

Declining Negative Consequences Related to Alcohol Misuse Among Students Exposed to a Social Norms Marketing Intervention on a College Campus

James Turner, MD; H. Wesley Perkins, PhD; Jennifer Bauerle, PhD

Abstract. Objective: The authors examined whether alcohol-related negative consequences decreased among students exposed to an intervention. **Participants:** Beginning in 1999, approximately 2,500 randomly selected undergraduates from a 4-year US university annually participated in a Web-based survey over 6 years. **Methods:** The educational intervention used social norms initiatives. Main outcome measures included recall of intervention, estimated blood alcohol content (eBAC) when drinking, and 10 negative consequences from alcohol within the past year. **Results:** First-year students recalling exposure had lower odds of negative consequences (odds ratio [OR] = 0.78, 95% confidence interval [CI] = 0.64–0.95) and of having an eBAC higher than .08 (OR = 0.76, 95% CI = 0.62–0.92). Over the 6 study years, the odds among all participants of experiencing (a) none of 10 alcohol consequences nearly doubled (OR = 2.13, 95% CI = 1.82–2.49) and (b) multiple consequences decreased by more than half (OR = 0.43, 95% CI = 0.36–0.50). **Conclusions:** These findings have important implications for US colleges and universities engaged in the reduction of harm associated with alcohol misuse.

Keywords: alcohol, college health, social norms

Alcohol abuse among college students results in numerous social, academic, and health-related consequences on college campuses and has been a significant concern for many years. Despite publicity, interventions, and inestimable millions of dollars spent to curb college drinking, prevalence rates of high-risk drinking and related consequences have changed little since 1993.^{1,2}

Drs Turner and Bauerle are with the National Social Norms Institute at the University of Virginia, Charlottesville. Dr Turner is also executive director of the Department of Student Health at the University of Virginia. Dr Perkins is with the Department of Anthropology and Sociology at Hobart and William Smith Colleges in Geneva, NY.

Copyright © 2008 Heldref Publications

Like many other institutions, our university has remained concerned about alcohol-related consequences. Since the mid-1980s, administrators tried many initiatives, including enhanced enforcement, elimination of community-wide celebratory drinking events, implementation of parental notification, deferred Greek rush, restaurant and bar server training, and a multitude of alcohol education events for students. Throughout the '90s, unpublished student surveys and anecdotal observation by medical professionals, student affairs colleagues, and police demonstrated little if any change to the vexing problem of repeated and serious consequences related to students' heavy episodic drinking.

What became clear from campus surveys, focus groups, and students' anecdotal feedback was that several misperceptions regarding alcohol use and misuse existed on this campus. Students consistently overestimated the general student population's amount and frequency of alcohol consumption, a finding that is consistent with results observed nationally.^{3,4} In addition, students were concerned about accessing medical care for themselves or friends when alcohol had contributed to illness or injury, for fear that medical staff would notify university officials or police—or worse, parents. Last, students underestimated the degree to which fellow students practiced protective behaviors (eg, not allowing an intoxicated friend to drive, not leaving a passed out friend alone).

A body of evidence confirms that correcting misperceptions and promoting responsible behavior in the spirit of personal well-being can result in safer behaviors by students.^{4–7} Using a variety of marketing techniques, misperceptions about both actual campus behaviors (descriptive norms) and widely supported desirable behaviors (injunctive norms) can be corrected, thus encouraging safety and responsibility.⁸

The university embarked on renewed efforts to reduce harm related to alcohol abuse and initiated a social norms marketing campaign in fall 1999, initially targeting first-year students and then expanding the program to include all undergraduates in fall 2002. The campaign initially focused on correcting misperceptions about quantity and frequency of consumption of alcohol for first-year students, and when it was expanded to all undergraduates, it included information about practicing protective behaviors and the fact that such practices were normative among peers. During this timeframe, no significant new institutional, community, or statewide programs, policies, or laws were implemented.

In this study, we assessed yearly exposure to alcohol interventions, alcohol consumption (estimated blood alcohol content [eBAC]), and self-reported negative consequences of drinking at a large public university during a time period when students were being increasingly exposed to a social norms intervention.

METHODS

The university’s investigational review board reviewed and approved the protocol for the distribution and analysis of students’ survey data.

Intervention

The alcohol intervention evolved over the first 3 years, and we modified it to reach all undergraduates as well as certain high-risk groups (represented schematically in Figure 1).

In fall 1999, we introduced a social norms campaign with a targeted intervention for first-year students through a monthly series of highly visible posters in the first-year residence halls. The posters accentuated the healthy normative behaviors that a majority of students reported on prior surveys at this university (data not reported) and corrected existing overestimations about the quantity and frequency of heavy drinking among students. Thus, each fall, throughout the entire study period, the first-year students received a priming inoculation of social norms through this program.

In fall 2002, we added a campuswide, or general, intervention that would reach all undergraduate students. Aside from highlighting the campus alcohol consumption norms mentioned previously, we provided normative information regarding protective behaviors, including not leaving friends who had been drinking alone with strangers, intervening to stop friends from drinking and driving, asking friends to slow down if they are drinking excessively, planning on a designated driver or alternative transportation, and eating beforehand if they chose to drink. All messages were delivered via ads and articles in the student newspaper, campus posters, and Web postings. Both professional and student health educators conducted presentations in residence halls, Greek residences, and classrooms. These served as secondary messages that boosted the first-year priming dose.

Certain elements of the university’s educational messages had not changed in several years prior to the start of this social norms intervention, and these other

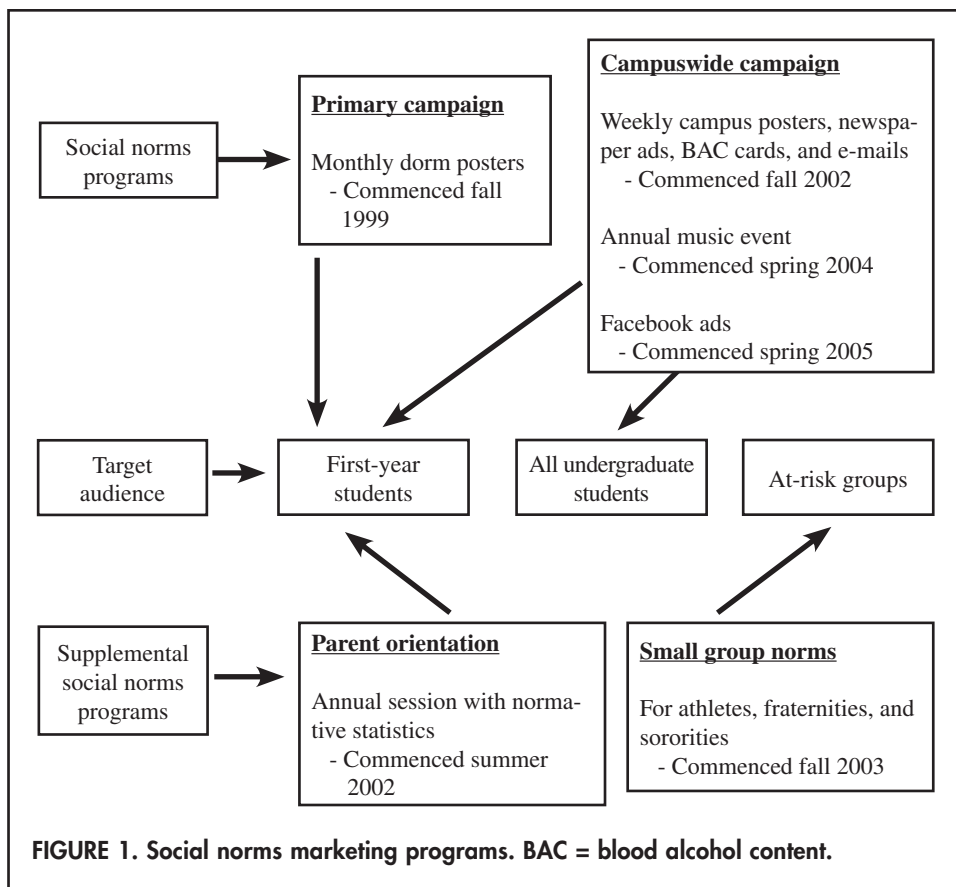


FIGURE 1. Social norms marketing programs. BAC = blood alcohol content.

messages remained constant throughout the 6-year campaign. These messages included information that reemphasized university policies regarding underage possession as well as parental notification for serious or frequent violations of campus alcohol policies.

In addition to the programs described previously, the university initiated targeted interventions for 2 other high-risk groups. First, the university received 2 grants (US Department of Education Grant S184H010094; National Institute on Alcohol Abuse and Alcoholism Grant 5 U18 AA015617-02) that funded the development and assessment of a small-group social norms project for fraternities and sororities. Evaluation of these data is ongoing, so results are not yet available. Starting in fall 2003, participating chapters learned about their chapter-specific alcohol norms and the norms of the general undergraduate population. In addition, a small-group social norms program with athletic teams was started in the same year, promoting the responsible behaviors of the majority that discourage hazing and ritualistic drinking activities. A total of 13 teams completed the programs through spring 2006, but we did not include a formal evaluation component in this intervention.

Last, starting in 2003 and continuing throughout the rest of the study period, all summer orientation programs for parents of incoming first-year students included extensive descriptive and injunctive social norms information about alcohol use and BAC. Seventy-eight percent of sessions were attended by at least 1 parent.⁹

In summary, we began to introduce social norms initiatives in the fall of 1999 with first-year students and then incrementally expanded to target audiences thereafter. In 2002, the campaign encompassed all undergraduates, and in 2003, athletes and members of Greek organizations received focused interventions. The combination of initiatives over time provided an increasingly intensive exposure to accurate norms for virtually the entire undergraduate student body.

When systematic assessment of all undergraduates began in 2001, 2 entering class cohorts (then first- and second-year students) had been exposed to messages only as first-year students. By spring 2003, all 4 class years on campus had received both the year of priming norms messages (as freshmen) and the subsequent campuswide booster messages. The campuswide intervention continued annually thereafter, so that by spring 2006, each cohort of undergraduates had been exposed to both the primary message in their first year and the campuswide campaign each year they were enrolled, from the freshman year onward. Student athletes and Greek members from 2003 forward also received targeted interventions providing additional exposure intensity.

Social norms theory highlights the importance of achieving a high dosage of accurate information about norms to reduce misperceptions and, in turn, reduce problem behavior.¹⁰ Thus, the predicted outcome would be a correlation of exposure to normative messages with a decline in alcohol consumption and alcohol-related consequences over the 6-year assessment period.

Data Collection

From spring 2001 through spring 2006, we administered a Web-based survey. We electronically received e-mail addresses for the entire sample from the registrar's office and selected a random sample of university undergraduates in a sampling frame that stratified for sex and class year. From 2001 to 2006, women generally composed 55% of the undergraduate population. In prior surveys of this type at this institution, men have tended to respond less frequently than have women (data not provided). To achieve a higher percentage of men among respondents and therefore provide a more accurate representation of the university, we oversampled men (55% of sample was male). This yielded a range of 46% to 52% of men among the respondents over the 6 years. Similarly, we oversampled first-year students to provide a relatively large database for examining patterns of alcohol use in the entering class each year, for subsequent research (not reported here).

We took several steps to assure respondents' anonymity. We collected no identifying information as part of the survey, and participants were free to skip any question they were uncomfortable answering. In addition, we did not track which Internet browser participants used or from which machine they submitted the information. Thus, there was no electronic trail that would associate a particular set of responses to a particular machine or individual. After respondents completed the surveys, the data were transferred to a database housed in a secured IT office and maintained by professional staff members.

The method of student notification and recruitment has been previously described.¹¹ To encourage students to participate in the survey, we followed the Dillman Method.¹² First, we mailed potential participants an introduction letter and enclosed a Jefferson \$2 bill as incentive for participation. Three days later, we sent each potential participant an e-mail message. The e-mail referenced the introductory letter and requested that students participate in the Web site survey. One week later, we mailed each potential participant a postcard reminder. We sent a final e-mail 1 week later with a similar reminder.

Statistical Analysis

Using logistic regression procedures (SPSS binary logistic regression; SPSS Inc, Chicago, IL), we computed odds ratios (ORs) and significance tests predicting no reported consequences and predicting multiple (2 or more) consequences of drinking as dependent variables. We entered survey time period as an independent categorical variable, with the baseline year of 2001 providing the comparison category for subsequent years. We also entered sex, race (white/minority), citizenship (US/international status), and class year (with first-year students as the comparison category) as independent control variables to extract any effects of demographic variation in these variables across years.

Measures

Included in the survey were several questions of specific interest for evaluating trends in student alcohol misuse. We

included only those students who consumed alcohol within the past year in the analyses. Students responded yes or no to a range of possible negative outcomes they may have experienced as a result of drinking if they had consumed any alcohol within the past 12 months. We examined 10 items that we had assessed each year in the survey and that represented potentially serious negative experiences produced by students' own drinking behavior. Specifically, the potential consequences covered academic problems (missed class or performed poorly on a test or project because of drinking), sexual risks (had unprotected sex because of drinking, had been taken advantage of sexually when drinking, or had taken advantage of someone sexually when drinking), damaging property because of drinking, fighting because of drinking, being injured or hurt because of drinking, driving under the influence of alcohol, and trouble with police because of drinking. We created 2 composite dichotomous measures of these negative consequences: (1) whether a student had experienced any of these problems because of drinking in the past 12 months and (2) whether a student had experienced multiple types of consequences (2 or more of the 10 consequences listed previously) during this time period.

In addition, questions queried about the number of times a respondent recalled first-year and campuswide social norms messages (eg, never, once, twice or more) on campus. Last, from 2003 to 2006, we collected data on the standard number of drinks the respondent usually consumed while drinking, thus permitting calculation of eBAC with the following equation:

$$\text{eBAC} = [(\text{consumption}/2) \times (\text{GC}/\text{weight})] - (0.016 \times \text{hours}),$$

where consumption equals the number of drinks in the average drinking session, hours equals the hours over which drinking usually occurs, weight equals weight in pounds, and GC equals gender constant: 9.0 for women and 7.5 for men.¹³

RESULTS

Table 1 presents the survey respondent characteristics for each year of data collection. In 2001, 1,647 students responded to the survey for a response rate of 34%. Each year thereafter, about half of all sampled students responded, providing samples ranging in size from 2,388 to 3,047. We removed from the data set participants who failed to answer more than the initial demographic questions or who indicated they were graduate students, considering them nonresponders. Sex distribution varied slightly across years, with about half of all respondents being female each year. (Fifty-four percent to 55% of students attending the institution were female each year.) Representation of minority races in the samples ranged between 21% and 28%. Minority races in the undergraduate population overall accounted for 29% of the student body in 2001 and increased to 35% by 2006. International students made up 3% to 4% of the sample most years, although that percentage ranged from a low of 1% in 2003 to a high of 8% in 2001. First-year students were overrepresented each year, representing between 42% and 50% of the sample. This large first-year contingent is not a reflection of attrition (which is low at this

TABLE 1. Undergraduate Survey Demographic Characteristics and Campaign Exposure, in Percentages (2001–2006)

Characteristic	2001	2002	2003	2004	2005	2006
<i>n</i>	1,647	3,047	2,405	2,638	2,562	2,388
Responded	34	53	53	52	50	47
Female	54	48	51	51	50	50
Minority race	28	23	21	25	25	26
International student	8	4	1	4	3	4
First year	42	48	46	47	48	50
Second year	24	18	18	19	18	17
Third year	20	17	17	16	16	16
Fourth or fifth year	14	17	19	18	18	17
Younger than 21 years	75	75	74	74	76	76
Older than 25 years	1	1	2	1	1	1
First-year students exposed to first-year primary campaign 2 or more times ^a	89	92	97	97	96	95
Students who saw campuswide norms message at least once ^a	NA ^b	NA ^b	70	67	77	78
Students who saw campuswide norms message 2 or more times ^a	NA ^b	NA ^b	56	51	65	63

Note. Data on respondents represents the percentage of the entire student body that responded to the survey.

^aExcludes students aged 26 and older.

^bCampuswide campaign did not commence until the 2002–2003 academic year.

institution) but rather the result of our previously described intentional oversampling. The proportions of other class years in the samples ranged between 14% and 24%. Last, the age distribution was consistent each year; about three-fourths of the sample were younger than age 21, and less than 2% were older than age 25. Because our intention was to examine trends in negative consequences of drinking among traditional-aged students, we excluded the few respondents aged older than 25 from subsequent analyses.

About three-fourths (73% to 77%) of the sample of students aged younger than 26 reported past-year alcohol use each year, with the exception of 2003, when a slightly higher 82% responded. (As noted, few international students were represented in the sample in 2003, and international students in this population abstained at higher rates, perhaps explaining the higher response to these questions in that year.) In general, the samples obtained each year were similar; however, there was enough variation across years in sex, race, international status, and class year to warrant the use of multivariate procedures to control for these demographic factors, which are often associated with the negative consequences of alcohol use.

Our initial assessment concerned exposure levels (see Table 1) achieved by the primary intervention. In each survey year (2001–2006), a majority of first-year students (89% to 97%) recalled having seen the social norms posters targeting first-year students 2 or more times. For the campuswide campaign, variable proportions (56% to 78%) of undergraduates recalled seeing normative alcohol messages once or more from 2003 to 2006.

Next, among those who reported drinking in the past year (73% to 82% in each survey year), we assessed the degree to which alcohol-related negative consequences changed throughout the 6 years of the intervention. Table 2 reports the percentage of respondents who experienced no consequences, the percentage who experienced multiple (2 or more) consequences, and the prevalence rates for 10 negative consequences of drinking. The proportion of students reporting no consequences increased substantially, from 33% in 2001 to 51% in 2006, whereas the prevalence of multiple consequences declined from 44% to 26% in the same time frame.

To test the significance of these differences across years and simultaneously control for any variation in demographic characteristics each year, we conducted logistic regression analyses, entering each year as an independent variable (comparing each to the baseline 2001 year), along with demographic variables to predict no consequences and multiple consequences (see Table 3). Compared with 2001, the odds of experiencing none of the 10 consequences of drinking in 2002 increased by almost one-third (odds ratio [OR] = 1.30). The odds of experiencing no consequences increased steadily each year thereafter. In the most recent year (2006), the likelihood of not experiencing a consequence of drinking had more than doubled (OR = 2.13) compared with the first year. The odds of experiencing multiple types of consequences, in contrast, declined each subsequent year when compared with 2001. In the year after the baseline year (2002), multiple consequences decreased by 20% (OR = 0.80). Reductions in multiple consequences

TABLE 2. Prevalence Rates for No Consequences, Multiple Consequences (2 or more), and Specific Negative Consequences of Drinking Among Undergraduates Consuming Alcohol in Past 12 Months (2001–2006), in Percentages

Characteristic	2001	2002	2003	2004	2005	2006
No. of students drinking in past 12 months	1,219	2,178	1,891	1,897	1,936	1,723
Experienced no consequences	33	38	44	46	48	51
Experienced multiple consequences	44	40	36	34	31	26
Missed class because of drinking	47	42	38	36	34	31
Performed poorly on test or project because of drinking	16	16	15	12	11	8
Had unprotected sex because of drinking	15	13	12	13	11	10
Had been taken advantage of sexually when drinking	12	11	10	8	8	12
Took advantage of someone sexually when drinking	4	4	3	4	2	2
Had been injured or hurt because of drinking	25	26	23	11	12	11
Damaged property because of drinking	17	16	13	18	16	12
Got into a fight because of drinking	9	8	8	7	7	5
Drove under the influence of alcohol	27	25	19	17	16	15
Got in trouble with police because of drinking	9	8	6	7	7	7

Note. We excluded students aged 26 and older.

TABLE 3. Logistic Regression Odds Ratios (ORs, with 95% Confidence Intervals [CIs]) for Survey Year and Student Demographic Characteristics Predicting No Negative Consequences and Multiple Types of Consequences of Drinking in Past 12 Months

Independent variable	No consequences		Multiple types of consequences	
	OR	95% CI	OR	95% CI
Survey year (compared with 2001 baseline year)				
2002	1.30***	1.12–1.51	0.80**	0.69–0.93
2003	1.62***	1.39–1.89	0.67***	0.59–0.78
2004	1.78***	1.53–2.07	0.60***	0.52–0.70
2005	1.90***	1.64–2.21	0.55***	0.47–0.64
2006	2.13***	1.82–2.49	0.43***	0.36–0.50
Demographic				
Sex	0.65***	0.60–0.70	1.82***	1.68–1.98
Race (white compared with other racial identification)	0.69***	0.62–0.76	1.58***	1.42–1.76
International student (compared with US student)	1.27*	1.02–1.57	0.62***	0.48–0.80
Class year (compared with first-year student baseline)				
Second	0.96	0.86–1.07	0.98	0.87–1.10
Third	0.87*	0.78–0.97	1.07	0.96–1.20
Fourth or fifth	0.90	0.81–1.00	1.04	0.93–1.16

* $p < .05$. ** $p < .01$. *** $p < .001$.

continued each year thereafter. By 2006, the likelihood of experiencing multiple consequences had decreased by more than half (OR = 0.43). Thus, controlling for demographic variation in samples, the chance of avoiding all consequences of drinking steadily improved over time, and the chance of students drinking in the most problematic ways (producing multiple types of consequences for themselves and others) steadily declined.

Men, white students, and US residents were less likely to avoid all consequences and more likely to experience multiple types of negative consequences when consuming alcohol. Class year provided relatively little appreciable effect overall.

We tested the observed prevalence rates of specific consequences for statistical significance while controlling for demographic variations across years (see Table 2). We computed ORs that were predictive of the occurrence of each type of consequence in logistics regressions, where we again entered the years of survey as a set of categorical independent variables, along with the demographic control variables. Table 4 presents the ORs, revealing yearly differences compared with the baseline year for each dependent variable (negative consequence item). The general decline in negative consequences over time is apparent in these data. In 2002, individual types of negative consequences were cut only slightly in some items (4 declined less than 10%; ORs

TABLE 4. Odds Ratios for Specific Negative Consequences of Student Drinking in the Past 12 Months, Comparing Each Survey Year to 2001 Baseline (Logistic Regressions Controlling for Sex, Race, US/International Status, and Class Year)

Dependent variable: negative consequence as a result of drinking in past 12 months	2002	2003	2004	2005	2006
Missed class	.77***	.66***	.60***	.56***	.47***
Performed poorly on test or project	.97	.86	.71***	.61***	.45***
Had unprotected sex	.84	.75**	.84	.71**	.63***
Had been taken advantage of sexually	.93	.80	.66***	.68**	.65***
Took advantage of someone sexually	.98	.61*	.82	.54**	.36***
Had been injured or hurt	.95	.81*	.33***	.38***	.34***
Damaged property	.82*	.69***	.97	.87	.58***
Got into a fight	.82	.82	.76*	.68**	.52***
Drove under the influence	.87	.62***	.55***	.52***	.48***
Got in trouble with police	.76*	.58***	.69**	.65**	.74*

* $p < .05$. ** $p < .01$. *** $p < .001$.

higher than 0.90), and the largest cut was by about one-quarter. By 2006, 5 of the 10 consequences were reduced by more than half, with the smallest reduction being more than one-quarter. Although the odds of experiencing a particular consequence did not decline in every year of the survey, the odds are lowest in the final year for 8 of the 10 items. In 2002, there were 3 statistically significant reductions in the odds compared with the baseline year 2001; 7 were significant in 2003 and 2004, 9 in 2005, and all 10 by 2006.

Last, to determine whether the observed reductions in negative consequences were correlated with exposure to alcohol education interventions, we explored associations between self-reported consequences and peak eBAC from usual drinking with respondent recall of intervention exposure. We could not test recall of messages directed at first-year students because exposure was almost universal each year (see Table 1) and yielded no unexposed comparison group. We could, nevertheless, test the association between students' recall of the campuswide or general social norms intervention because larger proportions of students (see Table 1) did not recall seeing the campaign, thus providing a substantial group for comparison. For example, from 2003 through 2006, about one-quarter of respondents (27%) did not recall seeing any of the general campuswide campaign messages, 15% recalled 1 message, and more than half (58%) recalled multiple messages.

We restricted our assessment of the association between exposure to the campuswide messages and negative consequences to first-year students living on campus (almost all first-year students) in these surveys. We did so to best reduce confounding effects of more diverse living environments and social activities typically found among upper-class students residing in either off-campus apartments or Greek housing. These varying housing and social activities likely affect students' degree of exposure to messages, and these varying housing environments and social activities may also correlate with differing risks of alcohol misuse. Thus, by examining first-year students who reside in campus residence halls and whose social lives take place mostly in campus-related activities where they would see the messages, we might have achieved a better test of the direct association between message exposure and drinking consequences.

We used logistic regression, allowing recall of 1 or more campuswide campaign messages to predict having experienced 2 or more negative consequences. We entered sex, race, citizenship status (international/US), specific residence hall, and year of survey as control variables to remove any spurious effects of these factors. The resulting OR for exposure predicted a 22% reduction (OR = 0.78, 95% confidence interval [CI] = 0.64–0.95, $p < .05$), with recall of 1 or more messages compared with no recall of a message. Thus, exposure to the social norms intervention that was part of the campuswide campaign was statistically associated with reduction in drinking consequences among the first-year students.

Beginning in 2003, we collected survey measures permitting calculation of peak eBAC for usual drinking amount (see

Table 5). Students exposed to the campaign tended to have lower mean eBACs than did students with no recall of exposure. We used logistic regression to test the statistical significance of this difference in eBAC by exposure and to test how robust it is when controlling for sex, race, citizenship status, specific residence hall, and year of survey effects.

In this logistic regression, we entered recall of 1 or more campuswide campaign messages as an independent variable to predict having a peak eBAC higher than .08. From 2003 to 2006, first-year students with recall of any exposure to the campuswide campaign demonstrated a 24% reduction in the likelihood of having an eBAC greater than .08 compared with students with no recall of a campaign message (OR = 0.76, 95% CI = 0.62–0.92, $p < .01$). Thus, among these first-year students, exposure to the campuswide social norms intervention was statistically associated with lower eBACs.

COMMENT

In this study, we report significant decreases in the odds of students suffering several serious consequences associated with alcohol use over a 6-year period. For all undergraduates, the likelihood of experiencing none of the 10 alcohol-related consequences increased by 113%, and the chances of experiencing multiple consequences decreased by 57%. First-year students exposed to the campuswide social norms campaign reported a 22% reduction in the odds of experiencing multiple negative consequences and a 24% reduction in the odds of having an eBAC greater than .08 the last time they partied.

The observed findings have profound implications for the overall improvement of health status in this student population. For example, considering an undergraduate population of 12,500 and the decreasing probability of negative consequences occurring among students who drink, we estimate that in 2006 (compared with 2001), 1,972 fewer students were injured by alcohol-related events, 1,511 fewer drove under the influence of alcohol, and 553 fewer engaged in unprotected sex as a result of alcohol. Even more dramatic is that nearly 2,480 more students reported 0 of 10 serious alcohol-related consequences in 2006 versus 2001; summing absolute increases for all years yields 9,108 more students experiencing none of these alcohol-related consequences over 6 years.

Our observations are in striking contrast to national data about college student alcohol-related consequences during a similar time period. National surveys of college students report either no decrease or even slight increases in 7 negative consequences between 2001 and 2005.^{14–18} In a study that immediately preceded our study period (1997–2001), Weitzman et al¹⁹ reported no change in self-reported negative consequences among 32 control institutions and minimal but statistically significant declines in 6 of 14 negative consequences among only 5 of 10 schools, using other types of environmental interventions.

In the current study, exposure to the campaign was associated with a lower eBAC and fewer negative consequences

TABLE 5. First-Year Student Drinkers' Exposure to Campuswide Campaign and Estimated BAC (eBAC), by Exposure

Exposure	2003			2004			2005			2006		
	%	M	SD	%	M	SD	%	M	SD	%	M	SD
First-year student drinkers who saw campuswide norms message at least once ^a	88	.0889	.0719	73	.0949	.0774	86	.0940	.0708	85	.0721	.0616
eBAC of students exposed at least once	NA ^b	NA ^b	NA ^b									
eBAC of students with no recall of exposure	NA ^b	.0923	.0823		.0963	.0742		.1030	.0766		.0942	.0742

^aExcludes students aged 26 years and older and students living off campus.
^bCampuswide campaign did not commence until the 2002–2003 academic year.

among first-year students. Attributing our observations completely to the social norms intervention or a set of other interventions is challenging; however, other researchers^{7,20–22} have observed a link between social norms campaigns on college campuses and declines in a range of alcohol-related negative consequences.

Moreover, in our university environment there were no new institutional or community wide alcohol policies or laws implemented during the intervention time period. Fraternity rush had been moved to the spring semester several years earlier, and enhanced enforcement of possession laws and policies began in the mid '90s. As a result of the September 11 attacks, the university implemented a number of enhanced on-campus security measures, including (1) banning fans from leaving football games during halftime for tailgate parties and (2) sending additional uniformed police officers to residence hall areas on weekends. City and university police increased the number of foot patrols in the campus bar areas in the fall of 2005, perhaps leading to more alcohol-related arrests and accounting for an increase in students reporting trouble with police in the last year of the study. The surrounding community had not changed any liquor laws or imposed keg registration or limits on purchases. The number of nearby bars or retail outlets selling alcohol had not changed. The state of Virginia passed no new state legislation or taxes that would have affected student access or use of alcohol between 2001 and 2006. We are unaware of any significant retail price changes that occurred during this timeframe.

This report must be considered in view of certain limitations. Because we based our results on self-reported data, they are subject to several sources of error. Participants who intentionally or unintentionally distort responses may cause reporting bias. Pressure to give socially desirable responses or recall bias may be additional sources of error. However, current literature reveals that self-report data are generally reliable and valid.^{23–27} With the exception of our first year, each year yielded response rates of about 50%, and respondent characteristics reasonably represented a cross-section of the student body. Moreover, we used multivariate procedures to control for yearly variances in respondent demographics.

Despite these limitations, we believe the evidence strongly suggests that the social norms educational intervention succeeded in a high degree of audience penetration, initially among first-year students and later among the entire undergraduate population and high-risk target groups. Surveying students about their attitudes and behaviors as well as their recall of normative messages is important because it enhances awareness and facilitates the dissemination of relevant campus-specific information about social norms.²⁸

Students who were reached by these messages reported lower eBACs and a significantly lower probability of experiencing alcohol-related consequences than did students who had no recall of the campuswide campaign. Our study provides cautious optimism and encouragement for those engaged in campus alcohol and drug prevention nationally.

In contrast with the national experience, the tide has turned on drinking-related consequences in this university setting. Other institutions should be aware of these findings. Further research on our programmatic approach should include the study of variation in audience penetration and replication of this strategy on other campuses.

NOTE

For comments and further information, address correspondence to Dr James Turner, PO Box 800760, 400 Brandon Ave., Charlottesville, VA 22908-0760, USA (e-mail: jct4w@virginia.edu).

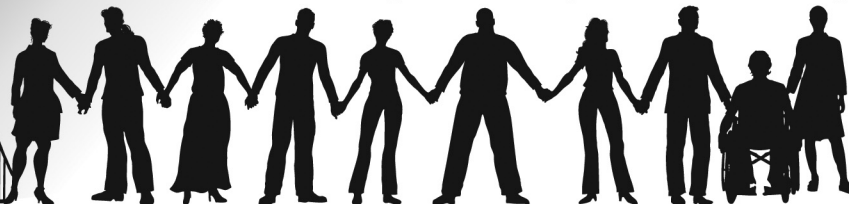
REFERENCES

- Wechsler H, Lee JE, Kuo M, et al. Trends in college binge drinking during a period of increased prevention efforts. Findings from 4 Harvard School of Public Health College Alcohol Study surveys: 1993–2001. *J Am Coll Health*. 2002;50:203–217.
- Johnson L, O'Malley P, Bachman J, Schulenberg J. *Monitoring The Future National Survey Results on Drug Use, 1975–2004. Vol II. College Students and Adults Ages 19–45*. Washington, DC: US Dept of Health and Human Services; 2005.
- Perkins HW, Meilman PW, Leichliter JS, Cashin JR, Presley CA. Misperceptions of the norms for the frequency of alcohol and other drug use on college campuses. *J Am Coll Health*. 1999;47:253–258.
- Perkins HW, Haines MP, Rice R. Misperceiving the college drinking norm and related problems: a nationwide study of exposure to prevention information, perceived norms and student alcohol misuse. *J Stud Alcohol*. 2005;66:470–478.
- Mattern J, Neighbors C. Social norms campaigns: examining changes in perceived norms and changes in drinking levels. *J Stud Alcohol*. 2004;65:489–463.
- Haines M, Spear S. Changing the perception of the norm: a strategy to decrease binge drinking among college students. *J Am Coll Health*. 1996;45:134–140.
- Perkins HW, Craig DW. A successful social norms campaign to reduce alcohol misuse among college student–athletes. *J Stud Alcohol*. 2006;67:880–888.
- Borsari B, Carey KB. Descriptive and injunctive norms in college drinking: a meta-analytic integration. *J Stud Alcohol*. 2003;64:331–341.
- University of Virginia. Office of Orientation FAQ Web site. <http://www.virginia.edu/orientation/faqs.html>. Accessed September 4, 2006.
- Perkins HW. The promise and challenge of future work using the social norms model. In: Perkins HW, ed. *The Social Norms Approach to Preventing School and College Age Substance Abuse: A Handbook For Educators, Counselors, and Clinicians*. San Francisco, CA: Jossey-Bass; 2003:280–296.
- Turner J, Bauerle J, Shu J. Estimated blood alcohol concentration correlation with self-reported negative consequences among college students using alcohol. *J Stud Alcohol*. 2004;65:741–749.
- Dillman DA. *Mail and Internet Surveys: The Tailored Design Method*. 2nd ed. New York: John Wiley & Sons; 2000.
- Bosari B, Neal DJ, Collins SE, Carey KB. Differential utility of 3 indexes of risky drinking for predicting alcohol problems in college students. *Psychol Addict Behav*. 2001;15:321–324.
- American College Health Association. *National College Health Assessment. Reference Group Report Spring 2001*. Baltimore, MD: ACHA; 2002.
- American College Health Association. *National College Health Assessment. Reference Group Report Spring 2002*. Baltimore, MD: ACHA; 2002.
- American College Health Association. National College Health Assessment (ACHA–NCHA), spring 2003 reference group report (abridged). *J Am Coll Health*. 2005;53:199–210.
- American College Health Association. National College Health Assessment (ACHA–NCHA), spring 2004 reference group report (abridged). *J Am Coll Health*. 2006;54:201–211.
- American College Health Association. National College Health Assessment (ACHA–NCHA), spring 2005 reference group report (abridged). *J Am Coll Health*. 2006;55:5–16.
- Weitzman E, Nelson T, Lee H, Wechsler H. Reducing drinking and related harms in college: evaluation of the “A Matter of Degree” program. *Am J Prev Med*. 2004;27:187–196.
- Foss RD, Marchetti LJ, Holladay KA. *Development and Evaluation of a Comprehensive Program to Reduce Drinking and Impaired Driving Among College Students*. Washington, DC: Dept of Transportation; 2001. Report No. DOT HS 809 396.
- Perkins HW, Craig DW. *Multifaceted Social Norms Approach to Reduce High-Risk Drinking: Lessons from Hobart and William Smith Colleges*. Newton, MA: Higher Education Center for Alcohol and Other Drug Prevention; 2002.
- Johannessen K, Glider P. The University of Arizona's campus health social norms media campaign. In: Perkins HW, ed. *The Social Norms Approach to Preventing School and College Age Substance Abuse: A Handbook For Educators, Counselors, and Clinicians*. San Francisco, CA: Jossey-Bass; 2003:65–82.
- Babor TF, Steinberg K, Anton R, Del Boca F. Talk is cheap: measuring drinking outcomes in clinical trials. *J Stud Alcohol*. 2000;61:55–63.
- Cooper AM, Sobell MB, Sobell LC, Maisto SA. Validity of alcoholics' self-reports: duration of data. *Int J Addict*. 1981;16:401–406.
- Midanik LT. Validity of self-reported alcohol use: a literature review and assessment. *Br J Addict*. 1988;83:1019–1029.
- Gruenewald PJ, Johnson FW. The stability and reliability of self-reported drinking measures. *J Stud Alcohol*. 2006;67:738–745.
- Miller E, Neal D, Roberts, L, et al. Test–retest reliability of alcohol measures: is there a difference between Internet-based assessment and traditional methods? *Psychol Addict Behav*. 2002;16:56–63.
- Perkins HW, Berkowitz AD. Using student alcohol surveys: notes on clinical and educational program applications. *J Alcohol Drug Educ*. 1986;31:44–51.

CALL FOR PROGRAMS



Building Bridges by the Bay



ACHA 2009 ANNUAL MEETING SAN FRANCISCO, CA • MAY 26-30

Join us for the ACHA 2009 Annual Meeting in elegant, diverse San Francisco. San Francisco, a city famous for its multicultural heritage, is the perfect place for us to “build bridges by the bay!”

We invite you to join us for this much-anticipated event by being a presenter. The deadline for submitting your program proposals for the 2009 Annual Meeting is **September 13, 2008**. The Call for Programs process is being conducted online at www.acha.org/AnnualMeeting09.

In keeping with the theme of building bridges, the 2009 Annual Meeting will include a special focus area on cultural competency in college health. ACHA believes that healthy communities must be guided by the values of inclusion, respect, and equality. Intolerance and subtler forms of insensitivity or exclusion have no place at an institution of higher education, and many of us have a role to play in addressing these issues.

Each section program planner (Administration, Advanced Practice Clinicians, Clinical Medicine, Health Promotion, Mental Health, Nurse-Directed Health Services, Nursing, Pharmacy, Students/Consumers) is encouraged to select for presentation a program that best addresses cultural competency from that discipline’s viewpoint.

Visit our website for your submission forms and instructions. For more information, contact Cynthia Perez, program coordinator, at cperez@acha.org, or call (410) 859-1500.

www.acha.org/AnnualMeeting09



American College Health Association