College Students Define Binge Drinking and Estimate Its Prevalence: Results of a National Survey

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Abstract. Data from the 1999 College Alcohol Study were used to examine how students define the term *binge drinking*, to determine how much binge drinking the students think exists on their campuses, and to analyze how students' estimates compare with aggregated self-reports of student drinking. The findings indicate that the median of the students' definitions of binge drinking is 6 drinks in a row for men and 5 for women, 1 drink higher than the definition used by researchers. Students' definitions of binge drinking vary with their own drinking levels, suggesting that dissenting views of the research definition may represent voices of the heaviest drinkers. At the median, students estimated that 35% of all students were binge drinkers. Half (47%) of the students underestimated the binge drinking rate at their school, 29% overestimated it, and 13% were accurate. Although programs designed to reduce the frequency or prevalence of binge drinking by emphasizing healthier norms would be most useful in addressing binge drinkers who overestimate drinking norms, this group includes only 13% of college students.

Key Words: alcohol,binge drinking, college students, peer norms

With the growing recognition that binge drinking on college campuses constitutes a major public health problem, some college administrators are seeking effective interventions for their campuses.[1] One approach has concentrated on changing students' perceptions about the drinking practices and attitudes of their peers. This approach is based on a series of studies that have associated the alcohol use of friends and peers and a student's perception of that use with the student's own drinking patterns. Studies have found that students' consumption of alcohol is shaped, in part, by how much they think other students on campus drink.[2–5]

Adolescents' levels of alcohol and drug use have been found to be strongly associated with peers' use.[6,7] However, other studies have shown that a student's drinking was more strongly influenced by how much he or she thought close friends drank than by perceptions of the extent of use by students in general.[3,8,9] Personal drinking practices have been found to mirror those of the social group the student has lived with (eg, fraternities, sororities, and dormitories).[10–12]

Several studies have concluded that some students overestimate alcohol use among their friends and others on campus, and that this misperception may be associated with higher drinking levels.[2,4,5,9,13,14] If students perceive that heavy or binge drinking is the usual behavior of their peers, they may be more likely to engage in this behavior. Students who perceive that more drinking occurs than actually does provide themselves with an excuse for drinking more because "everyone is doing it." The results of these studies have been used to develop interventions aimed at adjusting student overestimates.[15,16]

Social norms programs attempt to influence students' choices about health behaviors by emphasizing the presence of an underlying, but under-emphasized and under-recognized pattern of healthy behavior. In broad terms, this approach assumes that students who otherwise overestimate campus drinking norms (and adjust their own behavior to match) may adopt a healthier pattern of behavior if they believe that such a pattern is normative. Such attempts to bring students' misperceptions about the levels of drinking on campus into line with campus drinking norms have gained popularity in recent years.

In a survey of college administrators' efforts to counter binge drinking, Wechsler et al[1] found that programs to reduce the gap between perceived and actual norms by educating students about how much drinking actually occurs have been put in place at 1 in 9 colleges (11%). However, measures and methods used in the studies underlying this new approach vary considerably, and the results are far from definitive. Most of the studies have been conducted at a single school rather than at a representative sample of different colleges.[2,6–8,12] Some studies

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focus on the frequency of drinking and not on the quantity consumed to measure the disparity,[15] whereas other studies examine students' perceptions of the disparity rather than considering measures of the disparity that researchers have developed.[2,3,13]

In the past decade, large-scale epidemiologic studies of youth alcohol use have employed 5 drinks in a row as a measure of heavy drinking, which has become a standard measure in both secondary school populations (the University of Michigan's National Institute of Drug Abuse-sponsored Monitoring the Future study)[17] and college populations (the Core Institute Survey[18] and theNational College Health Risk Behavior Survey[19]). The Harvard School of Public Health College Alcohol Study (CAS) has used a gender-specific definition of binge drinking: 5 drinks in a row for men and 4 drinks in a row for women.[20–23] Yet others disagree about the use of the 5 or 5-4 measure of binge drinking. The time period in which the drinking occurs is not specified in these studies, which use the measure as a marker for heavy episodic drinking and not as an indicator of blood-alcohol level.[24] Some opine that students consider this level of drinking low and insufficient for problems to occur. Yet no empirical studies have been designed to examine how students define binge drinking.

In this study, we examined students'perceptions of drinking at their colleges and attempted to relate the perceptions to the students' own drinking levels from a national perspective. Our purpose is to understand the following:

- students' definitions of binge drinking with respect to quantity of alcohol consumed and the factors associated with their definitions;
- students' perceptions of the extent of binge drinking on their campuses and how they compare with aggregated self-reports of drinking behavior;
- students' misperceptions of the extent of binge drinking on their campuses and the factors associated with their misperceptions.

The Harvard School of Public Health CAS provided us with the opportunity to extend the research on students'perceptions to a representative national sample of colleges and universities.

METHOD

College Sample

This study is based on the 1999 CAS survey. Responses from a randomly selected sample of 14 138 students at 119 nationally representative colleges in 40 states were used in these analyses. Details of the sample and research design have been described previously in this and other published reports.[21–23,25]

Questionnaire

The 1999 survey repeated standard questions used in the 1993 and 1997 CAS surveys.[21,22] The 20-page self-administered questionnaire asked about alcohol use, other substance use, student attitudes and lifestyles, and requested background characteristics. The questionnaire instructed students 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 of liquor (1.25 oz or 37 mL), either straight or in a mixed drink. The questions were adapted from previous large-scale, national studies.[18,22,26]

Measures

Alcohol-related Health and Behavioral Problems

Students were asked if they had encountered any of 12 health and behavioral consequences as a result of their drinking since the beginning of the school year. Students were classified by whether they reported five or more different problems. This measure has been used by the CAS to indicate a high level of alcohol problems.

Binge Drinking

Heavy episodic or binge drinking was defined as the consumption of at least 5 drinks in a row for men or 4 drinks in a row for women during the 2 weeks preceding their completion of the questionnaire. The CAS gender-specific measure of binge drinking was constructed from responses to four questions: (a) sex; (b) recency of last drink; (c) drinking 5 or more drinks during the past 2 weeks; and (d) drinking 4 or more drinks during the past 2 weeks. Missing data for any of these questions resulted in excluding that student's responses from the analysis. *Frequent binge drinkers* had binged three or more times in the past 2 weeks, *occasional binge drinkers* had done so only once or twice in the same time period. *Nonbinge drinkers* had consumed alcohol in the past year but had not binged in the previous 2 weeks, whereas *abstainers* had not consumed any alcohol in the past year.

College Binge Drinking Rates

The college binge drinking rate of a school was the percentage of students classified as binge drinkers at that school. It was calculated for each school on the basis of the aggregated self-report responses of students at their schools to the binge drinking questions. Colleges were divided into three categories according to their binge drinking rates: *high-binge schools*, more than 50% of students were binge drinkers; *medium-binge schools*, 36% to 50% of the students were binge drinkers; and *low-binge schools*, where from 0% to 35% of the students were binge drinkers. These same groupings have been the basis of CAS studies of secondhand effects of drinking.[23]

Students'Definitions of Binge Drinking

Students were asked to respond to the question "How many drinks in a row must a college (man)/(woman) have in order to be called binge drinker?" Responses, to be provided for men and women separately, were 3 or less, 4, 5, 6, 7, 8, 9, and 10 or more. The question paralleled the CAS measure of binge drinking and did not specify a time period.

Students' Perceptions of Binge Drinking Rate on Campus

Students were asked: "Based on what you have heard or experienced, approximately what proportion of the following do you think are binge drinkers at your school?" The question was asked separately for "all students" and for "your friends." Respondents were given a choice of 12 response categories: 0%, 1%–9%, 10%–19%, 20%–29%, 30%–39%, 40%–49%, 50%–59%, 60%–69%, 70%–79%, 80%–89%, 90%–100%, and "don't know."

To measure the discrepancy between students' perceptions of the binge drinking rates at their schools and college binge drinking rates, we collapsed the latter into the same 12 categories. *Accuracy* was attained if students' perceptions of the binge drinking rates at their schools matched the college binge drinking rates; an *underestimate* occurred if students'perceptions of the binge drinking rates were lower than the college binge drinking rates, and an *overestimate* occurred if students'perceptions of the binge drinking rates were higher than the binge drinking rates at their schools.

Finally, we calculated and compared two measures. We computed a mean score of students'perceived binge drinking rates at each school by averaging all of the students' estimates of binge drinking at their schools. The midpoint of each response category was used to calculate the mean (for example, 35% if the student chose the category of 30%–40%). We compared this perceived rate with the college binge drinking rate that was based on the percentage of students actually classified as binge drinkers at that school. The school was rated *accurately* if the difference between these two measures was less than 10%; *underestimated* if the mean perceived rate was 10% or more lower than the college binge drinking rate, and *overestimated* if the mean perceived rate was 10% or more higher than reality.

Data Analysis

We used contingency tables to present students' definitions of binge drinking for men and for women, students' perceptions of alcohol problems on campus, students' perceptions of binge drinking rates among their friends and all students on campus, and the discrepancy between students' perceived binge drinking rates and the college binge drinking rates. We chose the median as the measure of central tendency in estimating students' definitions of binge drinking because the data were not symmetric.[27] The median is also often the preferred measure of central tendency to identify the middle of the distribution for ordinal response categories.[28]

We conducted four multiple logistic regression models to examine the association between types of drinkers and the discrepancy between students' perceived binge drinking rates and the college binge drinking rates (defined as *accurate, underestimate, overestimate,* and *don't know*), adjusting for other covariates. We used Generalized Estimating Equations (GEE)[29,30] for robust inferences on the estimated coefficients of the multiple logistic regression models, using clustered binary outcomes arising from the sampling. The exchangeable covariance structure seemed the best specification and was specifically indicated through the GEE.

RESULTS

Students' Definitions of Binge Drinking

Students have a gender-specific definition of binge drinking (Table 1) and indicate that a woman needs to consume fewer drinks than a man to be called a binge drinker. The median number of drinks in a row that a college man or woman must have to be called a binge drinker is 6 for a man and 5 for a woman. The definition is positively associated with the drinking level of the respondent. Thus, for abstainers, the median number of drinks in a row needed for a man is 5, for nonbinge drinkers it is 6, for occasional binge drinkers it is 7, and for frequent binge drinkers it is 8. The median number of drinks in a row for women is 4 for abstainers, 5 for nonbinge drinkers, 5 for occasional binge drinkers, and 6 for frequent binge drinkers.

We conducted multiple logistic regression (controlling for race and ethnicity) to examine whether students who define binge drinking as a higher number of drinks in a row are more likely to have five or more alcohol-related problems during the past year. We found that students who defined binge drinking for a man as more than 5 drinks in a row are more likely to have five or more alcohol-related problems, odds ratio (OR) = 1.7 (1.47–1.85). Similarly, we found that students who defined binge drinking for a woman as more than 4 drinks in a row are more likely to have five or more alcohol-related problems, OR = 1.4 (1.3–1.6).

Students' Perceptions of Alcohol Problems on Campus

The extent to which students perceived alcohol problems to be present on their campuses are shown in Tables 2A and B. For analysis, we used major problem or problem in contrast to minor problem or not a problem. The students' view that a campus alcohol problem existed was positively associated with the level of binge drinking at that school. Overall, 41% of students at low-binge schools, 45% at medium-binge schools, and 55% at high-binge schools considered alcohol use to be a problem on their campuses. Students' perceptions also varied with their own drinking patterns. At low-binge schools, 49% of the abstainers and 26% of the frequent binge drinkers perceived their peers' alcohol use to be a problem on campus. At medium-binge schools, 67% of the abstainers and 31% of the frequent binge drinkers viewed students' alcohol use as a problem, whereas 83% of the abstainers and 40% of the frequent binge drinkers at high-binge schools perceived students' alcohol use to be a problem.

Students' Perceptions of Their Friends' Binge Drinking

A strong relationship exists between students' perceptions of their friends'binge drinking and their own drinking. Students are likely to report that their friends drink at the same level as they do (Table 3). Although few abstainers

(7%) and nonbinge drinkers (12%) estimated that half or more of their friends were binge drinkers, progressively more of the occasional binge drinkers (27%) and frequent binge drinkers (52%) did so. In the two highest drinking groups, 3 in 8 (37%) members of sororities or fraternities and 1 in 3 (32%) intercollegiate athletes estimated that half or more of their friends were binge drinkers.

Students' Perceptions of the Binge Drinking Levels on Campus

Nationally, more than half of the students (59%) indicated that the binge drinking rates at their schools were under 50% (Table 4). The students' perceptions of binge drinking rates varied with a schools' binge drinking level. Two in 3 (66%) of the students at low-binge schools and 1 in 2 (52%) of the students at high-binge schools perceived the binge drinking rate on campus to be under 50%. Students at low-binge schools were more likely to indicate that they did not know what the rate was (15.8%), compared with students at medium-binge (11.5%) and high-binge schools (6.0%).

Discrepancy Between Students' Perceptions of Binge Rates and College Binge Rates

Comparisons of students' perceived binge drinking rates on campus with the college binge drinking rates by type of drinkers and type of schools are shown in Table 5. In general, 47% of the students underestimated the binge drinking rates at their schools, whereas 29% overestimated the levels, and 13% were accurate, within 10%. Twelve percent of the students indicated that they did not know the binge drinking rates in their schools.

Using multiple logistic regression models, we examined the association between type of drinker and the discrepancy between students' perceived binge drinking rates and college binge drinking rates, adjusting for drinking level of school, sex, age, ethnicity, public/private school, commuter/noncommuter school, and school enrollment. The analysis indicated that abstainers and frequent binge drinkers are significantly more likely than nonbinge drinkers to be accurate in their perceptions, OR = 1.3 (1.08–1.51) and 1.2 (1.08–1.43), respectively.

Frequent binge drinkers are significantly more likely than nonbinge drinkers to overestimate campus binge drinking rates, OR = 1.4 (1.27–1.62). Abstainers and frequent binge drinkers are less likely than nonbinge drinkers to underestimate the binge drinking rates at their schools, OR = 0.7 (0.57–0.82), and OR = 0.8 (0.72–0.87), respectively. Furthermore, abstainers are more likely than nonbinge drinkers to answer "don't know," whereas occasional and frequent binge drinkers are less likely to say that they do not know about the binge drinking rates at their schools, OR = 1.2 (1.05–1.45), OR = 0.7 (0.57–0.76), and OR = 0.6 (0.52–0.70), respectively.

For a comparison of the college binge drinking rate at

TABLE 1
Students'Definitions of Binge Drinking for Men and for Women, by Type of Drinker

			Type of drinker							
	Total		Abstainer		Nonbinge		Occasional binge		Frequent binge	
Drinks in a row (*n*)	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %
				For men						
≤ 3	4.3	4.3	12.1	12.1	3.5	3.5	1.8	1.8	1.2	1.2
4	9.7	14.0	18.5	30.6	10.6	14.1	6.0	7.8	4.5	5.7
5	19.5	33.5	24.8	55.4	22.3	36.4	15.9	23.7	14.0	19.7
6	16.8	50.3	18.2	73.6	19.7	56.1	16.2	39.9	11.7	31.4
7	11.5	61.7	8.8	82.4	12.1	68.2	13.3	53.2	10.9	42.3
8	12.1	73.8	6.7	89.1	11.8	80.0	14.8	68.0	14.4	56.7
9	4.5	78.3	1.7	90.8	4.0	84.0	5.9	73.9	6.5	63.2
≥ 10	21.7	100.0	9.3	100.0	16.0	100.0	26.1	100.0	36.7	100.0
				For women						
≤ 3	10.6	10.6	23.1	23.1	10.1	10.1	6.0	6.0	5.3	5.3
4	23.5	34.1	32.0	55.1	25.4	35.5	19.1	25.1	17.6	22.9
5	21.9	56.0	21.6	76.7	24.5	60.0	22.0	47.1	18.0	40.9
6	16.9	72.9	12.2	88.9	17.7	77.7	19.8	66.9	16.6	57.5
7	9.5	82.4	4.4	93.3	8.6	86.3	11.8	78.7	13.2	70.7
8	7.7	90.1	2.8	96.1	6.4	92.7	9.7	88.4	11.9	82.6
9	2.1	92.2	0.6	96.7	1.5	94.2	2.6	91.0	3.7	86.3
≥ 10	7.8	100.0	3.3	100.0	5.9	100.0	9.1	100.0	13.7	100.0

Note. Cum = cumulative percentage.

each school to the mean of students' perceived binge drinking rates at that school, see Table 6. The level of agreement is high, with a correlation of $r = .76$. At 68 schools, the mean of students' perceived binge drinking rates and the college binge drinking rates match. We classified the responses at these schools as accurate because both rates are in the same decile. At 41 schools, the students' perceptions are an underestimate of the college binge drinking rate, and at 10 schools the students' perceptions are an overestimate of the college binge drinking rate.

COMMENT

Findings and Discussion

We used survey data from a 1999 representative sample of more than 14 000 students enrolled at 119 colleges in 40 states to examine students' views about binge drinking on their campuses. The study examined how students define the term *binge drinking,* whether they consider it a problem on their campus, and how prevalent they think binge drinking is at their schools.

The findings are striking. At the median, half of the students define the term *binge drinking* as 6 drinks or fewer in a row for men and 5 drinks or fewer in a row for women. Students define the term on the basis of how much they themselves drink. Abstainers consider the definition to be 5 drinks in a row for men and 4 for women, whereas frequent binge drinkers use the higher limits of 8 and 6 drinks, respectively. One in three frequent binge drinkers defines binge drinking as 10 or more drinks in a row for men.

The median of students' definitions of binge drinking is one drink higher than that used by the CAS and other studies. Furthermore, all students, regardless of their drinking

TABLE 2-A
Students' Perceptions of Alcohol Problems on Campus, in Percentages, by Type of Drinker

		Student drinker classification			
Problem	Total	Abstainer	Nonbinge	Occasional binge	Frequent binge
Major problem	11.6	21.9	12.5	6.9	5.6
Problem	35.6	40.1	39.0	32.3	29.3
Minor problem	35.9	25.0	33.5	42.2	42.9
Not a problem	17.0	13.1	14.9	18.6	22.2

TABLE 2-B
Students' Perceptions of Alcohol Problems on Campus, in Percentages, by Type of School

		Student drinker classification			
Problem	Total	Abstainer	Nonbinge	Occasional binge	Frequent binge
Low-binge school (≤ 35%)					
Major problem	8.7	13.3	7.3	5.8	4.4
Problem	31.9	35.9	34.0	26.3	21.4
Minor problem	35.7	27.7	36.4	40.9	43.0
Not a problem	23.7	30.0	22.2	27.1	31.2
Medium-binge school (36%–50%)					
Major problem	10.2	21.5	11.8	4.1	4.1
Problem	34.8	45.3	37.5	29.2	26.9
Minor problem	36.8	24.6	35.4	43.3	42.7
Not a problem	18.2	8.7	15.4	23.4	26.3
High-binge school (> 50%)					
Major problem	15.3	41.1	19.7	10.4	7.0
Problem	39.2	41.4	47.1	38.3	32.7
Minor problem	34.9	14.8	27.2	41.5	43.0
Not a problem	10.6	2.7	6.0	9.9	17.4

levels, have a gender-specific definition, indicating that it takes fewer drinks for a women than for a men to be a binge drinker. This should offer encouragement to those working to decrease the level of alcohol abuse and related problems on campus. The students' definitions make it highly unlikely that those students' voices, which have been reported as rejecting a 5-4 measure, represent all students. More likely, they are drawn from among the heaviest drinkers.

It is not surprising that frequent binge drinkers, who account for two thirds of all the alcohol college students drink and for three fifths of the most serious alcohol-related problems on campus,[31] would consider 5 or 4 drinks in a row too small. Unfortunately, some college administrators and intervention program directors may be swayed by the voices of these students. Alcohol programs and policies need to be geared to all students and not just the heaviest drinking group.

Our findings indicated that whether or not students perceive alcohol use to be a problem on their campuses is related to the students' own drinking behaviors as well as to the levels of drinking on their campus. Overall, about half of all students, a majority of abstainers and nonbinge drinkers, and a minority of occasional and frequent binge drinkers, consider students' alcohol use on their campus to be a problem. The interplay of these factors is extremely strong. More than 4 in 5 abstainers on high-binge campuses and 1 in 4 frequent binge drinkers on low-binge campuses consider alcohol use to be a problem on their campuses. The majority of all students on high-binge campuses and the

TABLE 3
Students' Estimates of the Percentage of Binge Drinkers Among Their Friends, by Type of Drinker

	Total		Abstainer		Nonbinge		Occasional binge		Frequent binge		Greek frat mbr		Athlete	
Response (%)	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %
0–9	44.8	44.8	66.1	66.1	56.7	56.7	33.9	33.9	18.1	18.1	30.0	30.0	35.6	35.6
10–19	9.6	54.4	8.0	74.1	10.6	67.3	11.4	45.3	7.8	25.9	9.7	39.7	9.9	45.5
20–29	7.2	61.6	4.8	78.9	7.2	74.5	9.8	55.1	6.7	32.6	7.8	47.5	7.8	53.3
30–39	5.5	67.1	3.5	82.4	4.7	79.2	7.5	62.6	6.6	39.2	7.0	54.4	6.9	60.2
40–49	4.3	71.4	2.5	84.9	3.1	82.3	6.4	69.0	5.6	44.8	6.2	60.6	5.0	65.2
50–59	5.5	76.9	2.4	87.3	4.0	86.3	8.0	77.0	8.1	52.9	7.4	68.0	7.4	72.6
60–69	4.0	80.9	1.3	88.6	2.4	88.7	5.0	82.0	7.7	60.6	6.0	74.1	5.8	78.4
70–79	4.7	85.6	1.2	89.8	1.9	90.6	5.8	87.8	10.8	71.4	7.9	82.0	6.7	85.1
80–100	9.2	94.8	1.8	91.6	3.3	93.9	8.5	96.3	25.8	97.2	15.5	97.4	12.0	97.1
Don't know	5.3	100.0	8.4	100.0	6.1	100.0	3.7	100.0	2.8	100.0	2.6	100.0	2.9	100.0

Note. Cum = cumulative percentage.

TABLE 4
Students' Estimates of the Percentage of Binge Drinkers in Their School, by Type of School

			School					
	Total		Low-binge (≤ 35%)		Medium-binge (36%–50%)		High-binge (> 50%)	
Response (%)	%	Cum %	%	Cum %	%	Cum %	%	Cum %
0–9	8.2	8.2	16.1	16.1	7.5	7.5	3.1	3.1
10–19	11.7	19.8	13.2	29.3	13.1	20.6	8.9	12.0
20–29	14.4	34.2	15.1	44.4	15.3	35.9	12.7	24.7
30–39	16.0	50.2	14.0	58.4	16.6	52.5	16.6	41.3
40–49	9.2	59.4	7.6	66.0	9.0	61.5	10.8	52.1
50–59	10.3	69.7	7.4	73.4	10.4	71.9	12.4	64.5
60–69	9.7	79.4	5.5	78.9	8.7	80.6	14.1	78.6
70–79	6.7	86.1	3.7	82.6	5.4	86.0	10.5	89.1
80–100	3.2	89.3	1.7	84.3	2.6	88.6	5.1	94.2
Don't know	10.7	100.0	15.8	100.0	11.5	100.0	6.0	100.0

Note. Cum = cumulative percentage.

TABLE 5
Discrepancies Between Students' Perceptions of Binge Drinking Rate and the College Drinking Rate, in Percentages, by Type of Drinker and by Type of School

Responder %	Accurate %	Underestimate %	Overestimate %	Don't know %
Total (n = 13 189)	13.1	46.5	28.8	11.6
Type of drinker				
Abstainer (n = 2659)	15.2	36.2	31.8	16.9
Nonbinge drinker (n = 5063)	11.9	46.4	27.7	14.0
Occasional binge drinker (n = 2962)	12.2	53.4	26.4	8.1
Frequent binge drinker (n = 3135)	14.1	49.2	30.1	6.6
Type of school				
Low binge (n = 3586)	16.6	26.8	39.4	17.3
Medium binge (n = 5799)	10.7	48.2	28.3	12.8
High binge (n = 4753)	13.1	58.9	21.1	7.0

minority of students on low-binge campuses report a campuswide alcohol problem.

When students were asked to estimate the extent of binge drinking on their campuses, the median response was 35% (mid-point of 30%–39%). Almost half of the students underestimated the binge drinking rates, and 3 in 10 overestimated it. We found more overestimation at low-binge schools and more underestimation at high-binge schools. When individual schools are examined, students' perceptions tend to be highly accurate. In the case of 60% of the colleges, the students' estimates of the binge drinking rates were within 10% of the rates obtained from students' self-reports. At 32% of the schools, the students underestimated the campus binge drinking level, and at 8%, the students overestimate the level. These findings suggest that students have a greater understanding of the extent of binge drinking at their schools than they are given credit for. Furthermore, schools may have "reputations" that are at least to some extent accurate.

Proponents of the social norms approach aimed at redefining the campus drinking norm have indicated that students generally overestimate the level of consumption and drink more because they think that most students are doing it. This widely held assumption is contradicted by the findings that show that, from a national perspective, half of the students (47%) underestimate and only 29% overestimate the binge drinking rate on campus. Furthermore, binge drinkers who overestimate the level of alcohol use on their campuses account for only 3 in 10 (29%) binge drinkers but only 1 in 8 students (13%) in the sample.

Students who overestimate binge drinking rates on their campuses are more likely to be binge drinkers. Thus, programs to redefine campus drinking norms may be a useful technique to reduce alcohol abuse on campus for this group. However, the size of this group nationally must be viewed in gauging the potential effect of this approach. Furthermore, it is noteworthy that half of all binge drinkers underestimate the extent of binge drinking on their campuses. In addition, 1 in 6 (17%) abstainers and 1 in 8 nonbinge drinkers indicated that they did not know about the binge drinking rate on their campus.

TABLE 6
Discrepancies Between College Binge Drinking Rate and Mean of Students' Perceived Drinking Rate (119 Schools)

Estimate	n	%
Accurate	68	60.5
Underestimate	41	31.9
Overestimate	10	7.6

We should consider the consequences of such a norms redefinition campaign for nonbinge drinking students and abstainers who do not know or who underestimate the extent of binge drinking on their campus. The effect of learning the binge drinking rate of their college on their own drinking behavior should be carefully examined. Different approaches to prevention are also needed to keep students from joining the ranks of binge drinkers and to reduce binge drinking levels and associated problems.

A Cautionary Note About Student Surveys

The CAS is based on self-reported responses to a mail survey and is subject to sources of error associated with this approach. Although respondents may intentionally or unintentionally distort their answers, a number of studies support the validity of self-reports of alcohol use.[32–34] Furthermore, the same pattern of responses among different student subgroups is present in all 3 years of the study[21–23] as well as in other major studies of college alcohol use.[18,19,35] Bias may also be introduced through sample

attrition or nonresponse. Statistical controls used to examine potential bias, however, revealed no association between students' nonresponses and binge drinking rates.

Students' definitions of binge drinking are obtained without specification of the time period during which the drinking occurs. This is done because the rates of binge drinking are also obtained without reference to a time period. The strong correlation of the 5-4 measure without a time specification to alcohol-related problems and secondhand effects makes this an important indicator of the type of alcohol use that produces problems for the drinker and others on campus.

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NOTE

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REFERENCES

1. Wechsler H, Kelley K, Weitzman ER, San Giovanni JP, Seibring M. What colleges are doing about student binge drinking: A national survey of college administrators. *J Am Coll Health.* 2000;48:219–226.

2. Perkins HW, Berkowitz AD. Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *Int J Addict*. 1986; 21:961–976.

3. Baer JS, Stacy A, Larimer M. Biases in the perception of drinking norms among college students. *J Stud Alcohol.* 1991; 52:580–586.

4. Wood MD, Nagoshi CT, Dennis DA. Alcohol norms and expectations as predictors of alcohol use and problems in a college student sample. *Am J Drug Alcohol Abuse.* 1992;18:461–476.

5. Mäkelä K. Drinking, the majority fallacy, cognitive dissonance and social pressure. *Addictions.* 1997;92:729–736.

6. Downs WR. A panel study of normative structure, adolescent alcohol use and peer alcohol use. *J Stud Alcohol*. 1987;48:167–175.

7. Perkins HW. Religious traditions, parents, and peers as determinants of alcohol and drug use among college students. *Review of Religious Research.* 1985;27:15–31.

8. Baer JS, Carney MM. Biases in the perceptions of the consequences of alcohol use among college students. *J Stud Alcohol.* 1993;54:54–60.

9. Thombs DL, Wolcott BJ, Farkash LGE. Social context,perceived norms and drinking behavior in young people. *J Substance Abuse.* 1997;9:257–267.

10. Berkowitz AD, Perkins HW. Problem drinking among college students: A review of recent research. *J Am Coll Health.* 1986;35:21–28.

11. Wechsler H, Dowdall GW, Davenport A, Castillo S. Correlates of college student binge drinking. *Am J Public Health.* 1995;7:921–926.

12. Larimer M, Irvine D, Kilmer JR, Marlatt GA. College Drinking and the Greek System: Examining the role of perceived norms for high-risk behavior. *Journal of College Student Development.*1997; 38:587–598.

13. Perkins HW, Meilman PW. Leichliter JS, Cashin JS, 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.

14. Prentice DA, Miller DT. Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *J Pers Soc Psychol.* 1993;45:134–140.

15. Agostinelli G, Brown JM, Miller WR. Effects of normative feedback on consumption among heavy drinking college students. *J Drug Education.* 1995;25,31–40.

16. Haines M, Spear SF. Changing the perception of the norm: A strategy to decrease binge drinking among college students. *J Am Coll Health.* 1996;45:134–140.

17. Johnston LD, O'Malley PM, Bachman JG. *National Survey Results on Drug Use From the Monitoring the Future Study, 1975–1995; Vol II,College Students and Young Adults.* US Dept of Health and Human Services; NIH publication #98-4140;1997.

18. Presley CA, Meilman PW, Cashin JR, Lyerla R. *Alcohol and Drugs on American College Campuses: Use, Consequences, and Perceptions of the Campus Environment, Vol IV, 1992–94.* Carbondale, IL: Southern Illinois University; 1996.

19. Douglas KA, Collins JL, Warren C, et al. Results from the 1995 National College Health Risk Behavior Survey. *J Am Coll Health*. 1997;46:55–66.

20. Wechsler H, Dowdall G, Davenport A, Rimm E. A gender-specific measure of binge drinking among college students. *Am J Public Health*. 1995;85:982–985.

21. Wechsler H, Davenport A, Dowdall G, Moeykens B, Castillo S. Health and behavioral consequences of binge drinking in college: A national survey of students at 140 colleges. *JAMA.* 1994;272:1672–1677.

22. Wechsler H, Dowdall GW, Maenner G, Gledhill-Hoyt J, Lee H. Changes in binge drinking and related problems among American college students between 1993 and 1997. *J Am Coll Health*. 1998;47:57–68.

23. Wechsler H, Lee JE, Kuo M, Lee H. College binge drinking in the 1990s:A continuing problem:Results of the Harvard School of Public Health 1999 College Alcohol Study. *J Am Coll Health.* 2000;48:199–210.

24. Wechsler H, Austin SB. Binge drinking: The five/four measure. *J Stud Alcohol.* 1998;59:122–124.

25. Wechsler H, Kuo M, Lee H, Dowdall GW. Environmental correlates of underage alcohol use and related problems of college students. *Am J Prev Med*. 2000;19:24–29. In press.

26. Wechsler H, Isaac N. "Binge" drinkers at Massachusetts colleges: Prevalence, drinking style, time trends, and associated problems. *JAMA.* 1992;267:2929–2931.

27. Rosner B. *Fundamentals of Biostatistics.* 3rd ed. Boston: PWS-KENT; 1990.

28. Jaeger R. *Statistics: A Spectator Sport.* 2nd ed. Newbury Park, CA: Sage; 1990.

29. Liang KY, Zeger SL. Longitudinal data analysis using generalized linear models. *Biometrika.* 1992;73:12–22.

30. Zegar SL, Liang KY, Albert PS. Models for longitudinal data: A generalized estimating equation approach. *Biometrics*. 1988;4:1049–1060.

31. Wechsler H, Molnar BE, Davenport AE, Baer JS. College alcohol use: A full or empty glass? *J Am Coll Health.* 2000; 47:247–252.

32. Frier MC, Bell RM,Ellickson PL. *Do Teens Tell the Truth? The Validity of Self-Report Tobacco Use by Adolescents*. Santa Monica, CA: RAND; 1991. RAND publication N-3291-CHF.

33. Cooper AM, Sobell MB, Sobell LC, Maisto SA. Validity of alcoholics' self-reports: Duration data. *Int J Addict*. 1981; 16:401–406.

34. Midanik L. Validity of self-report alcohol use: A literature review and assessment. *Brit J Addict*. 1988;83:1019–1030.

35. Youth risk behavior surveillance: National College Health Risk Behavior Survey United States. *MMWR*. 1997;46(SS-6):1–54.

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