

2009

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Wood, M. D., DeJong, W., Fairlee, A. M., Lawson, D., Lavigne, A. M. & Cohen, F. (2009). Common Ground: An Investigation of Environmental Management Alcohol Prevention Initiatives in a College Community, *Journal of Studies on Alcohol and Drugs*, (s16), 96-105. doi: 10.15288/jsads.2009.s16.96
Available at: <http://dx.doi.org/10.15288/jsads.2009.s16.96>

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Common Ground: An Investigation of Environmental Management Alcohol Prevention Initiatives in a College Community*

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ABSTRACT. Objective: This article presents an evaluation of Common Ground, a media campaign-supported prevention program featuring increased enforcement, decreased alcohol access, and other environmental management initiatives targeting college student drinking. **Method:** Phase 1 of the media campaign addressed student resistance to environmentally focused prevention by reporting majority student support for alcohol policy and enforcement initiatives. Phase 2 informed students about state laws, university policies, and environmental initiatives. We conducted student telephone surveys, with samples stratified by gender and year in school, for 4 consecutive years at the intervention campus and 3 years at a comparison campus. We did a series of one-way between-subjects analyses of variance and analyses of covariance, followed by tests of linear trend and planned comparisons. Targeted outcomes included perceptions of enforcement and alcohol availability, alcohol use, and alcohol-impaired driving. We examined archived police reports for

student incidents, primarily those resulting from loud parties. **Results:** There were increases at the intervention campus in students' awareness of formal alcohol-control efforts and perceptions of the alcohol environment, likelihood of apprehension for underage drinking, consequences for alcohol-impaired driving, and responsible alcohol service practices. There were decreases in the perceived likelihood of other students' negative behavior at off-campus parties. Police-reported incidents decreased over time; however, perceived consequences for off-campus parties decreased. No changes were observed for difficulty finding an off-campus party, self-reported alcohol use, or alcohol-impaired driving. **Conclusions:** The intervention successfully altered perceptions of alcohol enforcement, alcohol access, and the local alcohol environment. This study provides important preliminary information to researchers and practitioners engaged in collaborative prevention efforts in campus communities. (*J. Stud. Alcohol Drugs*, Supplement No. 16: 96-105, 2009)

THERE IS AN EMERGING CONSENSUS that alcohol problems on U.S. college campuses should be addressed through a comprehensive approach that features environmentally focused prevention strategies (DeJong and Langford, 2002; Toomey et al., 2007; Toomey and Wagenaar, 2002). This method, called environmental management (EM), features several key strategies, including limiting alcohol availability, restricting alcohol marketing and promotion, and developing and enforcing new policies to combat alcohol-impaired driving and to restrict the times, places, and circumstances in which alcohol can be purchased and consumed.

The research literature on environmental approaches to prevention with college students is small but increasing. Weitzman et al. (2004), in their evaluation of campus and community coalitions affiliated with the "A Matter of Degree" (AMOD) initiative, observed that, when optimally

implemented, such coalitions can work effectively to deploy EM strategies that reduce heavy drinking, driving after drinking, and other alcohol-related problems. Clapp et al. (2005) combined environmentally focused prevention strategies and a health communications campaign to reduce college student self-reports of driving under the influence (DUI). In a recent review, Toomey et al. (2007) concluded that, although findings suggest the utility of combining multiple EM strategies, work is still needed to identify the optimal combination of approaches.

The University of Rhode Island (URI) embraced an EM approach in the mid-1990s when administrators implemented a set of new policies to change the campus drinking culture. There were several motivating factors, including the Princeton Review's designation of URI as the top party school in the United States for 3 consecutive years (Carothers et al., 2006) and a 1993 study showing that URI students drank at levels far above the national average (Wechsler et al., 2002). URI strengthened and clarified its alcohol policies, including a new "three strikes" policy, which culminates in a two-semester suspension for a third violation. To return to campus, students must provide proof that they obtained an assessment and any necessary treatment. URI also imposed a ban on alcohol service at all university functions (Carothers et al., 2006).

*This research was supported by National Institute on Alcohol Abuse and Alcoholism grants U01 AA014749 to Mark D. Wood and U18 AA015482 to Fran Cohen.

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Off-campus problems remained a challenge. Several thousand juniors and seniors live in rented houses in Narragansett, a resort community with approximately two dozen clubs, taverns, and bars. Both alcohol-impaired driving and student parties were significant problems. Some community residents charged that URI's tougher stand against on-campus drinking had pushed student drinking into the community. In the year 2000, URI officials joined with town leaders to form the Narragansett-URI Coalition, a monthly forum for monitoring police actions, problem houses, and university responses and for improving communication and joint problem solving. The coalition was co-chaired by URI's vice president for student affairs and the Narragansett chief of police. Later, URI established a university hotline to expedite responses to citizen complaints, which were typically the result of loud student parties off campus (Gebhardt et al., 2000). URI produced a guide for students living off campus that provided information on the local community (e.g., the coalition, neighborhood associations), town ordinances and state laws (e.g., noise regulations, alcohol laws), and responsibilities of renters. Lastly, URI implemented a parental notification policy for arrests resulting from underage possession of alcohol or use of a false identification (ID).

The coalition's initial efforts included developing a model lease with explicit penalties for police incidents; establishing a system to notify absentee landlords when police were called for a disturbance; launching an annual neighborhood spring cleanup day; and supporting a keg registration bill in the Rhode Island General Assembly. In the early stages, the coalition did not develop a strategy for addressing alcohol-impaired driving, underage drinking, and excessive alcohol use.

The coalition work received a boost in 2003 when URI received major grants for Common Ground, a 5-year project to reduce alcohol-impaired driving, underage alcohol use, and excessive drinking among URI students. The plan called for URI officials to develop the coalition's capacity (Florin et al., 2000), implement EM strategies in the local community, and continue reforming URI's fraternities and sororities. By 2005, however, with the coalition exhibiting little additional progress, URI staff switched to a more directed action approach, by reaching out to specific organizations, most notably the police and alcohol retailers in Narragansett and nearby South Kingstown. That fall URI launched a new set of EM efforts through a student-centered media campaign, RhodeMap to Safety (RMS), which made URI students more aware of existing URI rules, state DUI laws, and enhanced law enforcement.

Phase 1: Building student support

At the beginning of the fall 2005 semester, the RMS campaign produced a supportive political context for Common Ground by announcing the results of a 2004 random-sample

telephone survey of students (see "Method"). The results showed strong student support for several EM policies (DeJong, 2003), including increasing the use of designated driver programs (88.5%); increasing enforcement of DUI laws (83.3%); and training bartenders to cut off intoxicated patrons (82.7%; DeJong et al., 2006). The central message was that a clear majority of URI students *did* support alcohol policy and enforcement efforts owing to health and safety concerns. In that context, the program's initiatives could then be presented as a response to student concerns (DeJong et al., 2007). The media campaign drew particular attention to the strong support for stricter enforcement of drinking and driving laws, which set the stage for launching Phase 2.

Phase 2: Changing perceptions of the alcohol environment

At a well-publicized press conference in September 2005, Common Ground introduced the RhodeMap to Safety campaign and then announced that both the Narragansett Police Department and URI's campus police were receiving combined grants of \$34,000 to support increased enforcement (particularly DUI patrols) over the next year. Over 3 years, such grants totaled more than \$50,000. The RMS campaign notified students that campus and town officials were taking these steps in the name of student safety to deter both alcohol-impaired driving and underage drinking. The media campaign later drew attention to the state's .08% blood alcohol concentration (BAC) per se law for drivers 21 years old and older and its "zero tolerance" law, which prohibits drivers younger than age 21 from driving with a BAC of .02% or higher. The 2004 survey revealed that many URI students did not know these two laws. The campaign also reminded students about URI's parental notification and "three strikes" policies.

In October 2005, Common Ground announced a second RMS initiative: the Cooperating Tavern and Package Store Programs (Gebhardt et al., 2000). At a press conference, nearly all of Narragansett's bar and tavern owners signed a declaration of their intention to continue training and working with employees to follow responsible beverage service (RBS) practices, including ID checks, confiscation of false IDs, and refusing sales to intoxicated patrons (Saltz and Stanghetta, 1997; Toomey et al., 2001). A companion program for package store owners focused on preventing off-premises sales to customers younger than age 21 and purchases of alcohol for minors. One year later, Common Ground held a similar press event in South Kingstown, another municipality bordering the campus. The RMS campaign featured paid advertisements in local newspapers and in the URI student newspaper to congratulate the owners and to outline RBS practices. The retailers posted a storefront sign ("Responsible Alcohol Beverage Service Practiced Here") to remind the public, including students, that URI,

local retailers, and town officials had united to prevent community alcohol problems.

The URI-based Common Ground staff had worked with the Rhode Island General Assembly to draft a bill that imposed training and certification requirements for the staff at on-premises alcohol outlets. The new law took effect January 1, 2006, giving the campaign another opportunity to publicize the program. RMS continuously promoted the Cooperating Tavern and Package Store Programs, especially at the beginning of each academic year.

Common Ground also used the RMS campaign to promote four on-campus initiatives. First, in 2006, a new student organization developed "Rhody Rides," a student-run safe ride program similar to a Texas A&M University program (Zimmerman and DeJong, 2003). Rhody Rides operated only during the 2006-2007 academic year; still, it provided additional opportunities to promote Common Ground's law enforcement initiative. Second, URI made off-campus conduct subject to its disciplinary system when either one of two conditions were met: (1) the student's behavior would have warranted discipline if it occurred on campus and the student was arrested or cited for violating local, state, or federal laws or (2) the student may pose a threat to himself or others. Third, RMS promoted workshops on social host liability and safe party procedures for fraternity and sorority members and other interested students. In January 2007, URI began workshops for students who would be living off campus the next year, focusing on their responsibilities as good neighbors and community members. Fourth, Common Ground hired a full-time fraternity/sorority advisor to work with the Greek Advisory Council to expand chapter reform efforts and enhance members' engagement with URI and the broader community.

The RMS campaign typically distributed the following materials each week: two quarter- or half-page campus newspaper advertisements, one large poster in the student union lobby, 35 small posters placed around campus, 400 table tents at campus dining facilities, and one or two emails. Other activities included displaying a street banner, advertisements in community newspapers, letters to the editor, message inserts in orientation packets for new students, public service advertisements on the campus radio station, stadium announcements, display tables at the commuter-student parking lots, and giveaway items (e.g., water bottles, pens, and Frisbees) at special events.

The Narragansett-URI Coalition continued to meet each month. In 2005, the Narragansett Police began to enforce a new town policy of placing large orange stickers on houses where neighborhood disturbances occurred. In 2007, the town council passed an ordinance to apply tougher sanctions against these houses.

The present study examined the impact of Common Ground in changing students' perceptions of the alcohol environment, particularly with respect to enforcement and

alcohol availability. We also examined alcohol use and alcohol-impaired driving outcomes as well as police incidents.

Method

Procedure

To evaluate Common Ground, we conducted random-sample telephone surveys each fall at URI (2004-2007) and at a large, New England public state university that served as a comparison campus (2005-2007). Each year we selected random samples from the schools' lists of full-time undergraduate students, ages 18-25 years old. Following a prenotification email, trained interviewers telephoned participants between October and December and explained the study's purpose, read the consent form, and offered a \$10 gift certificate for participation. With the respondent's verbal consent, the interviewer conducted the approximately 30-minute survey. Institutional review boards at URI and at the comparison campus approved the study procedures.

The interviewers made calls until completing at least 500 surveys and meeting stratification quotas for gender and year in school. Interviewers made up to six telephone attempts per student. When only a home-of-record phone number was available, interviewers asked for alternative numbers or optimal times to call back. The response rates at URI averaged 35.8% across all 4 years (range: 27.3%-40.8%) and 30.6% across 3 years at the comparison site (range: 19.5%-37.2%). We conservatively determined response rates by dividing the number of participants completing the survey by the total of (1) the number of participants completing the survey, (2) the number of participants never contacted directly (e.g., answering machines were reached; on average, 24.9% at URI and 27.0% at the comparison site), (3) participants who deferred completion at initial contact but were not subsequently reached (22.7% at URI and 18.7% at the comparison site), and (4) participants who refused (16.6% at URI and 23.8% at the comparison site).

Participants

The mean (SD) age of the initial URI sample (2004) was 19.9 (1.6) years; the mean age of the initial comparison site sample (2005) was 19.7 (1.3) years. Student samples did not differ significantly on age across the multiple years of surveys. Generally consistent with the populations from which they were drawn, the majority of participants in the 2004 URI sample were non-Hispanic white (84.3%) followed by other (6.5%), non-Hispanic black (3.9%), and Asian (2.6%). The majority of the participants in the 2005 comparison site sample were non-Hispanic white (71.5%), followed by Asian (9.3%), other (8.9%), and non-Hispanic black (6.1%). Because of the stratified sampling procedure, there was

relatively equal representation by gender and year in school across the assessment years and sites.

Survey measures

We analyzed the following measures in the current study, which were taken from a larger assessment battery. We used the same measures each year at both universities, with minor wording differences to reference the specific university.

Demographics. Participants reported their gender, race, ethnicity, age, year in school, and place of residence. For use as covariates in the analyses, we dichotomized race as 1 (non-Hispanic white) and 0 (other) and place of residence as 1 (does not live with parents) and 0 (lives with parents). For involvement in a fraternity or sorority, responses were coded as 1 (did not plan to join), 2 (planned to rush), or 3 (current member or pledge).

Alcohol use. We defined a *drink* as one shot of distilled spirits, 12 oz of beer, or 4 oz of wine (Wechsler et al., 2002). First, participants reported drinking frequency ("In a typical week, on how many days do you have at least 1 drink containing alcohol?") and quantity of consumption ("How many drinks do you have on a typical drinking day?"). We multiplied quantity and frequency to create a measure for weekly alcohol consumption (Leffingwell et al., 2007; Sher et al., 1991; Wood et al., 2001). Next, we asked participants, "In the past month, on how many days did you have 5 or more drinks within 2 hours [4 or more drinks for women]?" This definition of *heavy episodic drinking* conforms to the NIAAA (2004) definition of "*binge*" drinking—"consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours" (p. 3). Finally, we asked participants the highest number of alcoholic drinks they had consumed on one occasion in the last month. All of these measures were open-ended. We coded nondrinkers as consuming zero drinks. To create an alcohol use composite score, we computed *z* score transformations for each of these three measures and calculated a mean score.

Alcohol use at off-campus parties. An open-ended item assessed the number of alcoholic drinks that participants typically consumed in the past month during an off-campus party.

Alcohol-impaired driving. Using an open-ended response format, we asked, "In the past 30 days, how many times have you driven within two hours after having four alcoholic drinks [three alcoholic drinks for women]?" (Fairlie et al., submitted for publication). Applying an updated Widmark formula (Kraus et al., 2005), an average male student at URI (mean = 174 lb) would reach a BAC of .06% after four drinks in 2 hours, and an average female student (mean = 130 lb) would reach a BAC of .07% after three drinks in 2 hours.

Perceived enforcement of drinking and driving laws. A single item assessed the number of times participants heard

about formal efforts to increase enforcement of drinking and driving laws in the local community. Responses ranged from 1 (never) to 5 (7 or more times).

Perceptions of efforts to reduce underage access to alcohol. A single item assessed the number of times participants heard about formal efforts to reduce underage access to alcohol in the local community. Responses ranged from 1 (never) to 5 (7 or more times).

Perceptions of responsible beverage service (RBS). Two items assessed the number of times participants heard about formal efforts to implement RBS in the community or at fraternity and sorority events. Responses ranged from 1 (never) to 5 (7 or more times). Interitem correlations ranged from .26 to .40 at URI and from .27 to .30 at the comparison site across the assessment years.

Apprehension for minimum legal drinking age violation. Three items asked about the likelihood that a student younger than 21 years of age who drinks alcohol would be caught at an off-campus party, an off-campus bar or pub, or a fraternity or sorority party. Responses ranged from 1 (not at all likely) to 5 (extremely likely). Across the multiple surveys, coefficient α 's for a combined measure ranged from .62 to .69 at URI and from .62 to .71 at the comparison site.

Consequences for false ID. Three items assessed the likelihood of consequences after getting caught using a false ID to purchase alcohol off campus in the local community: confiscation of the ID, police notification, and school notification. Responses ranged from 1 (not at all likely) to 5 (extremely likely). Across the multiple surveys, coefficient α 's for a combined measure ranged from .69 to .77 at URI and from .70 to .81 at the comparison site.

Consequences for alcohol-impaired driving. Four items adapted from Fromme et al. (1997) asked: "If you were to drive while intoxicated, how likely is it that you would: hurt yourself or someone else, get caught, have an accident, and feel guilty afterwards?" Responses ranged from 1 (not at all likely) to 5 (extremely likely). Coefficient α 's for a combined measure ranged from .75 to .86 at URI and from .79 to .84 at the comparison site.

Consequences for an off-campus party. Five items assessed the likelihood of consequences for having an off-campus party: neighbors would complain, the police would show up, the renters would receive a warning, the landlord would be contacted, and students would be arrested. Responses ranged from 1 (not at all likely) to 5 (extremely likely). Coefficient α 's for a combined measure ranged from .82 to .86 at URI and from .79 to .82 at the comparison site.

Likelihood of responsible alcohol service. Three items assessed the likelihood that: a student who is noticeably intoxicated would be served alcohol at a local bar; a student younger than age 21 would be served alcohol at a local bar; and a student younger than 21 would be able to purchase alcohol at a local liquor store. Responses ranged from 1 (extremely likely) to 5 (not at all likely). One item asked how

easy it would be to find a local bar or liquor store where alcohol could be purchased without showing an ID. Responses ranged from 1 (very easy) to 5 (very difficult). Coefficient α 's for a combined measure ranged from .60 to .66 at URI and from .55 to .63 at the comparison site.

Difficulty finding an off-campus party. One item asked about the ease or difficulty of finding a party off campus at which to drink. Responses ranged from 1 (very easy) to 5 (very difficult).

Perception of students' behavior at off-campus parties. Three items assessed the likelihood that, at a local off-campus party, students would get drunk, students would get noisy, and a fight would break out. Responses ranged from 1 (not at all likely) to 5 (extremely likely). Coefficient α 's ranged from .58 to .66 at URI and from .57 to .60 at the comparison site.

Archival data: Police reports of URI student incidents

Project staff compiled Narragansett police reports regarding student incidents before the Common Ground initiative (2004-2005 academic year) and for 2 subsequent postimplementation years (2005-2006 and 2006-2007). URI's Department of Student Life verified that the reported incidents involved known student residences. The primary complaint specified was a loud party (88.1%), with estimated attendance ranging from 10 to 300 individuals. We totaled the number of cited student addresses for each academic year.

Overview of analyses

For each site, we conducted one-way between-subjects analyses of variance (ANOVAs) for 11 targeted outcome

measures, and one-way between-subjects analyses of covariance (ANCOVAs) for composite alcohol use and alcohol use at an off-campus party, with race, place of residence, and fraternity/sorority involvement as covariates. For URI, four planned contrasts were tested: Year 1 (precampaign) versus each of the three postimplementation assessments (Year 2, Year 3, and Year 4), plus a test of linear trend across the 4 years. For the comparison site, with no data collection in Year 1 (2004), the following planned contrasts were tested: Year 2 versus Year 3 and a test of linear trend across the 3 years.

Results

Sample equivalence and descriptive data

For URI, chi-square tests revealed significant differences across survey years on race and place of residence. At the comparison site, there were significant differences across survey years on place of residence and involvement in fraternities/sororities. Hence, we included race, place of residence, and fraternity/sorority involvement as covariates in cross-year analyses examining alcohol use.

Most participants reported drinking in the past year (across the years, 81.4%-84.0% at URI and 75.2%-80.4% at the comparison site). Fully 49.4% of URI students in 2004 and 44.6% of comparison site students in 2005 engaged in heavy episodic drinking. Of those who drank in the past year and drove in the past month, 20.5% of URI students in 2004 and 11.1% of comparison site students in 2005 reported driving while impaired in the past month. Tables 1 and 2 display descriptive statistics for the outcome measures at URI and at the comparison site, respectively.

TABLE 1. Means and standard deviations across assessment years at the intervention site

Item	Assessment year			
	Year 1 Mean (SD)	Year 2 Mean (SD)	Year 3 Mean (SD)	Year 4 Mean (SD)
Self-reported behaviors ^a				
Alcohol use composite	-0.01	0.04	0.02	-0.03
Alcohol use at off-campus party	3.20	3.74	3.64	3.52
Alcohol-impaired driving	0.13 (0.27)	0.13 (0.27)	0.16 (0.29)	0.12 (0.26)
Awareness of formal efforts				
Enforce drinking and driving laws	2.30 (1.28)	3.19 (1.33)	3.39 (1.38)	3.26 (1.34)
Reduce underage access	2.18 (1.27)	3.09 (1.30)	2.93 (1.34)	2.91 (1.33)
Implement responsible beverage service	1.83 (0.90)	2.34 (1.04)	2.30 (1.09)	2.15 (1.03)
Perceived likelihood of enforcement/consequences				
Apprehension for MLDA violation	2.37 (0.69)	2.49 (0.74)	2.44 (0.73)	2.56 (0.77)
Consequences for false ID	3.36 (0.81)	3.58 (0.86)	3.44 (0.81)	3.53 (0.89)
Consequences for alcohol-impaired driving	2.82 (0.97)	3.08 (0.99)	3.21 (0.86)	3.36 (0.84)
Consequences for off-campus party	2.94 (0.79)	2.94 (0.76)	2.82 (0.72)	2.85 (0.76)
Perceived alcohol availability				
Likelihood of responsible alcohol service	3.27 (0.69)	3.41 (0.67)	3.40 (0.71)	3.50 (0.71)
Difficulty finding an off-campus party	1.91 (0.88)	1.87 (0.94)	1.86 (0.90)	1.99 (0.92)
Perception of students' behavior at a party	3.72 (0.63)	3.74 (0.63)	3.59 (0.60)	3.60 (0.64)

Notes: MLDA = minimum legal drinking age; ID = identification. ^aTo adjust for race, place of residence, and fraternity/sorority involvement, least squares means are reported for the alcohol use composite and alcohol use at an off-campus party.

TABLE 2. Means and standard deviations across assessment years at the comparison site

Item	Assessment year		
	Year 2 Mean (SD)	Year 3 Mean (SD)	Year 4 Mean (SD)
Self-reported behaviors ^a			
Alcohol use composite	0.00	0.02	-0.01
Alcohol use at off-campus party	2.80	2.82	2.82
Alcohol-impaired driving	0.07 (0.20)	0.07 (0.20)	0.06 (0.19)
Awareness of formal efforts			
Enforce drinking and driving laws	2.16 (1.28)	2.28 (1.24)	2.49 (1.34)
Reduce underage access	2.36 (1.23)	2.21 (1.20)	2.28 (1.19)
Implement responsible beverage service	1.95 (0.93)	1.85 (0.87)	1.82 (0.88)
Perceived likelihood of enforcement/consequences			
Apprehension for MLDA violation	2.33 (0.71)	2.27 (0.69)	2.33 (0.77)
Consequences for false ID	3.60 (0.98)	3.35 (0.92)	3.36 (0.84)
Consequences for alcohol-impaired driving	3.09 (0.90)	3.30 (0.83)	3.38 (0.77)
Consequences for off-campus party	2.93 (0.77)	2.82 (0.71)	2.73 (0.73)
Perceived alcohol availability			
Likelihood of responsible alcohol service	3.12 (0.66)	3.17 (0.70)	3.32 (0.68)
Difficulty finding an off-campus party	1.77 (0.87)	1.72 (0.81)	1.69 (0.79)
Perception of students' behavior at a party	3.94 (0.55)	3.79 (0.57)	3.74 (0.57)

Notes: Data were not collected in Year 1 at the comparison site. MLDA = minimum legal drinking age; ID = identification. ^aTo adjust for race, place of residence, and fraternity/sorority involvement, least squares means are reported for the alcohol use composite and alcohol use at an off-campus party.

Primary analyses

Alcohol use composite. For URI, the ANCOVA was significant ($F = 33.47$, 6/2,049 df, $p < .0001$). Each of the three covariates was significant (p 's $< .0001$), but survey year was not. Parallel results were observed for the comparison site ($F = 23.68$, 5/1,532 df, $p < .0001$). Each of the three covariates was significant (p 's $< .01$), but again survey year was not.

Alcohol use at an off-campus party. The URI ANCOVA was significant ($F = 24.20$, 6/1,996 df, $p < .0001$). All three covariates were significant (p 's $< .0001$), but year was not. The comparison site ANCOVA was significant ($F = 23.87$, 5/1,472 df, $p < .0001$). Race and fraternity/sorority involvement were associated with alcohol use at an off-campus party (p 's $< .0001$), but again year was not.

Alcohol-impaired driving. The analysis included students who reported drinking in the past year and driving in the past month. We transformed the data (1 – inverse) to reduce skewness and kurtosis. Year on alcohol-impaired driving was not significant for either URI ($F = 1.69$, 3/1,562 df, $p = .17$) or the comparison site ($F = 0.11$, 2/1,008 df, $p = .90$).

Awareness of formal alcohol-control efforts. For URI, we conducted three one-way between-subjects ANOVAs to examine awareness of formal alcohol-control efforts. Year was significant in each case: efforts to enforce drinking and driving laws ($F = 71.13$, 3/2,060 df, $p < .0001$), efforts to reduce underage access to alcohol ($F = 49.65$, 3/2,055 df, $p < .0001$), and efforts to implement RBS ($F = 25.67$, 3/2,060 df, $p < .0001$). As shown in Table 3, tests of linear trend revealed precampaign to postcampaign increases in awareness. Using the square root of the mean of the variances (Cohen, 1988), we computed d -indices that compared precampaign

awareness levels with each of the 3 subsequent years. For enforcement of drinking and driving laws, comparisons for Year 1 versus Year 2 yielded $d = 0.68$; Year 1 versus Year 3 = 0.82; and Year 1 versus Year 4 = 0.73. For reduction in underage access efforts, we observed d 's = 0.71, 0.58, and 0.57 in comparisons of Year 1 with Years 2, 3, and 4, respectively. Awareness of RBS efforts yielded d 's = 0.52, 0.46, and 0.32 in comparisons of Year 1 with Years 2, 3, and 4, respectively.

For the comparison site, the effect of year on the awareness of formal efforts to enforce drinking and driving laws was significant ($F = 8.78$, 2/1,546 df, $p < .001$). As shown in Table 3, planned contrasts revealed that over time students' awareness of efforts to enforce drinking and driving laws increased. The effect of year on the awareness of formal efforts to implement RBS also was significant ($F = 3.08$, 2/1,552 df, $p < .05$). Planned contrasts revealed that awareness of formal efforts to implement RBS had a significant downward trend at the comparison site, in contrast with the upward trend observed at the treatment site. Year did not have a significant effect on the students' awareness of formal efforts to reduce underage access to alcohol ($F = 2.27$, 2/1,550 df, $p = .10$). For the comparison site, we averaged d -indices comparing the initial survey (Year 2, 2005) with each of the 2 subsequent years. For awareness of enforcement of drinking and driving efforts, the average $d = 0.17$. For both awareness of RBS implementation and efforts to reduce underage access, average d -indices were -0.13 and -0.10, respectively, indicating downward trends.

Apprehension for minimum legal drinking age violation. For URI, a one-way between-subjects ANOVA showed significant differences by year ($F = 5.83$, 3/2,056 df, $p < .001$). As

TABLE 3. Planned contrast *F* values for analyses of variance at the intervention and comparison sites^a

Source	Intervention site				Comparison site	
	Linear trend	Years 1 vs 2	Years 1 vs 3	Years 1 vs 4	Linear trend	Years 2 vs 3
Awareness of formal efforts						
Enforce drinking and driving laws	136.95 [§]	115.33 [§]	171.25 [§]	133.47 [§]	17.17 [§]	2.14
Reduce underage access	62.20 [§]	124.78 [§]	85.20 [§]	80.19 [§]	—	—
Implement responsible beverage service	19.63 [§]	62.71 [§]	52.76 [§]	23.86 [§]	5.65*	3.17
Likelihood of enforcement/consequences						
Apprehension for MLDA violation	11.77 [‡]	6.73 [‡]	1.99	16.06 [§]	—	—
Consequences: False ID	4.29*	16.49 [§]	2.09	9.30 [†]	18.73 [§]	19.47 [§]
Consequences: Alcohol-impaired driving	76.42 [§]	17.48 [§]	37.64 [§]	73.29 [§]	25.14 [§]	13.62 [‡]
Consequences: Off-campus party	6.68 [†]	0.00	6.30*	3.51	18.73 [§]	5.42*
Alcohol availability						
Likelihood of responsible alcohol service	25.51 [§]	10.58 [†]	9.69 [†]	28.82 [§]	21.86 [§]	1.44
Difficulty finding an off-campus party	—	—	—	—	—	—
Perception of students' behavior at a party	16.81 [§]	0.20	11.23 [‡]	9.36 [†]	33.89 [§]	18.21 [§]

Notes: The tests of linear trend and each of the year-to-year contrasts had one degree of freedom. MLDA = minimum legal drinking age; ID = identification.

^aResults for the planned contrasts are only presented if the effect of year was significant in the overall *F* test.

**p* < .05; [†]*p* < .01; [‡]*p* < .001; [§]*p* < .0001.

shown in Table 3, there was a significant test of linear trend, indicating that the perceived likelihood of apprehension increased precampaign to postcampaign implementation. Computed *d*-indices indicated modest intervention effects from Year 1 to Year 2 (*d* = 0.17) and from Year 1 to Year 3 (*d* = 0.09), and a slight increase in effect size in comparing Year 1 with Year 4 (*d* = 0.25). In contrast, at the comparison site, year did not have a significant effect (*F* = 1.08, 2/1,551 df, *p* = .34). The average *d* = -0.05 when comparing the initial survey (Year 2, 2005) with the 2 subsequent years.

Consequences for false ID. At URI, a one-way between-subjects ANOVA showed significant differences by year (*F* = 6.39, 3/2,041 df, *p* < .001). As shown in Table 3, the linear trend demonstrated significant precampaign to postcampaign implementation increases. Computed effect sizes demonstrated moderate intervention effects for Year 1 to Year 2 (*d* = 0.26) and for Year 1 to Year 4 (*d* = 0.19), with a smaller effect for Year 1 to Year 3 (*d* = 0.09). At the comparison site, year had a significant effect (*F* = 12.89, 2/1,524 df, *p* < .0001). In contrast with the increasing trend at the intervention site, there was a significant downward trend at the comparison site (average *d* = -0.27).

Consequences for alcohol-impaired driving. At URI, a one-way between-subjects ANOVA showed significant differences by year (*F* = 26.13, 3/1,701 df, *p* < .0001). The perceived likelihood of consequences for alcohol-impaired driving increased precampaign to postcampaign. The Year 1 to Year 2 effect size was modest (*d* = 0.27) but increased for Year 3 (*d* = 0.42) and Year 4 (*d* = 0.60). At the comparison site, year also had a significant effect (*F* = 13.67, 2/1,217 df, *p* < .0001). There was a significant upward trend, but the effect sizes were relatively modest (average *d* = 0.30).

Consequences for an off-campus party. At URI, a one-way between-subjects ANOVA showed significant differences by year (*F* = 3.43, 3/2,052 df, *p* < .05). Contrary to expecta-

tions, the perceived consequences for having an off-campus party had a significant downward linear trend. The effect size was zero for the Year 1 to Year 2 comparison and then decreased when comparing Year 1 with Years 3 and 4 (*d*'s = -0.16 and -0.11, respectively). At the comparison site, year also had a significant effect (*F* = 9.40, 2/1,550 df, *p* < .0001); again, there was a significant downward trend. The average effect size at the comparison site (average *d* = -0.20) was somewhat larger than the effect sizes at URI.

Likelihood of responsible alcohol service. At URI, the effect of year was significant (*F* = 9.77, 3/2,056 df, *p* < .0001). A significant linear trend indicated that the perceived likelihood of RBS increased over time. Effect sizes were modest when comparing Year 1 with Years 2 and 3 (*d*'s = 0.21 and 0.19, respectively) and increased for the Year 4 comparison (*d* = 0.33). At the comparison site, year also had a significant effect (*F* = 11.68, 2/1,546 df, *p* < .0001). Again, a significant linear trend at the comparison site indicated that the likelihood of RBS increased over the 3 assessment years, with modest effect sizes (average *d* = 0.18).

Difficulty finding an off-campus party. One-way between-subjects ANOVAs revealed no significant differences by year at both URI (*F* = 1.89, 3/1,702 df, *p* = .13) and the comparison site (*F* = 0.95, 2/1,219 df, *p* = .39). Effect sizes were near zero for all three comparisons at URI and, on average, slightly negative at the comparison site.

Perceptions of students' behavior at off-campus parties. At URI, the effect of year was significant (*F* = 7.96, 3/2,055 df, *p* < .0001). The perception that students were likely to get drunk, noisy, or into a fight had a significant downward linear trend; over time, students perceived these behaviors as less likely to occur. The effect size comparing Year 1 with Year 2 was near zero (*d* = 0.03) but increased in the comparison of Year 1 with Year 3 (*d* = -0.21) and with Year 4 (*d* = -0.19). At the comparison site, year also had a significant

effect ($F = 18.31$, $2/1,552$ df, $p < .0001$). There was a significant downward trend at the comparison site with an average $d = -0.31$.

Archival data: Police reports of URI student incidents

Trends in police reports of student incidents in Narragansett were examined by comparing reports from before the implementation of the initiatives and communications campaign (2004-2005 academic year) with those from the 2 subsequent academic years. From 2004-2005 to 2006-2007, there was a 27.1% decrease in student-specific police complaints, with a generally linear decrease: 15.1% from 2004-2005 to 2005-2006, and 14.2% from 2005-2006 to 2006-2007.

Discussion

Implementing and publicizing EM initiatives significantly increased students' awareness of formal alcohol-control efforts, perceived likelihood of enforcement, and perceptions of responsible beverage service while decreasing perceptions of student misbehavior at off-campus parties. Archival data indicated substantial decreases in complaints to local police regarding student disturbances in the community over the course of the initiative. In contrast, we observed no intervention effects on students' self-reported alcohol use or alcohol-impaired driving.

Consistent with Common Ground's focus, across multiple years of the study we saw robust preimplementation to postimplementation increases in student awareness of formal efforts to enforce DUI and the minimum legal drinking age and to promote RBS. Effect size estimates at URI were generally in the medium ($d \geq 0.50$) to large ($d \geq 0.80$) range (Cohen, 1988), in contrast with comparison site estimates that ranged from modest (e.g., $d = 0.17$) to negative. These findings are consistent with intermediate outcomes reported for the AMOD program by Weitzman et al. (2004).

The next largest effect size at URI was observed for perceived consequences of alcohol-impaired driving, which exceeded Cohen's (1988) medium effect size level by Year 4. These findings replicate those of Clapp et al. (2005), who observed significant intervention effects for perceived risk of DUI arrest. Significant but somewhat more modest increases at the comparison site were likely the result of prevention efforts taking place there. These efforts were monitored at the comparison site over the course of the project. For example, the year before initial data collection at the comparison site, a campus-community coalition was formed, with a focus on ordinances to hold landlords accountable for rental property conditions and the hiring of staff to check and license rental properties. During the project, the major prevention initiative at the comparison site addressed a longstanding, large, unsanctioned annual event where underage and abusive

drinking occurred. A "Safe Ride" program—based on the same one that inspired URI's efforts—formed in 2006 and continues to operate.

Significant intervention effects for perceptions of the likelihood of RBS practices were modest. The largest effect occurred from Year 1 to Year 4 following implementation of cooperative tavern and liquor store agreements in a second town and extensive publicity about both the agreements and the revised state RBS law. Lesser increases were observed on this outcome at the comparison site.

We observed small but reliable precampaign to postcampaign increases in the perceived likelihood of apprehension for violating the minimum legal drinking age and using a false ID at URI, compared with nonsignificant effects and decreases at the comparison site. At both sites, perceived difficulty in finding an off-campus party did not differ by year, whereas perceptions of students' unruly behaviors at off-campus parties decreased.

Consistent with previous campus-community coalition research (Gebhardt et al., 2000), archival police data indicated a monotonic and fairly substantial (27%) decrease in complaints about student conduct over the course of the study. Notably, beyond the media campaign, there was extensive news coverage of increased police enforcement at off-campus parties and Narragansett's controversial "sticker policy."

As noted, we did not observe changes in students' self-reported alcohol use or alcohol-impaired driving at URI or at the comparison site. Given the lack of effects for the targeted outcome, alcohol-impaired driving, we used G*Power3 to examine the statistical power for detecting the observed effect (Erdfelder et al., 1996; Faul et al., 2007). We were underpowered (power = .43) to detect the effect observed here (effect size $f = .06$). However, if the intervention had achieved a small effect size ($f = .10$), we would have been able to detect this effect with the current sample size (power = .93). The lack of significant effects on self-reported behaviors is in contrast with a small body of EM research with college students. Weitzman et al. (2004) reported no overall AMOD intervention effects for alcohol consumption, alcohol-related consequences, or secondhand effects but did observe intervention effects for these outcomes when schools were disaggregated into low and high implementation sites. Clapp et al. (2005) used sobriety checkpoints and roving DUI patrols, supported by social marketing and media advocacy campaigns, to reduce alcohol-impaired driving. After controlling for several covariates, they observed significant decreases in self-reported DUI in the past year at the intervention site but no changes at a comparison site.

It should be noted that Clapp et al. (2005) queried participants on the frequency of DUI in the past year—a technique that is subject to interpretational bias—whereas the current study used a self-report measure that incorporates crucial factors such as gender, body weight, and the amount and

duration of drinking. We believe that the latter approach, although still limited as a self-report measure, yields a more accurate assessment of DUI (Fairlie et al., submitted for publication). Regarding sobriety checkpoints, Rhode Island is one of 11 states whose courts have ruled this enforcement strategy to be unconstitutional. Therefore, this effective EM strategy (Fell et al., 2003) could not be implemented as part of Common Ground.

Study limitations

Consistent with previous EM research (Clapp et al., 2005; Weitzman et al., 2004), the current study design precludes causal inferences about intervention effects. The comparison site was chosen based on important shared features with URI (e.g., region, size, public governance). Even so, the schools differ in many respects. For example, URI does not have an event comparable to the large-scale unsanctioned annual event at the comparison site where underage drinking occurs, and student residents were somewhat less intermingled with year-round residents at the comparison site. Moreover, in an era of heightened awareness of college alcohol problems, most campuses are actively engaged in multiple preventive intervention efforts. Clearly, studies with random assignment of multiple sites to intervention and comparison conditions are advantageous and are an important means to advance current knowledge. Such trials are often prohibitively expensive, and, therefore, well-conducted case studies take on added importance.

The inclusion of only two campuses in staggered fashion also prohibited analyses of outcomes using statistical approaches that account for the nesting of individuals within study sites (e.g., Murray, 1998). We sought to address the confounding of intervention and site by stratifying our survey samples, including covariates for the alcohol-outcome analyses, and examining intermediate outcomes across multiple years. Future research that can account for the hierarchical structure of cross-site survey data is needed.

Our telephone survey response rates were modest but comparable to other recent work (Clapp et al., 2005) and should be considered in the context of widespread declines in response rates for all types of surveys (Tourangeau, 2004). Although it is often assumed that lower response rates indicate greater bias, this is not necessarily the case if the individuals who respond do not differ significantly from the individuals who do not respond (Curtin et al., 2000; Keeter et al., 2000). Unfortunately, it is not typically possible to determine whether a nonresponse bias is present (Keeter et al., 2000), and thus we were unable to do so in the current study. However, given explicit attempts in our recruitment procedures, we were able to avoid certain potentially biasing issues that may occur when cellular phone numbers and unlisted numbers are not sought or available. In the future, merging telephone survey approaches with Web surveys

that can statistically compensate for "undercoverage" of particular populations and low response rates holds promise (Couper, 2000).

Administration of a timeline followback calendar would have provided more information on alcohol consumption, but this step could not be done by telephone. Also, we wanted to examine DUI arrest data among college-age individuals in towns adjacent to URI for comparison with similar statewide data. Unfortunately, the data from local police departments were unsuitable, because they often differed dramatically from Uniform Crime Report data reported to state authorities by the same departments. Future research using archival data would profit from pretrial attention to the refinement of record-keeping and reporting protocols.

Conclusions and implications

The current study makes important contributions to the small but growing body of literature on EM approaches in college settings. The periodic intercept interviews that we conducted (not reported here) showed that the media campaign's phased design was quite effective in limiting student reaction to environmental initiatives. The increased awareness of formal alcohol-control efforts that we saw suggests that our media campaign and EM initiatives were successful in altering students' perceptions of the alcohol environment and could serve as a model for future efforts in this regard. Finally, consistent with previous research (Gebhardt et al., 2000), the substantial decreases in student-related noise complaints support the utility of our approach for positively impacting quality-of-life outcomes in off-campus neighborhoods.

Multiple potential explanations exist for the lack of observed intervention effects on student reports of drinking and driving. We tentatively suggest that our findings, in consideration of those of Clapp et al. (2005), point to the potential importance of sobriety checkpoints as an important component of EM approaches in college populations. As Toomey et al. (2007) conclude, although there is evidence supporting the utility of multiple-component EM approaches in college populations, currently it is not known which particular combination of approaches will yield optimal outcomes. One potential avenue for progress on this front would be to contrast EM approaches that include sobriety checkpoints with those that do not.

An additional implication of this study relates to the means by which EM initiatives are implemented. As noted, our original intent was to develop coalitional capacity using an established model (Florin et al., 2000) and then to work with the coalition to select and implement EM initiatives. Ultimately, because of both time constraints and the somewhat acrimonious nature of town-gown relations, we opted to work more directly with specific organizations, most notably police departments and alcohol retailers. Although there is

some evidence for the effectiveness of coalition-delivered EM interventions, outcomes have been shown to vary as a function of the degree of implementation (Weitzman et al., 2004). Accordingly, prevention specialists should be aware that multiple avenues for EM intervention delivery exist (see also Wagenaar et al., 1999).

Acknowledgments

We gratefully acknowledge the assistance of Paul Florin, Robert Laforge, John Stevenson, the Common Ground project staff, and members of the Narragansett-URI Coalition for their assistance with this project.

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