

Perception and Reality: A National Evaluation of Social Norms Marketing Interventions to Reduce College Students' Heavy Alcohol Use*

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ABSTRACT. *Objective:* To evaluate a widely used intervention to reduce college student alcohol use, we studied student drinking patterns at colleges that employed social norms marketing programs and those that did not. *Method:* We examined responses of students in the Harvard School of Public Health College Alcohol Study (CAS) 1997, 1999 and 2001 data sets at 37 colleges that employed social norms marketing programs and at 61 that did not. Information about the students' drinking behavior and their familiarity with social norms marketing messages at their schools was analyzed, as were college administrators' reports about the implementation of social norms marketing campaigns. Schools were grouped on the basis of student reports of exposure to programmatic materials. Trend analyses were conducted on seven standard measures of alcohol consumption, including annual and 30-day use, frequency,

usual quantity and volume consumed, heavy episodic use, and drunkenness. *Results:* Almost half of the CAS colleges sampled adopted social norms programs. Those that did were more likely to have large enrollments, not to be religiously affiliated and to have high rates of alcohol use. No decreases were noted in any of the seven measures of alcohol use at schools with social norms programs, even when student exposure and length of program existence were considered. Increases in measures of monthly alcohol use and total volume consumed, however, were observed at schools employing social norms programs. *Conclusions:* This study does not provide evidence to support the effectiveness of social norms marketing programs, as currently utilized, in reducing alcohol use among college students. (*J. Stud. Alcohol* **64**: 484-494, 2003)

FOUR IN FIVE college students drink alcohol, and two in five engage in heavy episodic drinking (O'Malley and Johnston, 2002; Wechsler et al., 2002b), which is defined as the consumption of five or more drinks in a row at least once in the past 2 weeks for men and four or more drinks in a row for women (Wechsler et al., 1995a; Wechsler and Nelson, 2001). This form of drinking is prevalent in the general population. A study by the Centers for Disease Control and Prevention found that over 60% of adult male drinkers 18 to 25 years old in the United States engaged in heavy episodic drinking in the past month (Naimi et al., 2003). College students, however, engage in heavy episodic drinking at higher rates than their same-age peers who do not attend college (Bachman et al., 1984; O'Malley and Johnston, 2002). Heavy episodic drinking is associated with a number of adverse health, educational and social consequences—including physical injury, high-risk sexual behavior, alcohol overdose, alcohol-impaired driving, psychosocial

problems, anti-social behavior and academic difficulties (Perkins, 2002; Wechsler et al., 1994, 1998, 2000c, 2002b). An estimated 500,000 college students aged 18-24 suffer unintentional injuries while under the influence of alcohol, and 1,400 die each year from alcohol-related unintentional injuries (Hingson et al., 2002). Colleges with high rates of heavy episodic drinking also have high rates of sleep and study disruption; vandalism; and verbal, physical and sexual violence (Wechsler et al., 1995b). Approximately 600,000 college students are assaulted each year by students who have been drinking (Hingson et al., 2002). Community residents living near heavy drinking schools experience higher rates of noise disruptions, public drunkenness, crime, property damage and police visits than those who live in neighborhoods near schools with lower rates of heavy drinking and those who do not live near a college (Wechsler et al., 2002a). These problems with alcohol have led the U.S. Surgeon General to establish a 50% reduction in heavy episodic drinking among college students by the year 2010 as one of the nation's health goals (Department of Health and Human Services, 2000). These alcohol-related problems have also prompted the National Institute on Alcohol Abuse and Alcoholism (NIAAA) to form an advisory council to review the state of the science and make recommendations to the field (Boyd and Faden, 2002; Goldman, 2002; Task Force of the National Advisory Council [Task Force], 2002).

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College administrators recognize the negative influence of student heavy alcohol use on college life. More than half consider alcohol a problem on their campuses (Wechsler et al., 2000a), but despite attempts to curb problem drinking, little change has been seen in national college drinking levels in the past decade (O'Malley and Johnston, 2002; Wechsler et al., 2002b).

In recent years, social norms marketing has become a popular method to combat student alcohol abuse. Because it attempts to highlight latent healthy norms about drinking, this strategy offers a positive approach that seems appealing. A typical social norm message would be: "Most students have five or fewer drinks when they party," and these messages are conveyed through a variety of mass media promotions such as posters, flyers and other unique announcements (Haines, 1996). The nonconfrontational tone of social norms marketing messages reassures both students and administrators and engenders less resistance than do policies and actions designed to control behavior or limit access to alcohol. Since social norms marketing campaigns downplay the level of drinking on campus and do not emphasize the negative consequences of heavy alcohol consumption or suggest that drinkers could harm themselves or others, the alcohol industry has also found them attractive.

Social norms marketing programs have been widely adopted by colleges and universities (Keeling, 2000). A 2002 Harvard School of Public Health (HSPH) survey of 746 U.S. college presidents found that nearly half (48%) of all 4-year residential colleges and universities have conducted, or are currently conducting, social norms marketing campaigns (HSPH, unpublished data, 2002). Since 1990, millions of privately and publicly funded dollars have been spent on designing and implementing social norms marketing campaigns (Haines, 2002). The Department of Education (DOE) has supported social norms marketing programs, awarding grants totaling \$2 million (76% of the entire grant competition monies) in 2000 and an additional \$1.5 million in 2001 (Department of Education, 2001). Since 1997, NIAAA has sponsored five grants directed at adolescents and college students that emphasize correcting social norms. The Higher Education Center for Alcohol and Other Drug Prevention (2002), funded as a national resource center on college alcohol and other drug use by the DOE, assists colleges in developing these programs and promotes their use. Anheuser-Busch, the producer of the largest selling brand of beer in the U.S., has pledged \$5 million to support a Social Norms Resource Center at Northern Illinois University and also funds individual college campaigns (American Medical Association, 2001).

Social norms marketing programs have the appearance of being a successful strategy to reduce alcohol use among college students. A proliferating number of conferences have addressed the topic (Haines, 2002), and social norms mar-

keting programs have also been covered extensively in the national media (Frauenfelder, 2001). Our own LexisNexis search of articles and electronic media reports about social norms marketing programs from 1996 to 2002 located 226 citations, including 61 major newspaper articles, many of which tout the success of the program. The NIAAA task force panel on college drinking describes the social norms marketing approach as having evidence of logical and theoretical promise while recommending further evaluation of its effectiveness (Task Force, 2002).

At the same time, there has been very limited empirical support for these programs. We reviewed the scientific literature that pertains to the social norms marketing approach, including a review published on the internet by one of the originators of the method (Berkowitz, 2003). A large number of the articles cited in support of social norms marketing are unpublished presentations, working papers, newsletters or dissertations. Of those that were published in peer-reviewed journals, most studies measured levels of student misperceptions of drinking on campus and their correlates (Berkowitz, 2003; Perkins, 2003), but did not examine specific intervention strategies.

We were able to locate only four studies published in the peer-reviewed literature that evaluated drinking behaviors as outcomes in response to social norms marketing programs. The most widely cited study (Haines and Spear, 1996) reported a drop in drinking rates at one university following implementation of a social norms marketing campaign. The study was conducted on nonrandom samples of first- and second-year students. The study did not control for demographic differences between the student samples who provided responses before and after the campaign. In fact, a higher percentage of women and younger students participated at the end of the campaign than during the baseline measurement. These two groups have been found to drink less (Wechsler et al., 2000b, 2002b,c), and their increasing presence in the study sample may have contributed to the drop in drinking rates measured. Without control for sample demographics, it is difficult to interpret the findings. The study also lacked an appropriate comparison group to control for secular changes. The method employed in this study is susceptible to the Rosenthal effect, whereby study participants can score higher or lower on a study outcome as a result of expectancies communicated to them by the investigator (Rosenthal, 1966), and to demand characteristics, whereby the study participants respond according to their perceived hypothesis of the investigation (Orne, 1962). These experimenter expectancy effects may have biased the findings of the study in favor of a spurious result.

Two other studies evaluated social norms marketing campaigns implemented on single campuses (Glider et al., 2001; Gomberg et al., 2001) and contain similar methodological concerns. Gomberg and colleagues found an overall decrease

in mean drinks per week and in percentage of "high-risk drinkers" following a social norms marketing campaign. This study used nonrandom samples of first-year English students, was subject to experimenter expectancy effects and failed to weight or control for the reported demographic changes in the samples. The analyses suggest that reported changes in behavior are unrelated to the campaign, as those students who recognized the campaign's logo (i.e., those who actually saw the social norms marketing materials) showed no significant decrease in the number of drinks per week or in high-risk drinking behavior (Gomberg et al., 2001).

The study by Glider and colleagues (Glider et al., 2001) reported changes in perceptions about alcohol use, alcohol use behavior and alcohol-related harms following the implementation of a social norms marketing program. However, the response rates to their survey were less than 30% for the random sample and less than 20% for the nonrandom "high-risk" sample. It is important to note that the school increased funding for nonalcohol social events on campus and tightened its alcohol use policies during the same time frame that the social norms campaign was conducted, making it difficult to determine whether the changes observed could be attributed to the social norms campaign or the other interventions.

A fourth study that used more appropriate randomization procedures and comparison groups found no statistically significant differences between the groups in alcohol consumption measures (Werch et al., 2000).

In addition to these four studies that examined social norms marketing approaches, researchers have studied other group educational approaches that provide students with information to correct normative misperceptions. These programs are consistent with a social norms marketing approach but feature group discussions, classroom-based interventions or individualized normative feedback rather than a broad-based media campaign (Barnett et al., 1996; Hansen and Graham, 1991; Peeler et al., 2000; Schroeder and Prentice, 1998; Steffian, 1999; Walters et al., 2000). Some have examined the role of social norms in changing student perceptions of drinking norms but have not documented changes in behavior (Peeler et al., 2000). These studies are subject to several methodological problems as well, the most salient being the use of nonrandom samples, failure to control for the confounding effect of demographic changes in the samples, short follow-up periods, small sample sizes and failure to take into account the effects of high attrition and/or low response rates.

To date, evaluations of social norms marketing campaigns have been conducted on single college campuses and have not employed comparison groups; study design issues that limit conclusions about the effectiveness of the programs. Given the resources currently invested in supporting social norms marketing and the limited empirical

base to date, these programs should be carefully evaluated to determine their effectiveness through scientific studies employing generally accepted research methods. One method for evaluating these types of programs is a national, multicollge study that uses behavioral outcome measures, documents exposure to programs, employs appropriate comparison groups and controls for demographic changes over time. The present study utilizes data from the HSPH College Alcohol Study (CAS) to determine whether schools that use social norms marketing campaigns experience reductions in students' heavy-drinking behaviors and to compare any observed changes with the experience of schools that do not use such programs.

Method

Data for the present analyses were drawn from the 1997, 1999, and 2001 CAS surveys of students at 120 accredited four-year colleges and universities in the United States. In each survey year the CAS conducted a mail survey of students whose names were generated at random by registrars at the participating schools. A cover letter sent to 215 students selected to participate at each college instructed them on their rights as human subjects. The survey responses were anonymous and confidential, and on this basis the study was given exempt status by the HSPH Human Subjects Committee. The mailings were timed to avoid spring break at each school in order to measure drinking behavior on campus rather than during vacation. Further details on the survey methodology and on the sample composition are described elsewhere (Wechsler et al., 1994, 1998, 2000c, 2002b).

Response rates differed for each of the survey years: 52% in 2001 (range 22%-86% for each college), 59% in 1999 (range 27%-83%), 59% in 1997 (range 29%-88%). Because there was a possibility of error due to nonresponse, we examined response rates at schools with and without social norms marketing programs and found that they did not differ (social norms schools: 1997-60.1%, 2001-52.6%; no program schools: 1997-57.6%, 2001-51.1%).

We also used information from a 2001 survey of administrators at the participating schools. The respondents were primarily deans of students but also included other administrators, such as senior student affairs officers, health center directors, counselors and residence hall directors. The survey contained questions concerning school policies on substance use and alcohol education.

Data from one school were excluded because its student response rate was substantially lower than that of the other schools. A second school closed following the 2001 school year, and administrators there could not be reached to complete the survey. The remaining sample of 118 colleges represents a national cross-section of students enrolled at 4-year colleges. Of the responders, 70% attended public

colleges and 30% attended private colleges, a distribution that approximates the U.S. national distribution of 68% and 32%, respectively, for full-time 4-year college students (National Center for Education Statistics [NCES], 1990). Of responders, 48% attended large (>10,000 students), 23% medium-sized (5,001-10,000 students), and 29% small (<5,001 students) colleges. The U.S. national distribution is 37%, 24% and 40%, respectively (NCES, 1999). Compared to 71% of students nationwide, 68% of responders attended schools in large or medium-sized cities, and 13% attended religiously-affiliated schools compared to 16% nationwide (NCES, 1999); 5% of students attended all-women colleges.

Outcome measures

Seven standard survey measures were used to examine different aspects of student drinking behavior. These included four that were based on all students: (1) any alcohol use in the past year; (2) any alcohol use in the past month; (3) heavy episodic drinking (or as we have called it in other published reports, “binge drinking”), defined as the consumption of five or more drinks in a row at least once in the past 2 weeks for men and four or more drinks in a row for women (Wechsler et al., 1995a; Wechsler and Nelson, 2001); and (4) number of drinks consumed in the past month (20 or more drinks vs fewer than 20). For students who had at least one drink in the past month we examined: (5) drinking on 10 or more occasions during the past month; (6) experiencing drunkenness three or more times in the past month; and (7) usual number of drinks consumed on a drinking occasion (five or more vs fewer than five).

Institutional participation in social norms marketing campaigns

To identify schools that employed social norms marketing programs, the administrator survey asked whether or not each school had “ever conducted a ‘social-norms’ campaign to decrease alcohol use and related problems on campus”; and, if it had, the time period during which the program was conducted.

To determine the type of schools adopting social norms marketing programs, we included all 118 colleges. To examine outcome measures, however, we looked at only those colleges that adopted the programs after our 1997 baseline measure was obtained and at least 1 year before our 2001 survey. This time requirement resulted in the elimination of 20 colleges from the social norms group: 14 that implemented programs before 1997 and 6 after 2000.

In addition to determining whether or not a social norms marketing campaign was conducted on each campus, we

assessed the degree to which students were exposed to elements of the program through several student questionnaire responses. We asked students whether their school provided them with information on student drinking rates on their campus as part of an educational campaign. We also asked students whether they had been exposed to alcohol education materials or programs by (1) receiving handouts or mailings, (2) seeing signs or posters, or (3) reading announcements or articles in their school newspaper. Each of these measures was aggregated at the school level. Using these three variables of exposure, we created an index to measure the intensity of exposure to a social norms marketing campaign at each of the campuses. The schools conducting a social norms marketing program during the study period were rank-ordered by the level of each variable. We put the highest weight (3) to being provided with student drinking rate and a lower weight (1) to the other three variables. The greater weight placed on the students being provided with drinking rates reflects the emphasis of social norms marketing programs to highlight actual alcohol use among students at that school and promote low levels of drinking as the campus norm. Weighted school ranks of each variable were summed, and these summed ranks were rank-ordered again. We classified the top 20 schools as having high levels of program exposure and 17 schools as having lower levels of exposure. The same procedure was followed for the 61 schools at which no social norms marketing program was operating. At 13 of these colleges we noticed some student exposure to components of social norms marketing programming. The remaining 48 non-social norms schools with minimal levels of exposure to social norms marketing program components composed the most appropriate comparison group to the high-exposure social norms marketing program group.

Data analysis

The initial analyses examined the characteristics of schools conducting social norms marketing campaigns and included all 118 schools in the sample. The analyses of primary interest examined the efficacy of social norms marketing programs. We looked at time trends in alcohol measures at the 37 schools that adopted these programs between 1997 and 2000 and compared them to 61 that did not. We also looked at subgroups of colleges. The most salient comparison was between the 20 high-exposure social norms marketing schools and the 48 minimal-exposure non social norms colleges. We also examined schools by duration of social norms marketing programs, (≥ 2 years and < 2 years). Finally, each school was examined individually for change over time.

Weighted percentages and directly standardized rates of alcohol use according to the age, gender and racial/ethnic

TABLE 1. Characteristics of colleges implementing social norms programs

Characteristic (N)	% Conducting social norms campaign	Chi-square p value
All (118)	48.3	
Enrollment ≤5,000 (37)	29.7	0.0064
Enrollment 5,001-10,000 (28)	35.7	0.1269
Enrollment ≥10,001 (53)	67.9	0.0001
Public (81)	54.3	
Private (37)	35.1	0.0530
Suburban/urban (86)	47.7	
Rural/small town (32)	50.0	0.8222
Highly competitive (52)	55.8	
Less competitive (66)	42.4	0.1498
Commuter school (15)	26.7	
Not commuter school (103)	51.5	0.0726
Northeastern region (29)	41.4	0.3901
Southern region (37)	43.2	0.4571
North central region (32)	50.0	0.8222
Western region (20)	65.0	0.1011
Religious affiliation (16)	25.0	
Not affiliated (102)	52.0	0.0448

distributions of each school are reported for all analyses using student-level data to control for demographic representation of the survey sample. The details of the weighting and standardization procedure are described elsewhere (Wechsler et al., 2002b). Comparisons of school character-

istics and outcomes of interest were examined using chi-square tests and logistic regression. The multiple logistic regression technique was used to assess the relationship among the outcomes of interest adjusting for other covariates. Odds ratios (OR) and 95% confidence intervals (CI) are reported. Comparisons of prevalence rates and bivariate associations between categorical variables were performed using SAS (SAS Institute, 1994). SUDAAN Version 7.5 (Shah et al., 1997) was used for multiple logistic regression analyses to model the prevalence of the outcome variables over time. SUDAAN employs a Taylor series linearization to approximate correct standard errors for sample estimates, given the multistage sampling design of the survey and the effects of sample weighting. Analyses were adjusted for gender, age and race/ethnicity. They were also adjusted for college-level response rates to the survey to control for possible bias introduced by nonresponse. Changes among individual schools were examined using weighted data and chi-square tests.

Results

Among the 118 schools in the national CAS sample, 57 had and 61 had not implemented a social norms marketing campaign, prior to the 2001 CAS survey (Table 1). Schools with social norms marketing programs were more likely to have large enrollments and were less likely to be affiliated with religious organizations.

TABLE 2. Student exposure to components of social norms programs, in percents

Program (N)	Reporting school provided student drinking rate	Seeing posters or signs	Reading announcements or articles in student newspaper	Receiving mailing or handouts
Social norms schools (37)	50.6	74.6	65.4	37.2
High-exposure (20)	68.2	84.1	75.2	48.9
Lower-exposure (17)	27.7	62.3	52.8	28.5
≥2 years in duration (24)	55.5	77.7	69.3	39.4
<2 years in duration (13)	39.9	67.8	57.1	32.5
No program schools (61)	17.2	56.1	44.4	30.6
Some exposure (13)	26.9	76.5	66.8	45.6
Minimal-exposure (48)	14.2	49.8	37.5	26.0
OR (95% CI)				
No program vs social norms schools ^a	5.27 (3.63-7.66) [‡]	2.29 (1.64-3.19) [‡]	2.36 (1.74-3.20) [‡]	1.34 (1.05-1.73)*
Lower- vs high-exposure social norms schools ^b	2.18 (1.54-3.10) [‡]	3.72 (2.21-6.25) [‡]	2.50 (1.52-4.11) [‡]	6.28 (3.88-10.18) [‡]
<2 years vs ≥2 years duration ^c	1.34 (0.91-1.96)	1.56 (0.91-2.67)	1.55 (0.98-2.44)	1.66 (0.96-2.89)
Minimal- vs some-exposure no program schools ^d	2.76 (1.64-4.64) [‡]	1.92 (1.36-2.70) [‡]	2.17 (1.38-3.41) [‡]	1.46 (0.96-2.21)

Notes: All analyses controlled for age, gender, race and school response rate. ^aNo program schools were referent. ^bLower-exposure social norms schools were referent. ^c<2 years in duration schools were referent. ^dMinimal-exposure no program schools were referent.

* $p < .05$; [‡] $p < .001$.

TABLE 3. Trends in alcohol consumption by presence of social norms programs, in percent

Program (N)	Prevalence		OR (95% CI) change 1997 vs 2001
	1997	2001	
Drinking in the past year			
Social norms program (37)	83.3	84.1	1.11 (0.93-1.31)
High-exposure (20)	86.6	86.0	0.90 (0.69-1.18)
Lower-exposure (17)	79.3	82.0	1.29 (1.08-1.53) [†]
≥2 years duration (24)	84.9	85.5	1.09 (0.88-1.35)
<2 years duration (13)	81.5	81.4	1.04 (0.77-1.39)
No program (61)	77.2	77.1	0.87 (0.68-1.10)
Some-exposure (13)	87.3	87.2	0.86 (0.64-1.15)
Minimal-exposure (48)	74.3	74.1	0.80 (0.57-1.11)
OR (95% CI)			
No program vs social norms schools ^a	1.39 (0.97-2.00)	1.58 (1.08-2.32)*	
Minimal-exposure no program vs high-exposure social norms schools ^b	2.22 (1.26-3.90) [†]	2.85 (1.12-7.24)*	
Minimal-exposure no program vs ≥2 years duration social norms schools ^b	1.49 (1.02-2.17)*	1.77 (1.10-2.83)*	
Drinking in the past month			
Social norms program (37)	68.9	73.3	1.32 (1.18-1.48) [‡]
High-exposure (20)	73.9	77.2	1.19 (1.04-1.37)*
Lower-exposure (17)	62.8	68.4	1.43 (1.17-1.75) [‡]
≥2 years duration (24)	72.0	75.5	1.24 (1.11-1.39) [†]
<2 years duration (13)	64.4	69.7	1.42 (1.12-1.81) [‡]
No program (61)	63.3	63.8	0.96 (0.81-1.13)
Some-exposure (13)	78.3	76.5	0.86 (0.72-1.02)
Minimal-exposure (48)	59.0	59.9	0.92 (0.74-1.15)
OR (95% CI)			
No program vs social norms schools ^a	1.25 (0.94-1.66)	1.55 (1.18-2.05) [†]	
Minimal-exposure no program vs high-exposure social norms schools ^b	1.86 (1.26-2.73) [†]	2.51 (1.44-4.39) [†]	
Minimal-exposure no program vs ≥2 years duration social norms schools ^b	1.37 (1.03-1.83)*	1.45 (1.11-1.89) [†]	
Heavy episodic drinking			
Social norms program (37)	45.9	48.6	1.16 (1.04-1.26) [‡]
High-exposure (20)	50.1	53.6	1.16 (1.01-1.34)*
Lower-exposure (17)	40.9	42.1	1.11 (0.88-1.39)
≥2 years duration (24)	49.1	51.7	1.13 (0.99-1.29)
<2 years duration (13)	40.9	43.3	1.20 (0.98-1.47)
No program (61)	40.4	41.0	0.98 (0.87-1.11)
Some-exposure (13)	57.3	55.9	0.92 (0.77-1.09)
Minimal-exposure (48)	35.6	36.5	0.96 (0.82-1.12)
OR (95% CI)			
No program vs social norms schools ^a	1.23 (0.97-1.55)	1.34 (1.05-1.72)*	
Minimal-exposure no program vs high-exposure social norms schools ^b	1.69 (1.27-2.26) [‡]	1.92 (1.36-2.70) [‡]	
Minimal-exposure no program vs ≥2 years duration social norms schools ^b	1.33 (1.05-1.70)*	1.45 (1.11-1.89) [†]	
Drinking 20 or more drinks in past 30 days^c			
Social norms program (37)	30.7	35.3	1.31 (1.15-1.50) [‡]
High-exposure (20)	34.8	39.4	1.25 (1.07-1.45) [†]
Lower-exposure (17)	25.6	30.0	1.39 (1.01-1.96)*
≥2 years duration (24)	33.2	37.2	1.23 (1.06-1.43) [†]
<2 years duration (13)	25.7	31.1	1.54 (1.19-1.98) [‡]
No program (61)	25.9	28.2	1.10 (0.96-1.25)
Some-exposure (13)	40.8	41.9	1.00 (0.83-1.22)
Minimal-exposure (48)	21.6	24.0	1.08 (0.93-1.26)
OR (95% CI)			
No program vs social norms schools ^a	1.22 (0.95-1.55)	1.36 (1.06-1.74)*	

Continued

TABLE 3. *Continued*

Program (N)	Prevalence		OR (95% CI) change 1997 vs 2001
	1997	2001	
Minimal-exposure no program vs high-exposure social norms schools ^b	1.72 (1.31-2.17) [‡]	1.84 (1.31-2.59) [‡]	
Minimal-exposure no program vs ≥2 years duration social norms schools ^b	1.66 (1.26-2.19) [‡]	1.76 (1.30-2.36) [‡]	
Drinking on 10 or more occasions in the past 30 days ^c			
Social norms program (37)	23.7	24.5	1.15 (0.99-1.34)
High-exposure (20)	26.1	26.8	1.12 (0.93-1.35)
Lower-exposure (17)	20.3	21.2	1.14 (0.87-1.49)
≥2 years duration (24)	24.6	25.3	1.18 (0.98-1.42)
<2 years duration (13)	22.3	23.7	1.11 (0.86-1.43)
No program (61)	19.4	21.0	1.13 (0.99-1.30)
Some-exposure (13)	25.2	26.5	0.99 (0.78-1.25)
Minimal-exposure (48)	17.1	18.9	1.17 (0.99-1.39)
OR (95% CI)			
No program vs social norms schools ^a	1.21 (1.02-1.44)*	1.17 (0.96-1.43)	
Minimal-exposure no program vs high-exposure social norms schools ^b	1.52 (1.24-1.87) [‡]	1.34 (1.04-1.72)*	
Minimal-exposure no program vs ≥2 years duration social norms schools ^b	1.22 (1.02-1.46)*	1.19 (0.94-1.49)	
Drunk on three or more occasions in the past 30 days			
Social norms program (37)	31.8	31.2	1.04 (0.89-1.21)
High-exposure (20)	33.9	34.2	1.05 (0.87-1.26)
Lower-exposure (17)	28.7	26.7	1.01 (0.75-1.36)
≥2 years duration (24)	33.6	32.9	1.02 (0.84-1.23)
<2 years duration (13)	28.1	28.4	1.12 (0.89-1.42)
No program (61)	27.1	28.0	1.10 (0.97-1.24)
Some-exposure (13)	37.1	36.5	0.95 (0.76-1.18)
Minimal-exposure (48)	23.2	24.7	1.15 (1.00-1.32)*
OR (95% CI)			
No program vs social norms schools ^a	1.17 (0.97-1.40)	1.10 (0.92-1.32)	
Minimal-exposure no program vs high-exposure social norms schools ^b	1.50 (1.19-1.89) [‡]	1.33 (1.09-1.63) [‡]	
Minimal-exposure no program vs ≥2 years duration social norms schools ^b	1.23 (1.01-1.50)*	1.12 (0.92-1.37)	
Usually consuming five or more drinks per occasion in the past 30 days ^c			
Social norms program (37)	34.7	36.3	1.20 (1.02-1.42)*
High-exposure (20)	36.0	38.5	1.21 (0.99-1.47)
Lower-exposure (17)	32.8	33.0	1.26 (0.95-1.68)
≥2 years duration (24)	37.2	38.9	1.19 (0.98-1.45)
<2 years duration (13)	30.2	31.0	1.13 (0.78-1.62)
No program (61)	33.4	35.2	1.20 (1.05-1.36)*
Some-exposure (13)	42.1	42.9	1.05 (0.86-1.27)
Minimal-exposure (48)	30.0	32.2	1.24 (1.06-1.44) [†]
OR (95% CI)			
No program vs social norms schools ^a	1.00 (0.82-1.22)	0.96 (0.80-1.16)	
Minimal-exposure no program vs high-exposure social norms schools ^b	1.19 (0.92-1.55)	0.99 (0.80-1.23)	
Minimal-exposure no program vs ≥2 years duration social norms schools ^b	1.78 (0.86-1.36)	1.05 (0.87-1.26)	

Notes: All analyses controlled for age, gender, race and school response rate. ^aNo program schools were referent. ^bMinimal-exposure no program schools were referent. ^cAmong 30-day drinkers only.

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

Program exposure

Half (50.6%) of the students at the 37 schools with social norms marketing programs implemented after 1997 and before 2000 received information about student drinking norms on campus compared to only 17.2% of students at the 61 schools without these programs (Table 2). These differences were much greater when high-exposure social norms marketing schools were compared to nonprogram schools with minimal-exposure. For example, at high-exposure social norms marketing schools, two out of three (68.2%) students reported receiving information about drinking norms on campus, compared to only one in seven (14.2%) students at minimal-exposure non social norms program schools. At the high-exposure social norms marketing schools, more than four fifths (84.1%) of the respondents reported seeing posters or signs, and half (48.9%) reported receiving mailings and handouts.

Behavioral outcomes

Trend analyses at social norms marketing program schools revealed no significant decrease on any of the seven alcohol consumption measures (Table 3). This applied to all social norms marketing program colleges, those with high-exposure and those with program durations of 2 years or more.

On two of the outcome measures, we observed a pattern of significant increases in drinking at the social norms marketing program schools. The percentage of students who drank alcohol in the past month increased in the social norms marketing group and in the high and low exposure and the long and short duration subgroups. Moreover, the percentage of students consuming 20 or more drinks increased in all social norms marketing program schools, as well as in all subgroups of these colleges. On these two measures, all ten comparisons we conducted increased significantly. In all, of the 35 tests of significance on social norms marketing schools, there were 14 instances of increases in drinking rates and no instances of decreases.

There was no statistically significant pattern of increases or decreases at the schools that did not have social norms marketing programs. Significant increases were noted in 3 of the 21 tests of significance on the non social norms schools. There were no significant decreases.

When social norms marketing schools were compared to schools that did not have such programs, the social norms marketing colleges had alcohol consumption rates that were higher in 13 out of 21 tests of significance in 1997. These differences remained in 2001. In no case were schools adopting social norms marketing programs significantly lower in alcohol consumption.

As a final check, each individual school that reported implementing a social norms marketing program was ex-

amined individually over time. Although relatively small samples at individual schools posed a difficulty to obtaining statistically significant changes, we were interested in examining any pattern that might emerge. For drinking alcohol in the past year, one of 37 schools had a significant decline between 1997 and 2001, while three had a significant increase. Whereas no schools decreased significantly for drinking alcohol in the past month, three schools increased significantly. For heavy episodic drinking, no schools had a significant decrease while two schools increased significantly. There were significant increases at three schools on the 20 or more drinks per month measure, but no significant decreases were noted. Among drinkers, there were significant declines in drinking on 10 or more occasions in the past month at three schools and significant increases at two schools. Significant declines in reports of being drunk on three or more occasions occurred at four schools while no schools increased on this variable. For the variable of consuming five or more drinks on a usual drinking occasion, two schools had significant increases, and one school decreased significantly. When results were examined within schools, one school had a pattern of increased alcohol consumption on five of the seven alcohol consumption variables, and one school had decreases on three of the seven alcohol consumption variables. In total, 5.8% (15/259) of the possible variables showed significant increases in alcohol consumption, and 3.9% (10/259) decreased significantly.

Similar results were noted for minimal-exposure schools that did not implement social norms marketing programs. Two schools showed significant increases across multiple alcohol consumption variables, while no schools showed a pattern of significant decreases in alcohol consumption. In total, 4.8% (16/332) of the possible variables showed a significant increase while 2.4% (8/332) decreased significantly.

Discussion

This study is the first national evaluation of social norms marketing programs to reduce college student alcohol use. We did not detect a decrease in alcohol consumption at schools that implemented a social norms marketing program on measures of the quantity, frequency or volume of student alcohol use, or in measures of drunkenness and heavy episodic drinking. We used seven measures of consumption and separately examined schools at which social norms marketing programs were well established. In every respect, the findings were consistent: There was no drop in drinking behavior. On the other hand, we observed some significant increases on two of the five drinking measures: alcohol use in the past month and in drinking 20 or more drinks in the past month. At the same time, there was no similar sign of increase at schools that did not adopt social norms programs.

Schools with social norms marketing programs had higher rates of drinking at the baseline, which indicates that many schools that experience high rates of drinking and related harms are turning to social norms marketing to address their problems with alcohol. However, the drinking rates at these schools remained higher at the follow-up. This finding suggests that social norms marketing as practiced has thus far not been a solution to those problems.

The finding that schools implementing social norms marketing programs saw some increases in lower level drinking was predicted by the original theorists as a side effect of implementing a social norms marketing program (Perkins and Berkowitz, 1986). Other authors have cautioned against this as well (Barnett et al., 1996; Gomberg et al., 2001; Keeling, 2000; Peeler et al., 2000; Wechsler and Kuo, 2000). Further investigation is warranted to understand how a nondrinking student interprets social norms marketing messages.

The theory supporting a social norms marketing approach was developed at a relatively small private school with a homogeneous student population (Perkins and Berkowitz, 1986). It has been adopted primarily, however, by large public institutions with diverse student populations. In such settings, there may be no "typical student" or single common social norm. Our previous research has shown that one's estimate of drinking patterns on campus is governed by one's own drinking style (Wechsler and Kuo, 2000), and individual students' drinking behaviors align more closely to the drinking behaviors of their immediate social group rather than to the overall student population at a given school.

Several limitations of the present study should be considered. The study is based on self-reported behavior. Surveys of this type are subject to intentional and unintentional response bias, although surveys of alcohol use are generally considered to be valid (Cooper et al., 1981). The response rate may affect the results; however, the rates of alcohol use obtained through the CAS closely correspond to those in other major national surveys of college students (Centers for Disease Control and Prevention, 1997; Johnston et al., 2001; O'Malley and Johnston, 2002; Presley et al., 1999). The Monitoring the Future (MTF) study (Johnston et al., 2001) found that in 1997 alcohol use among college students in the past 30 days was 65.6%; the CAS found 66.0%. In 2001, MTF found use at 67.0%; CAS at 67.3%. For five or more drinks in a row in the past 2 weeks in 1997: MTF 40.7%, CAS 41.8%; in 2001: MTF 40.9%, CAS 41.8%. No differences in survey response rate existed between schools with social norms marketing programs and those that did not have similar programs. As a further precaution, we controlled for response rate in the trend analyses and employed a weighting procedure to correct for potential differences resulting from shifts in demographic subgroups of the sample. Another potential limitation is

that the social norms marketing campaigns we evaluated may not have met the standards of well-designed programs. Although we relied on administrator reports on the implementation of social norms marketing programs and obtained measures of student exposure to programmatic activities, we did not visit each campus to determine the content, scope and duration of their programs. Despite this limitation, these results do reflect the state of social norms marketing as currently practiced by colleges in a large national sample. We observed, moreover, no consistent patterns of change in drinking behavior at any single school implementing a social norms marketing program.

Social norms marketing programs may have been implemented because they provide a positive tone and a palatable "solution" to an otherwise frustrating and chronic problem. They may also be alternatives to (or distractions from) more difficult to implement but potentially more effective actions such as tougher penalties for alcohol-associated violations of standards of conduct, limiting students' access to alcohol, or controlling marketing practices of the alcohol industry. Such control measures have much greater empirical support (Holder et al., 2000; Shults et al., 2001; Substance Abuse and Mental Health Services Administration, 2001; Toomey and Wagenaar, 2002) and should be considered as part of comprehensive programs by colleges and communities.

We did not find evidence to support the effectiveness of social norms marketing approaches in reducing college student alcohol use. While this study does not provide a final conclusion about the effectiveness of social norms campaigns, we urge college administrators and health educators to base their prevention programs on scientific evidence instead of the perception of promise. Additional research should examine the theoretical basis and the implementation of these programs to see whether empirical support exists for this approach in combination with others.

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