

# Changes in Binge Drinking and Related Problems Among American College Students Between 1993 and 1997

## Results of the Harvard School of Public Health College Alcohol Study

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**Abstract.** In 1997, the Harvard School of Public Health College Alcohol Study resurveyed colleges that participated in a 1993 study. The findings revealed little change in binge drinking: a slight decrease in percentage of binge drinkers and slight increases in percentages of abstainers and frequent binge drinkers. Two of 5 students were binge drinkers (42.7%); 1 in 5 (19.0%) was an abstainer, and 1 in 5 was a frequent binge drinker (20.7%). As was true in 1993, 4 of 5 residents of fraternities or sororities were binge drinkers (81.1%). Asian students showed a greater increase and White students a greater decrease in binge drinking from 1993 to 1997, compared with all other students. Among students who drank alcohol, increases in frequency of drinking; drunkenness; drinking to get drunk; and alcohol-related problems, including drinking and driving, were reported. Binge drinkers in both 1993 and 1997 were at increased risk of alcohol-related problems, and nonbingers at colleges with high binge drinking rates had increased risks of encountering secondhand effects of binge drinking.

**Key Words:** alcohol and other substance use, bingeing, college students, correlates of use

**S**tudents' heavy episodic alcohol use, or binge drinking, is by far the single most serious public health problem confronting American colleges. In 1993, the Harvard School of Public Health College Alcohol Study (CAS) surveyed students at a nationally representative sample of colleges to explore the extent and consequences of

binge drinking and identify the types of students most involved in this behavior.

The 1993 findings showed that binge drinking was widespread among college students.<sup>1</sup> More than 2 of 5 students (44%) were classified as binge drinkers, the men reporting that they consumed five or more drinks in a row and the women four or more drinks in a row at least once in the 2 weeks before the survey. At one third of the colleges, more than half of the student body were binge drinkers.<sup>2</sup> Binge drinking was centered in fraternities and sororities.<sup>3</sup>

Binge drinkers produced problems for themselves and for others on campus. Binge drinking was associated with elevated risks for various alcohol-related educational, interpersonal, health, and safety problems for the individual drinker. Students who were not binge drinkers but lived on campuses with large numbers of binge drinkers were at heightened risks for experiencing secondhand effects, ranging in severity from common annoyances to vandalism and assaults.

Since the results of the CAS were published, several other national surveys of college populations have reported similar rates of binge drinking. Surveys conducted by the Monitoring the Future project,<sup>4</sup> the CORE institute,<sup>5</sup> and the Centers for Disease Control and Prevention<sup>6</sup> have all found that approximately 2 of 5 American college students can be termed binge drinkers.

Extensive media coverage following the release of the CAS findings in December 1993 has made the term *binge drinking* a routine part of news accounts of college incidents.<sup>7</sup> Such media coverage has been continuous, fueled anew with each report of an alcohol-related death from an overdose; an automobile collision; a fire, drowning, or other unintentional injury; or by disturbances on college campus-

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es related to heavy drinking occasions or attempts to restrict drinking.

We conducted a second survey of the CAS in 1997 to determine whether any change has yet occurred in rates of binge drinking and related problems. In this article, we report the results of the new survey and compare the prevalence and problems associated with binge drinking reported in 1993 with our 1997 findings.

## METHOD

### Sample of Colleges

In 1997, we resurveyed 130 (93%) of the original 140 colleges that participated in the 1993 CAS. The 1993 CAS surveyed a random sample of students in 140 4-year colleges in the United States. These colleges were selected from the American Council on Education's list of accredited universities, using probability sampling proportionate to the size of the institution. Details of the sample and research design of the 1993 survey have been published elsewhere.<sup>1,8</sup>

Ten of the 140 colleges that participated in 1993 did not participate in 1997. In both 1993 and 1997, the main reason for nonparticipation was college administrators' inability to provide a random sample of students and their addresses in the time allotted for the study. Response rates of 14 of the 130 schools that participated in 1993 and 1997 were low (fewer than 45% of eligible students responded) in either year, and we did not include them in the final analysis. Twelve schools had low response rates in the 1997 survey only, 1 was low in 1993 only, and 1 was low both years.

When we compared binge drinking rates of the 116 schools with the corresponding rates of the 130 schools in 1997 and the 140 schools in 1993, we found they were virtually identical. Dropping the 14 low-response schools did not change overall binge drinking rates.

The 116 schools surveyed are located in 39 states. They represented a cross-section of US higher education. More than two thirds of the colleges we sampled are public institutions, and less than one third are private. In terms of student enrollment, half of the schools (47%) are larger (more than 10,000 students), one fifth (21%) are medium size (5,001 to 10,000 students), and one third (32%) are smaller (fewer than 5,000 students). About two thirds are in an urban or suburban area, and one third are in small town or rural settings. Sixteen percent are religiously affiliated; 5% are for women only.

### Questionnaire

The self-administered instrument we used in 1997 repeated the same questions about alcohol and tobacco and other drug use; student lifestyle; and demographic and background characteristics that were used in 1993. Whenever possible, these questions were based on those used previously in national or other large-scale studies.<sup>4,8,9</sup> In the 1997 survey instrument, we included a few questions regarding tobacco and lifestyle that had not been used in 1993.

The questionnaire instructed participants to define a

"drink" in equivalent amounts of alcohol: a 12-oz (360 mL) bottle or can of beer; a 4-oz (120 mL) glass of wine; a 12-oz (360 mL) bottle or can of wine cooler; or a shot (1.25 oz or 37 mL) of liquor, either straight or in a mixed drink.

### The Measure of Binge Drinking

We defined *heavy episodic* or *binge drinking* as the consumption of at least five drinks in a row for men or four drinks in a row for women during the 2 weeks before the students completed the questionnaire. In the past decade, large-scale epidemiologic studies of youth alcohol use have employed five drinks in a row as a measure of binge drinking, and this has become a standard measure for both secondary school populations (the University of Michigan's National Institute on Drug Abuse [NIDA]-sponsored Monitoring the Future study) and college populations (Core Institute Survey). In an analysis of the 1993 CAS data, Wechsler and colleagues<sup>10</sup> found that using a gender-specific definition of binge drinking made the risk of alcohol-related problems equivalent for college men and women.

The CAS gender-specific measure of binge drinking was constructed from responses to four questions: (a) gender; (b) recency of last drink; (c) frequency of drinking five or more drinks during the past 2 weeks; and (d) frequency of drinking four or more drinks during the past 2 weeks. If a student's response to any of the questions was missing, we excluded that student's data from our analyses. In 1993, we excluded 2.6% of the replies, whereas we excluded 1.4% of the 1997 responses.

We classified students who had binged three or more times in the past 2 weeks as frequent binge drinkers, and those who had binged one or two times in the same period occasional binge drinkers. Nonbinge drinkers were those who had consumed alcohol in the past year but had not binged in the previous 2 weeks, and abstainers were those students who had not consumed any alcohol in the past year.

Students who had consumed alcohol in the past 30 days were asked to indicate how often they had a drink of alcohol in the past month. The response categories were 1 to 2 occasions, 3 to 5 occasions, 6 to 9 occasions, 10 to 19 occasions, 20 to 39 occasions, and 40 or more occasions. The drinking style of students who responded that getting drunk was *very important*, *important*, or *somewhat important* to them (as opposed to *not important*) was labeled "drinking to get drunk."

We asked several sets of questions about alcohol-related problems, including 12 health and behavioral consequences of one's own drinking and 8 consequences of other students' drinking. In each area, students were asked if they had encountered these problems since the beginning of the school year. We defined high school binge drinking for women as usually drinking four or more drinks of alcohol when they drank during their last year in high school; for men, the level was five or more drinks.

We examined secondary binge effects among students who were not current binge drinkers themselves but lived in college dormitories or in fraternity or sorority housing. We

divided colleges into three groups of nearly equal size according to the level of on-campus binge drinking: high (more than 50% of students bingeing), middle-level (36% to 50% of the students bingeing), and low-binge (35% or fewer binge drinkers). Alcohol-related sexual assault and unwanted sexual advances occurred almost exclusively to women; we present data for women only.

### Mailing and Response Rate

In both survey years, questionnaires were initially mailed to students at the end of February. Three separate mailings were sent within at least a 3-week period: first, a questionnaire; then a reminder postcard; finally, a second, follow-up questionnaire. We planned the timing of mailings to avoid the period immediately preceding and following spring break so that students would be responding to behavior during a time when they were on campus.

The study was rated exempt by Institutional Review Committees because it was anonymous and participation was voluntary. We achieved anonymity by instructing students not to include their names with returned questionnaires but to return separately an enclosed postcard indicating they had responded.

We offered cash awards to encourage students to respond—one \$1,000 award to a student whose name was drawn from among students responding within 1 week, one \$500 award, and 10 \$100 awards to students selected from all those who responded. Eighty-four percent of the final group of questionnaires were returned by the end of April 1997, 15% more arrived in May, and the remaining 1%

arrived in June and July. The 1993 survey described above was conducted in a very similar manner.<sup>1,8</sup>

In both years, we asked administrators at each college to provide a random sample of undergraduates drawn from the total enrollment of full-time students. In 1997, each of the 130 participating colleges provided a sample of 230 students. The 1993 sample consisted of 215 students from each of the participating colleges, except that the sample from 13 of the smallest schools consisted of only 108 names.

The 1997 questionnaires were mailed to 26,508 students at the 116 schools. Of these, 2,368 were eliminated because of incorrect addresses, withdrawal from school, or leaves of absence, reducing the sample size to 24,140. Sixty percent of the students who were reached responded, for a total of 14,521 returned questionnaires. In 1993, questionnaires were mailed to 23,977 students at the 116 schools in the sample. Of those questionnaires, 2,465 were eliminated from the sample for the reasons listed above, leaving a sample of 21,512 students. A total of 15,103 students returned questionnaires, yielding a 1993 response rate of 70%.

Response rates varied among the 130 colleges that participated in both 1993 and 1997. In the 1993 sample, response rates were between 18% and 100%, with 2 colleges having response rates below 45%. In the 1997 sample, response rates varied from 26% to 88%, and the response rate from 12 colleges was below 45%.

We used two procedures to examine potential bias introduced by nonresponders, examining the relationship of response rates to binge drinking at individual colleges. Response rates at individual colleges were not found to be

**TABLE 1**  
**Characteristics of the Student Samples, 1993 and 1997**

Characteristic	1993 sample ( <i>N</i> = 15,103) %	1997 sample ( <i>N</i> = 14,521) %	<i>p</i>
Gender			
Male	43	40	.001
Female	57	60	
Ethnicity			
Hispanic	7	8	.001
Non-Hispanic	93	92	
White	80	77	.001
Black/African American	5	5	.682
Asian/Pacific Islander	7	8	.001
Native American Indian/Native Alaskan	1	1	.435
Other	5	8	.001
Age			
< 24 y	83	83	.663
≥ 24 y	17	17	
Year in school			
Freshman	20	23	.001
Sophomore	20	21	.001
Junior	24	23	.163
Senior	26	22	.001
5th-y undergraduate or graduate student	10	11	.944

associated with the binge drinking rate. For the 1993 and 1997 samples, the Pearson correlation coefficients between a college's binge drinking rate and its response rate were  $-.02$  ( $p = .82$ ) and  $.06$  ( $p = .50$ ), respectively. We found no statistically significant difference in binge drinking rates between students who responded early and those who responded later in either 1993,  $\chi^2(1) = .75$ ,  $p = .39$ , or 1997,  $\chi^2(1) = .11$ ,  $p = .74$ .

### Data Analysis

We used the current (6.11) version of SAS<sup>11</sup> for statistical analyses. Comparisons of demographic and other characteristics between the two survey years were assessed using chi-square analysis. Differences in the prevalence of binge drinking were indicated by percentages, and tests of the significance of the differences of proportions were carried out using chi-square analysis. We also used this method to compare differences in rates of drinking styles and behavior problems and secondhand binge effects over the 4-year period.

We used logistic regression to assess how much higher the odds of an alcohol-related problem or behavior was for an infrequent binge drinker or for a frequent binge drinker, relative to a nonbinge drinker. When appropriate, we report odds ratios and 95% confidence intervals, adjusted for several epidemiologic controls, such as age, sex, and race.

We used the Generalized Estimating Equations (GEE)<sup>12,13</sup> approach because of our sampling scheme as a means of making more robust inferences using clustered outcomes. There were only three exceptions of  $p$  values that increased slightly beyond significance when controlling for clustering with GEE—the interaction between year and binge for the North Central region ( $p < .07$ ); students who usually binge when they drink, by survey year ( $p < .13$ ); and students who require medical treatment for an overdose, by survey year ( $p < .06$ ).

The significance of students who had a serious argument or quarrel increased ( $p < .04$ ) when we used the GEE. Most of the effect sizes (changes in proportions or odds ratios) we obtained from the GEE method were almost identical to

those obtained from the original analysis, whereas the standard errors were slightly larger. Hence, we have not reported the results in this article.

To facilitate comparisons between 1993 and 1997 data, we included only the 116 schools with relatively high response rates in both years in the data analysis reported here. Thus, the 1993 findings in some instances are slightly different from those previously reported in articles using the data for all 140 colleges in 1993.

## RESULTS

### Description of the Student Samples

Background characteristics of the 1993 respondents ( $N = 15,103$ ) and 1997 respondents ( $N = 14,521$ ) enrolled at one of the 116 participating US 4-year colleges are presented in Table 1. The sample includes more women than men in both 1993 (57%) and 1997 (60%); this is attributable, in part, to the inclusion in the surveys of 6 institutions for women only. The percentages are comparable to national data reporting that 54% of undergraduates at 4-year institutions in 1995 were women.<sup>14</sup> The sample was predominantly White (80% in 1993 and 77% in 1997), a proportion that corresponds to national data showing that 78% of students at 4-year institutions in 1995 were White.<sup>14</sup>

Students' year in school was distributed evenly among freshmen, sophomores, juniors, and seniors. The 1997 sample also included a small portion of undergraduates in their 5th year or beyond. Because of the large sample size, differences in the 1993 and 1997 samples were statistically significant on most demographic characteristics, although the absolute percentage differences were minor. The 1997 sample included more women, fewer Whites, and more freshman and sophomore students than the 1993 sample.

### Student Drinking Behavior

Drinking patterns of students in the 1993 and 1997 samples, not controlled for demographic composition, are shown in Table 2. In 1997, 2 of 5 students (42.7%) were binge drinkers, with equal proportions of occasional (21.9%) and frequent (20.7%) binge drinkers. One in 5 stu-

**TABLE 2**  
**College Student Patterns of Alcohol Use, by Gender, 1993 and 1997 (in Percentages)**

Category	Total		Men		Women	
	1993 ( $N = 15,103$ )	1997 ( $N = 14,521$ )	1993 ( $n = 6,430$ )	1997 ( $n = 5,778$ )	1993 ( $n = 8,611$ )	1997 ( $n = 8,701$ )
Abstainer (past y)	15.6	19.0	15.0	18.4	16.1	19.5
Nonbinge drinker†	40.3	38.3	34.9	33.3	44.3	41.7
Occasional binge drinker‡	24.6	21.9	27.8	24.7	22.2	20.1
Frequent binge drinker§	19.5	20.7	22.3	23.7	17.4	18.8

†Students who consumed alcohol in the past year but did not binge.

‡Students who binged one or two times in a 2-week period.

§Students who binged three or more times in a 2-week period.

**TABLE 3**  
**Changes in Prevalence of Binge Drinking, by Student Characteristics, 1993**

Characteristic	% binge drinkers		
	1993 ( <i>N</i> = 15,103)	1997 ( <i>N</i> = 14,520)	% change
All students	44.1	42.7	–3**
Gender			
Male	50.1	48.4	–4*
Female	39.6	38.9	–2
Ethnicity			
White	48.1	46.8	–3*
Black/African American	16.5	18.3	10
Asian/Pacific Islander	21.9	24.9	12
Other	38.3	37.4	–2
Hispanic	38.5	37.6	–2
Age			
< 24 y	47.2	45.5	–4**
≥ 24 y	28.4	28.5	—
Year in school			
Freshman	43.4	43.2	—
Sophomore	45.3	43.6	–4
Junior	44.2	44.2	—
Senior	43.9	41.3	–6*
Residence			
Dormitory	46.6	45.1	–4
Fraternity/ sorority house	83.5	81.1	–3
Off campus	40.6	40.1	–1
Fraternity/sorority member	67.0	65.0	–3
Binged in high school	69.5	70.6	2
Marital status			
Never married	47.2	45.5	–3**
Married	20.0	18.9	–6

*Note.* Chi-square comparisons of percentages of students who binge and year of survey, controlling for student subgroup, are not significant unless otherwise noted. \**p* < .05; \*\**p* < .01.

dents (19.0%) was an abstainer. Half of all students who drank any alcohol in the school year (53.0%) were binge drinkers.

A comparison of student drinking behavior in 1993 and 1997 reveals very little change in the 4-year interval: 42.7% were binge drinkers in 1997, a slight decrease from the 44.1% in 1993. As is common with samples of this size, the 3% decrease in binge drinking is statistically significant ( $p < .013$ ) in this univariate analysis. The decrease in binge drinking between 1993 and 1997, however, did not reach statistical significance when we controlled demographic characteristics, such as sex, ethnicity, and year in school in a multiple logistic regression ( $p = .31$ ).

The major change between 1993 and 1997 involves an increase in the proportion of abstainers from 15.6% to 19.0%. This 22% increase in abstention was statistically significant ( $p < .001$ ). By contrast, more students were frequent binge drinkers in 1997 than in 1993, a slight increase

from 19.5% to 20.7%. This 6% increase was significant at  $p < .02$ .

Individual binge drinking rates at the 116 colleges in 1997 ranged from zero at the school with the lowest level of drinking to 80% at the highest. Rates of binge drinking decreased at 64 colleges, increased at 44, and stayed the same at 8. At most colleges, the extent of change was relatively small. At 63 colleges, the rates of binge drinking changed by 5% or less. The change in binge drinking rates was statistically significant at 12 colleges, with significant decreases at 9 and significant increases at only 3 schools.

Changes in binge drinking between 1993 and 1997, by selected student characteristics, are shown in Table 3. The binge drinking rate of almost every student subgroup decreased by 1% to 6%. The only exceptions were increases in binge drinking among minority students: African American and Asian students had higher rates in 1997 than they did in 1993. We found statistically significant interac-

**TABLE 4**  
**Percentage Changes in Prevalence of Binge Drinking,**  
**1993 and 1997, by College Characteristics**

College characteristic ( <i>N</i> = 116)	<i>n</i>	% binge drinkers		
		1993	1997	% change
Commuter school†	18	29.9	30.8	3
Not commuter school	98	46.6	44.6	-4**
Not competitive‡	29	39.4	37.8	-4
Competitive	45	45.4	44.5	-2
Very competitive	27	48.7	46.8	-4
Highly competitive	14	41.1	39.6	-4
Small < 5,000	33	43.1	41.5	-4
Medium, 5,001–10,000	23	43.2	42.0	-3
Large > 10,000	60	44.9	43.5	-3
Public school	80	44.5	43.3	-3
Private school	36	43.2	41.3	-5
Northeast	26	51.2	46.1	-11***
South	34	43.1	40.9	-5*
North Central	34	47.1	47.4	—
West	22	33.0	33.7	-2
Religious affiliation	17	40.7	40.4	—
Nonreligious	99	44.7	43.1	-4**
Rural/small town	37	49.2	46.1	-6**
Suburban/urban	79	41.6	40.9	-2
Women only	6	28.9	30.6	6
Not women's college	110	44.6	43.4	-3*

*Note.* Chi-square comparisons of percentages of students who binge and year of survey, controlling for college subgroup, are not significant unless otherwise noted.

†Commuter schools were defined as schools with  $\geq 90\%$  of students living off campus.

‡Competitiveness is based on ACT and SAT scores and percentage of applicants accepted, as reported in *Barron's Profiles of American Colleges*.<sup>18</sup>

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

tions between survey year and ethnicity. Asian students had a greater increase in bingeing from 1993 to 1997 than all other students, with an odds ratio of 1.25 ( $p < .04$ ). In addition, White students showed a greater decrease in bingeing than all other students, with an odds ratio of 0.87 ( $p < .03$ ).

The student characteristics associated with higher binge drinking rates in 1993 were the same as those associated with higher rates in 1997. Students who were male, White, aged 23 years or younger, never married, belonged to fraternities or sororities, lived in fraternity or sorority houses, and bingeed in high school continued to have higher binge drinking rates than their respective counterparts. All differences are significant in multivariate logistic regression analysis ( $p < .001$ ).

Data in Table 4 show changes in binge drinking, by college characteristics. The binge drinking rates at most types of colleges decreased by 2% to 6%. The only exception was for schools in the Northeast, where the decrease in binge drinking rates was 11% ( $p < .001$ ). The only significant interaction between survey year and college characteristics was region. The Northeast had a greater decrease in binge

drinking than the other regions, with an odds ratio of 0.84 ( $p < .01$ ). In 1997, as in 1993, binge drinking rates at certain types of colleges—commuter schools, schools in the West, and all-women's colleges—were lower than those of other schools.

### Drinking Style

We also examined drinking style among students who drank alcohol in the past year. As the data in Table 5 indicate, significant increases occurred in frequency of drunkenness in the past 30 days, drinking to get drunk as a reason for drinking, and drinking on 10 or more occasions in the past 30 days. Drunkenness three or more times in the past month increased from 22.9% to 27.9% ( $p < .001$ ), and getting drunk as a reason for drinking increased from 39.4% to 52.3% ( $p < .001$ ). These increases occurred for both men and women.

### Prevalence of Alcohol-Related Problems

We also examined changes in the prevalence of each of 12 educational, interpersonal, health, and safety problems

**TABLE 5**  
**Drinking Styles of Students Who Consumed Alcohol, by Gender, 1993 and 1997, and Percentages of Change**

Drinking style	Total			Men			Women		
	1993	1997	% change	1993	1997	% change	1993	1997	% change
Drank on 10 or more occasions in the past 30 days	17.6	20.4	16***	23.8	28.1	18***	12.7	14.9	17***
Usually binges when drinks	40.1	41.5	4*	42.4	43.2	2 ( <i>ns</i> )	38.1	40.2	6*
Was drunk three or more times in the past month	22.9	27.9	22***	27.9	33.7	21***	18.8	23.8	27***
Drinks to get drunk†	39.4	52.3	33***	44.6	58.4	31***	35.4	48.2	36***

*Note.* Only students who drank alcohol in the past year are included. *ns* = not significant.

†Say that getting drunk is an important reason for drinking.

\* $p < .05$ ; \*\*\* $p < .001$ .

related to alcohol use among students who drank any alcohol in the past year. Data in Table 6 indicate that students exhibited higher rates for each of the problems in 1997 than in 1993. The extent of change was similar for men and women; for almost every problem, increases were statistically significant at  $p < .001$ . In 1997, 1 in 5 students experienced five or more different alcohol-related problems, an increase from 1993 of 22% ( $p < .001$ ). In 1997, more than one third of the students surveyed (35.8%) reported driving after drinking, a 13% increase from 1993 ( $p < .001$ ).

### Risk of Alcohol-Related Problems

In 1997, as in 1993, occasional binge drinkers and frequent binge drinkers manifested various alcohol-related problems at far higher rates than students who drank alcohol but did not binge. Data in Table 7, for example, indicate that frequent bingers were 8 or more times as likely to miss a class, fall behind in their schoolwork, forget where they were or what they did, get hurt or injured, and damage property. Occasional binge drinkers, in contrast to nonbinge drinkers, were 5 times as likely to experience 5 or more of the 12 different alcohol-related problems listed; frequent binge drinkers were 22 times as likely to do so.

### Secondhand Binge Effects

Secondhand binge effects were reported by students in 1997 at about the same rates as in 1993 (see Table 8). The most frequent problems cited were having study or sleep interrupted (60.6%), having to take care of a drunken student (50.2%), or being insulted or humiliated (28.6%).

As was true in 1993, 3 of 4 students (78.8%) reported that they had experienced at least one secondhand effect. The few statistically significant increases between 1993 and 1997 were mainly among women and included having a serious argument or quarrel, having to take care of a drunk student, and experiencing unwanted sexual advances.

### Secondhand Binge Effects at High-Binge, Medium-Binge, and Low-Binge Campuses

In 1997, as in 1993, students who did not binge drink but lived in dormitories or fraternities and sororities at high-binge colleges had a greater risk of experiencing secondhand effects of binge drinking than students attending low-binge colleges (Table 9). When we divided the colleges into three groups (high, medium, and low) on the basis of the binge drinking rates of students, we found that nonbinging students on high-binge campuses had a 5 times higher risk of experiencing at least 1 of the 8 secondhand effects that we examined. Students living at colleges with medium binge rates had a 3 times higher risk of experiencing at least 1 of these secondhand effects.

### COMMENT

#### A Cautionary Note About Student Surveys

The CAS uses self-reported responses to a mail survey. As such, it is subject to several sources of error. First, self-reported data may be subject to intentional or unintentional distortion, although a number of studies generally support the validity of self-report studies of alcohol use.<sup>15–17</sup>

Nonresponses may introduce another potential source of bias. Overall, response rates in 1997 were lower than those of schools surveyed in 1993. More schools had to be dropped from the comparison analyses in 1997 than in 1993 because of response rates of less than 45%. Statistical controls used to detect potential bias revealed no correlation between binge drinking rates at individual colleges and response rates. Furthermore, we compared early and late responders to the questionnaire and found no differences between the two groups. In addition, the levels of college binge drinking presented in this article are comparable to those found in several other large national surveys<sup>4–6</sup> of college populations. All have recently reported rates of binge drinking of about 40%.

**TABLE 6**  
**Prevalence of Alcohol-Related Problems Among College Students Since Beginning of Current School Year, 1993 and 1997**

Problem reported	Total % reporting problem			Men (%)			Women (%)		
	1993 (N = 12,803)	1997 (N = 11,798)	Change † (%)	1993 (n = 5,490)	1997 (n = 4,729)	Change † (%)	1993 (n = 7,274)	1997 (n = 7,028)	Change † (%)
Do something you regret	32.0	36.5	14	34.5	40.2	17	30.0	34.0	13
Miss a class	26.4	30.2	14	29.3	34.3	17	24.3	27.4	13
Forget where you were or what you did	24.3	26.7	10	27.5	30.0	9***	22.0	24.5	11
Get behind in school work	20.0	23.2	16	22.9	26.5	16	17.8	21.1	19
Argue with friends	19.4	23.5	21	22.1	26.3	19	17.4	21.7	25
Engage in unplanned sexual activity	19.0	22.5	18	22.6	26.9	19	16.3	19.5	20
Get hurt or injured	9.2	11.5	25	11.2	13.0	16**	7.8	10.5	35
Damage property	8.5	10.4	22	15.5	18.9	22	3.3	4.7	42
Not use protection when having sex	9.7	11.2	16	11.0	13.3	21	8.8	9.8	11*
Get into trouble with campus or local police	4.3	5.9	37	6.3	8.6	37	2.7	4.2	56
Require medical treatment of alcohol overdose	0.4	0.6	50*	0.6	0.6	ns	0.3	0.6	100***
Drove after drinking alcohol	31.6	35.8	13	39.7	44.3	12	25.5	30.0	18
Have five or more different alcohol-related problems	16.2	19.8	22	20.7	25.4	23	12.8	16.1	26

Note. Only students who drank alcohol in the past year are included. Sample sizes vary slightly because of missing values. ns = not significant. † For all percentages of change,  $p < .001$  unless otherwise indicated. \* $p < .05$ ; \*\* $p < .01$ .



**TABLE 7**  
**Risk of Alcohol-Related Problems Among Students in Different Binging Categories, 1997**

Problem reported	Nonbinge drinkers, % ( <i>n</i> = 5,489)	Occasional binge drinkers			Frequent binge drinkers		
		% ( <i>n</i> = 3,139)	Adjusted OR†	95% CI	% ( <i>n</i> = 2,967)	Adjusted OR‡	95% CI
Do something you regret	18	41	2.88	2.60–3.20	66	7.46	6.71–8.30
Miss a class	10	33	4.18	3.71–4.72	65	14.78	13.10–16.68
Forget where you were or what you did	10	29	3.47	3.07–3.93	56	10.25	9.09–11.55
Get behind in school work	9	25	3.05	2.69–3.47	48	8.43	7.45–9.53
Argue with friends	10	24	2.51	2.21–2.83	47	6.93	6.12–7.80
Engage in unplanned sexual activity	10	24	2.65	2.34–3.01	45	6.62	5.87–7.46
Get hurt or injured	3	11	3.22	2.67–3.88	27	8.79	7.39–10.45
Damage property	3	10	2.86	2.34–3.51	25	8.92	7.40–10.74
Not use protection when having sex	5	10	2.22	1.86–2.64	24	6.38	5.44–7.49
Get into trouble with campus or local police	2	5	2.58	1.97–3.37	15	7.82	6.17–9.90
Require medical treatment of alcohol overdose	< 1	1	<i>ns</i>	—	1	3.08	1.72–5.51
Drove after drinking alcohol	20	43	3.13	2.83–3.47	59	6.19	5.56–6.89
Have five or more different alcohol-related problems since the beginning of the school year	4	17	4.99	4.24–5.86	52	21.85	18.67–25.57

*Note.* Only students who drank alcohol in the past year are included. Problems did not occur at all or occurred one or more times. Sample sizes vary slightly for each category because of missing values. OR = odds ratio; CI = confidence interval; *ns* = not significant.

†Adjusted ORs of infrequent binge drinkers v nonbinge drinkers significant at  $p < .001$ .

‡Adjusted ORs of frequent binge drinkers v nonbinge drinkers significant at  $p < .001$  (OR adjusted for age, sex, marital status, race/ethnicity, and parents' college education).

## Findings and Implications

The results of the 1997 CAS point to a continuation of 1993 binge drinking rates of American college students. In both 1993 and 1997, 2 of 5 students were binge drinkers, despite much public attention to the problem and, at least, some stirrings of action on a number of campuses. It may be that it is too early for changes in behavior to occur and, as Anderson suggests in a personal communication (Anderson DS. Results of the 1997 College Alcohol Survey: Comparison with 1994 results and baseline year. June 16, 1998), the stirrings are not yet backed by resources.

For those looking for a glimmer of hope, the increase in the proportion of abstainers is significant. This may reflect the tendency for students who are less involved in a binge drinking lifestyle and for whom alcohol is not important to respond to alcohol education efforts and policies by giving up drinking completely. Although we also found a small overall decrease in the prevalence of binge drinking, this change was too small and still too tentative for celebration.

When we examined changes at the 116 individual colleges we found that a majority of colleges exhibited decreases in binge drinking rates, even though the decreases

were relatively small. At 9 schools, the decreases were significant, whereas at only 3 schools was the increase significant. A careful examination of colleges with significant decreases needs to be conducted (a) to see whether these changes continue or are one-time statistical artifacts, and (b) to determine what actions by the colleges may be associated with decreases.

At the same time, it appears that some intensification of drinking behavior is occurring among those students who drink alcohol. First, there is an increase, though small, in the prevalence of frequent binge drinking. Among drinkers, the prevalence of various alcohol-related problems, including some of the most serious (eg, driving after drinking, damaging property, and suffering personal injuries) has increased. In addition, the frequency of drunkenness among drinkers has increased during this period, and drinking to get drunk as a reason for using alcohol has increased dramatically.

These results point to a further polarization of alcohol users on college campuses. The numbers of students who binge drink and those who drink but do not binge are almost equal, with 2 of 5 students in each category. The numbers of abstainers and frequent drinkers are also almost equal, with

**TABLE 8**  
**Percentages of Nonbinge Drinking Students Reporting Secondhand Binge Drinking Effects, 1993 and 1997, by Gender**

	Total % reporting problem			Men			Women		
	1993 (n = 2,572)	1997 (n = 2,986)	Change (%)	1993 (n = 946)	1997 (n = 1,050)	Change (%)	1993 (n = 1,626)	1997 (n = 1,936)	Change (%)
Secondary effect									
Been insulted or humiliated	29.1	28.6	-2	31.9	30.6	-4	27.4	27.6	1
Had a serious argument or quarrel	16.7	18.6	11	18	17.4	-3	15.9	19.2	21**
Been pushed, hit, or assaulted	10.3	9.3	-10	12.6	9.9	-21*	8.9	9.0	1
Had your property damaged	11.5	12.9	12	15.2	17.9	18	9.4	10.2	9
Had to take care of drunken student	45.0	50.2	12***	44.6	47.4	6	45.2	51.7	14***
Had your studying/sleep interrupted	59.5	60.6	2	63.9	61.7	-3	56.9	60.0	5
Experienced an unwanted sexual advance†							19.9	23.3	17**
Been a victim of sexual assault or date rape‡							1.6	2.2	38
Experienced at least one of the above problems	77.8	78.8	1	79.4	78.3	-1	76.8	79.1	3

*Note.* Analyses are limited to nonbinge drinkers and abstainers who lived in dormitories or fraternity or sorority residences. Chi-square comparisons of percentages of students reporting problems are not significant unless otherwise noted.  
 †Analyses are based on responses of women only.  
 \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

**TABLE 9**  
**Risk of Experiencing Secondhand Binge Drinking Effects by Students at Low-, Middle-, or High-Level Binge Drinking Campuses**

Secondary effect	Low	Medium			High		
	% (N = 892)	% (N = 1,356)	Adjusted OR	95% CI	% (N = 938)	Adjusted OR	95% CI
Been insulted or humiliated	21	28	1.55	1.23–1.95	35	2.15	1.70–2.74
Had a serious argument or quarrel	15	17	<i>ns</i>		23	1.72	1.32–2.26
Been pushed, hit, or assaulted	8	9	<i>ns</i>		11	<i>ns</i>	
Had your property damaged	6	12	1.84	1.28–2.68	20	3.88	2.66–5.65
Had to take care of drunken student	37	50	1.72	1.41–2.10	60	2.64	2.13–3.26
Had your studying/sleep interrupted	40	62	2.46	2.02–3.00	74	4.36	3.49–5.44
Experienced an unwanted sexual advance†	20	22	<i>ns</i>		28	1.54	1.15–2.05
Been a victim of sexual assault or date rape†	2	3	<i>ns</i>		1	<i>ns</i>	
Experienced at least one of the above problems‡	61	81	2.82	2.27–3.60	89	5.32	4.06–6.96

*Note.* Analyses are limited to nonbinge drinkers and abstainers who lived in dormitories or fraternity or sorority residences. School binge levels were divided as follows: low binge  $\leq$  35%, middle level = 36%–50%, and high  $>$  50%. OR = odds ratio; CI = confidence interval. Adjusted ORs of students at schools with middle-level binge drinking v students at low-level schools are significant,  $<$  .05, and adjusted ORs of students at schools with high levels of binge drinking v students at schools with low levels are also significant,  $<$  .05 (OR adjusted for age, sex, marital status, race/ethnicity, and parents' college education).

†Analyses are based on responses of women only.

‡Available marital status was excluded from the adjusted OR.

*ns* = not significant.

1 in 5 students in each category. This split is bound to influence student responses to college alcohol policies.

Fraternities and sororities continue to be at the center of the campus alcohol culture. Despite highly publicized tragedies and continuing examinations of alcohol policies, 2 of 3 fraternity and sorority members are still binge drinkers. For those fraternity and sorority members who live in Greek houses, the statistics are even more extreme: 4 of 5 of these students are binge drinkers and half are frequent bingers.

If colleges are to have an impact on their alcohol problems, they must change this drinking culture drastically. Although Greek society members are only a small minority of the national college population, their influence is far greater. They serve as a center for social activities on many campuses; on some campuses, their numbers are relatively high.

A major determinant of college binge drinking is students' alcohol use while they were in high school. Binge drinking by high school seniors declined from a high of 41.4% in 1981 to a low of 27.5% in 1993. Since 1993, however, small rises in percentages have been reported in each year, with the level going to 31.3% in 1997.<sup>4</sup> Colleges have undoubtedly benefited from the earlier steady drop in

high school binge drinking, but they are bound to start experiencing the effects of the more recent rise in the near future.

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