Two sets of comparisons were used: (a) comparing rates of bystanding and violence outcomes by intervention relative to control schools over time, and (b) comparing rates by the interventions individual students reported receiving within the intervention design. The former analysis is often referred to as *analysis as randomized*, while the latter as *analysis as experienced*. Because we have extensive process evaluation data, we also proposed the use of these data to create a measure of the individual educator's fidelity to the program in her implementation of the program across the intervention sites. Examples of questions of interest included the number and timing of how the 5-hour training was delivered, optimal strategies for identifying student POLs, and how to negotiate barriers to accessing students in the school settings. Annually during the trial, fidelity assessment recording data were used to make recommendations to educators regarding how to increase fidelity to the curriculum.

At the end of the trial, the findings were expected to be useful in the development of implementation materials that can be distributed to other organizations, coalitions, or states seeking to implement Green Dot in the high school setting. With the assistance of our data monitoring committee, other stakeholders, and the CDC, we will provide all participating high schools with the evaluation findings. All high schools will have the option to continue or adopt the Green Dot program, with rape crisis center educators providing the curriculum. With CDC colleagues' assistance, we will also provide schools with other evidence-based programs that suggest their efficacy.

Conclusion

The emergence of bystanding as a violence prevention paradigm and the ability to design a randomized, controlled intervention trial in a relatively large number of high schools have brought unique and challenging opportunities that have allowed the Green Dot Kentucky high school evaluation research team to advance the methodological boundaries about what we measure as interpersonal violence victimization and perpetration and how we measure them in a large population-based sample. Just the collection of baseline data on 5 types of interpersonal violence from more than 18,000 students statewide represents a huge leap forward, as this is the most comprehensive data collection of sexual and teen dating violence victimization and perpetration experiences to date. What follows in the remainder of this special issue is a series of articles that detail findings from that baseline data.

This evaluation will also afford us the rare opportunity to test the links between program successes across the socioecology. Specifically, we are in a position with this project to begin to examine how training individuals diffuses new bystanding behaviors to reduce sexual and teen dating violence into the school community and how that affects the overall rate of both victimization and perpetration of violence in those schools.

There are still conceptual and methodological questions that remain to be answered. Specifically, more conceptual exploration is needed on the interrelationships between different forms of violence. In addition, much more work is needed to build robust models of testing diffusion on innovations such as Green Dot in the high school setting where data collection constraints inhibit full network analysis modeling. This 5-year project will continue to explore these open questions.

Authors' Note

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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