

Trends in Alcohol Consumption Among Undergraduate Students at a Northeastern Public University, 2002–2008

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Abstract. Objective: This study examined alcohol consumption patterns and trends at a public university in the Northeast from 2002 to 2008. **Participants:** Stratified random sampling was used to select undergraduate students enrolled in courses during spring semesters in 2002, 2004, 2006, and 2008. **Methods:** Data were collected during regularly scheduled classes for 4 measures of alcohol consumption and 5 demographic categories using the Core Alcohol and Drug Survey. **Results:** Four groups showed significant increases in both frequency and volume of alcohol consumption—students who were female, over 21 years of age or over, living off-campus, or performing well academically. There were no decreasing trends for any demographic group. These results differ from national college health surveys, which have shown alcohol use remaining steady during this period. **Conclusions:** Campus-specific trend data can provide unique perspectives and guide programming efforts. These trends suggest a need for new intervention strategies on this campus.

Keywords: alcohol consumption, drinking, college, trends

Alcohol use is high among college students and places them at risk for health problems, injuries, and poor academic performance.^{1–3} Data from the American College Health Association's National College Health Assessment (ACHA-NCHA) indicate that in fall 2007, 61.8% of students reported consuming alcohol during the previous 30 days and 33.5% reported heavy drinking (5 or more drinks at one sitting) during the previous 2 weeks.⁴ The 2006

Core Alcohol and Drug Survey reported even higher rates at 71.8% and 46.7%, respectively.⁵ As a consequence of drinking during the previous year, 22.8% of students reported they had done something they later regretted, 19.2% had forgotten where they were or what they did, 11.2% had physically injured themselves, 10.4% reported having had unprotected sex, and 21.1% indicated they had driven a car after drinking during the previous 30 days.⁴ Academically, 22.1% of students reported they had performed poorly on a test or project and 30.1% reported they had missed class as a consequence of drinking or drug use during the previous year.⁵

Colleges have made considerable efforts to address illegal and excessive alcohol consumption. In a 2002 survey of administrators from 747 4-year colleges with residential housing Wechsler et al⁶ reported that 34% had alcohol-free campus environments, 43% had alcohol alcohol-free residence halls, 84% provided alcohol education to freshmen, and 49% had conducted a social norms marketing campaign to reduce alcohol consumption. Additionally, 90% of schools provided counseling and treatment services, 81% employed an assigned substance abuse official, 61% had established a task force, and 48% had cooperative agreements with substance abuse-related community agencies. Public schools and schools located in the Northeast were more likely than other campuses to have invested in institutional prevention efforts and to have obtained public funds for those initiatives.⁶

Despite considerable college alcohol prevention programming, national data for the current decade indicate that consumption and heavy drinking among college students have remained relatively constant, with similar trends for men and women.^{7,8} According to the Monitoring the Future Survey, trends in college alcohol consumption decreased slightly between 1980 and 1999.⁹ More recent data from the ACHA-NCHA survey, however, indicate that 30-day prevalence and

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heavy drinking has remained relatively constant since 2004.⁷ Between 2004 and 2007, the respective percentages of students reporting alcohol consumption during the previous 30 days were 65%, 67%, 66%, and 62% for men and 65%, 66%, 65%, and 62% for women.⁷ The percentages reporting drinking 5 or more drinks at one sitting during the previous 2 weeks was 42%, 46%, 47%, and 42% for men and 31%, 32%, 32%, and 29% for women during this same 4-year period.⁷ Consistent across these national college alcohol surveys, males report drinking more often and at higher volumes than females and White students report drinking more than Black or Hispanic students.⁹

National data provide broad perspectives on college alcohol consumption patterns and trends. These large databases can be very helpful for informing policy decisions, establishing national goals and objectives, and providing benchmarks against which similar institutions can compare their data. Notably, the types of institutions represented in national samples can shift from year to year and introduce extraneous variables such as the quantity and quality of alcohol programming taking place on those campuses. For campuses who self-select to be included in annual data collection, factors such as size and type of institution, funding structure (private or public), geographic location, and other institutional factors can also be associated with measures of alcohol consumption⁸ and impact upon interpretations of trends.

Uniquely, the current study examined alcohol consumption patterns and trends at one public university campus in the Northeast from 2002 to 2008. Trends were analyzed based on gender, age, race/ethnicity, residence type, and academic performance. By examining alcohol consumption trends on one campus, many extraneous variables were held constant and meaningful trends could be detected in this context and tested for statistical significance. An understanding of patterns and trends in alcohol consumption among specific demographic groups at one institution can allow for critical analysis of current alcohol programming efforts and inform the development of tailored interventions and allocation of resources where they are most needed.

METHODS

Study Population

All undergraduate students who were enrolled at a specific public university campus were eligible to participate in this study. Data were collected prior to spring break in 2002, 2004, 2006, and 2008. This urban campus offers both bachelors and graduate degree programs and is located in the Northeastern region of the United States. Total enrollment during each of the semesters under study was approximately 12,000 students of which 6,500 were full-time undergraduates. The University provides housing to approximately 2,500 students, representing 38% of the full-time undergraduate population. Minority undergraduate enrollment was consistent at 21% of full-time undergraduate students during the time period of this study, with approximately 12% Black, 6.5% Hispanic, and 2.5% Asian. Approximately 71% of stu-

dents self-identified as White and 8% as other groups including international students. Similar to other public institutions, this university has a larger number of female undergraduates than males, with females representing approximately 65% of the full-time undergraduate population.¹⁰

Sampling Methods

Stratified random sampling was used to select undergraduate courses for participation in this study. Courses were stratified based on 4 levels that signified increasingly advanced course content. The professor for each selected course was contacted via e-mail and asked for permission to collect data during a class session within a specified 2-week period. Additionally, a written invitation with information about the survey purpose and procedures, and a letter of support from the Vice President of Student and University Affairs were sent through campus interoffice mail. Research protocols for each year were approved in advance by the University's Institutional Review Board. The average acceptance rate by professors for the 4 years of study was 63%. In total, 92% of the students in attendance on the date of data collection agreed to participate.

Data Collection Methods

Following recruitment, researchers arranged with professors to visit their classes and administer a pencil and paper survey to willing students. Data collection was completed by trained student and faculty assistants. The purpose of the study was explained to all students and participation was described as anonymous and voluntary, with no penalty for nonparticipation. Students were spread out in the room to provide a confidential setting for survey completion. Surveys were then distributed to willing participants along with cover letters and pencils. The survey took students an average of 25 minutes to complete. Once completed, students were instructed to bring their survey to the front of the room and place it in a large envelope. Students were invited to write their contact information on a raffle ticket and place it in a separate collection envelope. At the conclusion of the entire survey, gift cards to the campus bookstore, valued at \$25 each, were raffled off at a ratio of 1 for every 100 student participants. Gift cards were later mailed to those whose raffle tickets were selected.

Instrumentation

The CORE Alcohol and Drug Survey¹¹ was used for the 4 data collection periods (2002, 2004, 2006, and 2008). This instrument was developed in 1989 and revised in 1994 as a tool for colleges to measure drug and alcohol use on their campuses. The survey includes 39 questions on student characteristics, use of alcohol and drugs, consequences of use, and perceptions of campus norms. The survey has been utilized by more than 1,100 colleges throughout the United States. The Core Alcohol and Drug Survey has demonstrated content related validity, test-retest reliability, and item reliability; however, data were not available on the

TABLE 1. Description of Variables and Measurements

Variable	Survey question	Survey response options	Categories created for data analysis
Previous 30-day frequency	Within the past 30 days, how many days did you have alcohol (beer, wine, liquor)?	0 days 1–2 days 3–5 days 6–9 days 10–19 days 20–29 days All 30 days	0 days 1–5 days 6–9 days 10 or more days
Annual frequency	Within the last year about how often have you used alcohol (beer, wine, liquor)?	Did not use Once/year 6 times/year Once/month Twice/month Once/week 3 times/week 5 times/week Every day	Did not use Twice/month or less Once/week More than once/week
Average weekly volume	Average number of drinks ^a you consume a week?	Write in number	None 1–2 drinks 3–7 drinks 8–13 drinks 14 or more drinks
Previous 2-week heavy drinking frequency	Think back over the last two weeks. How many times have you had five or more drinks ^a at a sitting?	None Once Twice 3 to 5 times 6 to 9 times 10 or more times	None 1–2 times 3 or more times
Gender	Gender?	Male Female	Male Female
Age	Age?	Write in number	Under 21 years of age 21 years of age or over
Race/ethnicity	Ethnic origin?	American Indian/Alaska Native Hispanic Asian/Pacific Islander White (non-Hispanic) Black (non-Hispanic) Other	White Non-White
Residence type	Is your current residence as a student?	On-campus Off-campus	On-campus Off-campus
Academic performance	Approximate cumulative grade point average?	Selected response options ranging from A+ to F	B– grades and above C+ grades and below

^aA drink was defined as a bottle of beer, a glass of wine, a wine cooler, a shot glass of liquor, or a mixed drink.

validity and reliability of the specific questions utilized for this study.¹¹

This study examined 4 measures of alcohol consumption: previous 30-day frequency; annual frequency, average weekly volume, and previous 2-week heavy drinking frequency. Additionally, students were segmented into demo-

graphic groups based on their response to questions about gender, age, race/ethnicity, residence type, and academic performance. The majority of questions used to measure these variables were selected response type questions requiring students to fill in bubbles to indicate their answers. Two variables (age and weekly alcohol consumption volume) required

students to write in a number to indicate their response. Specific questions and response options for each variable are provided in Table 1.

Data Analysis Procedures

Upon completion of data collection for each of the 4 years, survey forms were packaged and mailed to The Core Institute¹² for processing. Forms were scanned and entered into SPSS software¹³ and returned to the researchers for analysis. The researchers prepared data files by collapsing specific response categories to insure an adequate cell size for statistical testing. Specific response categories used for this analysis are provided in Table 1. Because the upper level for each variable was set at a moderate level, outliers were not identified and eliminated prior to data analysis, but instead, collapsed into the highest possible category. For example, the highest category possible for average weekly volume was 14 or more drinks. Students who indicated more than 14 drinks per week were appropriately collapsed into this category. Because data for each variable were ordinal, the Spearman Rank Order test was used to examine trends in alcohol consumption within each demographic group.^{14,15} A positive trend indicated that as year increased, so did the alcohol use among those students. Because multiple tests were performed on the same data, 4 per control variable, a significance level of $p < .01$ was used for each test. This study contained multiple sets of data (4 time periods) and therefore it was beyond the scope of this study to perform statistical tests to examine significant differences in alcohol consumption between variables within each demographic group.

RESULTS

Description of the Sample

The sample recruited for each year of this study ranged from 760 to 1,109 students. The largest sample was recruited in 2002, a year when stratified sampling methods included an effort to over sample freshmen and on-campus students. Freshmen and sophomores were also purposely oversampled in 2008. With these exceptions, the demographic distribution of the sample recruited for each year closely resembles that of the study population of undergraduate students from this university described previously.¹⁰ A description of the sample for each year of data collection is provided in Table 2.

Demographic Trends

This study examined 4 measures of alcohol consumption among undergraduate college students. Analysis of data collected between 2002 and 2008 revealed several significant positive trends, indicating that alcohol consumption, by several different measures, has increased within specific demographic groups. It is noteworthy that none of the groups analyzed in this study demonstrated a significant negative trend, demonstrating that no group decreased their alcohol consumption during this time period. Four different groups showed significant increases in both frequency and volume of alcohol consumption—students who were female, over 21 years of age, living off-campus, or performing well academically. Additionally, 4 other groups of students showed a significant positive trend for 1 measure of alcohol consumption (either frequency or volume): students who were under 21 years of age, White, Non-White, or living on-campus. A

TABLE 2. Description of Samples 2002–2008

	2002 <i>N</i> = 1109 ^a		2004 <i>N</i> = 760 ^a		2006 <i>N</i> = 802 ^a		2008 <i>N</i> = 783 ^a	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender								
Males	338	32.7	239	32.9	261	34.7	247	32.2
Females	697	67.3	487	67.1	492	65.3	521	67.8
Age								
Under 21 years of age	682	61.5	266	35.0	311	38.8	388	49.6
21 years of age or over	427	38.5	494	65.0	491	61.2	395	50.4
Race/ethnicity								
White	744	68.4	532	70.7	572	72.7	565	75.2
Non-White	343	31.6	221	29.3	215	27.3	186	24.8
Residence type								
On-campus	548	56.3	187	27.8	247	34.7	249	36.7
Off-campus	425	43.7	485	72.2	464	65.3	429	63.3
Academic performance								
A/B grades	778	71.8	613	81.8	632	81.5	620	82.1
C grades or below	305	28.2	136	18.2	143	18.5	135	17.9

^aFrequency counts for demographic variables vary slightly due to survey nonresponses.

TABLE 3. Demographic Trends in Alcohol Consumption, 2002–2008

	Previous 30-day frequency		Annual frequency		Average weekly volume		Previous 2-week heavy drinking frequency	
	r_s^a	p	r_s^a	p	r_s^a	p	r_s^a	p
Gender								
Males	.028	.371	.022	.475	.045	.187	.019	.534
Females	.059	.006*	.059	.006*	.084	<.001*	.033	.125
Age								
<21 years	.034	.182	.044	.077	.105	<.001*	.033	.910
≥21 years	.078	.001*	.056	.016	.067	.005*	.087	<.001*
Race/ethnicity								
White	.048	.020	-.010	.622	.079	<.001*	.036	.080
Non-White	.027	.414	.158	<.001*	.069	.034	.014	.663
Residence								
On-campus	.065	.026	.068	.019	.100	.001*	.040	.161
Off-campus	.008	.064	-.052	.028	.060	.009*	.064	.007*
Academic performance								
A/B grades	.073	<.001*	.067	<.001*	.079	<.001*	.059	.002*
C–F grades	.019	.628	.016	.672	.074	.049	.016	.666

^a r_s = Spearman rank order correlation.

* p < .01.

summary of results from the trend analyses for all demographic groups is provided in Table 3.

Gender

Significant increases were demonstrated in 3 measures of alcohol intake among females: previous 30-day frequency ($p = .006$), annual frequency ($p = .006$), and average weekly volume ($p < .001$). Females did not show a significant increase in heavy drinking frequency. There were no significant increases or decreases for any of the 4 measures of alcohol consumption among males, indicating that alcohol consumption among males has remained relatively constant for the past 6 years. In 2002, men had consistently higher rates of alcohol consumption than females, but it is notable how the gap in alcohol consumption frequency and volume has narrowed between men and women during the time period of this study for every measure except heavy drinking frequency. In 2002, 73.4% of men reported drinking during the previous 30 days compared to 69% of women. By 2008, that percentage had increased to 78.3% of men and 78.8% of women.

Legal Age

Because the legal age for purchasing alcohol in the United States is 21 years of age, data were analyzed separately for those 21 years or over (legal age) and those under 21 years of age (under age). Initially in 2002, alcohol consumption measures did not differ substantially between these 2 groups.

Between 2002 and 2008, for students 21 years or over there were significant increases in 3 of 4 measures of alcohol consumption: previous 30-day frequency ($p = .001$) and heavy drinking frequency ($p < .001$), and average weekly volume ($p = .005$). The trend for annual frequency ($p = .016$) among students in this group also approached significance for an increasing trend. Students who were under 21 years of age demonstrated a significant increasing trend in alcohol consumption by 1 measure: average weekly volume ($p < .001$).

Race/Ethnicity

Due to the small number of participants from various minority groups, students were categorized as White or Non-White for the purpose of analysis. Whites reported consistently higher measures of alcohol consumption for each year of study. Whites showed a significant increasing trend for 1 measure: average weekly volume ($p < .001$). Non-Whites demonstrated a significant increasing trend for 1 measure of alcohol consumption: annual frequency ($p < .001$).

Residence Type

Alcohol consumption was analyzed based on whether students lived on-campus or off-campus. On-campus students consistently indicated higher alcohol consumption frequency and volume for each year of study and demonstrated a significant increasing trend for 1 measure of alcohol consumption: average weekly volume ($p = .001$). This group also approached significance for an increasing trend in previous

30-day frequency ($p = .026$) and annual frequency ($p = .019$). Off-campus students, despite reporting lower overall rates of alcohol consumption, showed significant increases in 2 of the 4 measures: average weekly volume ($p = .01$), and heavy drinking frequency ($p = .007$).

Academic Performance

Students were asked to self-report their average grades and alcohol consumption was analyzed separately for those reporting A/B grades and those reporting C grades or below. Alcohol consumption did not differ substantially between the 2 groups, with the exception of heavy drinking frequency where C or below students indicated higher levels. Trend analysis, however, revealed significant increasing trends in alcohol consumption for A/B students by all 4 measures: previous 30-day frequency ($p < .001$), annual frequency ($p < .001$), average weekly volume ($p < .001$), and heavy drinking frequency ($p = .002$). There were no significant trends in consumption among students reporting average grades of C or below.

COMMENT

Strengths and Limitations

This study provides a detailed look at demographic trends in alcohol consumption at one public university in the Northeast and therefore results should not be generalized beyond this campus population. Random selection, high rates of participation and use of a widely accepted instrument for data collection are strengths in this study. The use of multiple measures of alcohol consumption has provided a comprehensive view of trends in drinking behaviors on this particular campus.

This research however is not without limitations. Although the response rate among students who were invited to participate was high, all randomly selected courses were not granted permission to invite students to participate. As a result, it is possible that this sample does not fully represent the larger university population of undergraduate students for each year of study. The Core Alcohol and Drug Survey¹¹ is a widely accepted instrument for measuring alcohol consumption among college students, but this study utilized specific questions that had not been tested separately for reliability and validity. As with any self-report instrument, these data are vulnerable to fabrication or inaccurate participant recall. Notably, researchers took measures to insure participation was voluntary, anonymous, and confidential, which increases confidence in the quality of the data. Finally, data analysis was limited to broad demographic groups due to sample size limitations. A more detailed analysis of subcategories for race/ethnicity would have been desirable. The results of data analysis for the broad demographic group of Non-Whites should be interpreted with caution in this study.

Discussion

Despite an environment of increased alcohol prevention programming, alcohol consumption within specific demo-

graphic groups has continued to increase on this university campus and no groups show a significant decrease. Increasing trends in a single measure of alcohol consumption, either frequency or volume, were found among 4 groups of students: those who were under 21 years of age, White, Non-White, or living on-campus. Increasing trends in measures of both frequency and volume of alcohol consumption were found among 4 other groups of students: those who were female, over 21 years of age or over, living off-campus, or performing well academically. Interestingly, each of the groups demonstrating increases in both frequency and volume of consumption had alcohol consumption patterns that initially tended to be lower or equal to their demographic counterparts. With these increasing trends, it appears that differences between groups based on demographic characteristics may be narrowing in a way that will result in more alcohol consumption and related problems overall within this campus environment.

Clearly, the gender gap in alcohol consumption on this campus has narrowed between 2002 and 2008, with females increasing their previous 30-day alcohol consumption, annual frequency, and average weekly volume to levels that are now comparable to those of males. These data differ from those of other recent studies that have examined female alcohol consumption trends in the United States. Wilsnack et al¹⁶ examined US trends in female drinking patterns between 1981 and 2001 and found that alcohol consumption had not changed significantly among women 21 to 30 years of age. Data from the Office of Applied Studies, Substance Abuse and Mental Health (SAMHSA)¹⁷ indicated that among full-time college students, ages 18 to 20 years of age, 30-day prevalence of alcohol use remained steady between 2002 and 2005. Finally, data from the ACHA-NCHA indicate that 30-day alcohol consumption frequency remained relatively constant among college females between 2004 and 2007.⁷

One explanation for differences in findings may lie in the single-campus design of the current study, which allowed many variables to be held relatively constant over time. The ACHA-NCHA utilizes samples that include different selections of college campuses from year to year dependent on which campuses volunteer to participate and pay fees for instrumentation and data analysis. This sampling method can introduce variability in factors that are known to correlate with alcohol consumption, such as size and type of institution, region of the country, and types of alcohol programming provided to those students; items that were held relatively constant in the present study. Data from SAMHSA¹⁷ and Wilsnack et al¹⁶ examined drinking behavior for slightly different age groups of females. SAMSHA was focused on full-time underage college students, 18 to 20 years old,¹⁷ and Wilsnack et al analyzed data from women 21 to 30 years of age and did not focus specifically on college students.¹⁶

It is important to explore the source of the observed increases in alcohol consumption among females on this particular university campus. Wilsnack et al¹⁸ have suggested that "if gender differences in alcohol use have socio-cultural causes rooted in gender roles, then as women gain access to traditionally male roles and environments, and/or differences

between gender roles diminish, women's and men's drinking behavior would be expected to converge" (p. 253). Similar to other public institutions, this university has experienced a slow but steady increase in female students as a percentage of total enrollment. Currently, females make up 65% of the undergraduate population and 75% of the graduate population on this campus. It is possible that this female-dominated environment has had social implications related to drinking behavior. Qualitative investigation of sociocultural factors and gender roles with this population of female students may provide insight that could lead to a greater understanding of underlying causes of increasing trends observed for this population.

Interestingly, heavy drinking frequency did not increase among females during the period of this study and remains consistently lower than that of males. This pattern is consistent with findings from Wechsler et al⁸ in their study of trends in college binge drinking among students from 119 schools between 1993 and 2001. Interestingly, this pattern has been shown to be consistent across a variety of cultural groups. Wilsnack et al¹⁸ in their study of cross cultural gender differences in alcohol consumption found that men consistently exceed women in alcohol consumption frequency, volume, and rates of heavy drinking.

Increasing trends observed in both frequency and volume of alcohol consumption among off-campus students and those 21 years of age or older merits further exploration. The rise in alcohol consumption for those over 21 years or over, for whom alcohol consumption is legal and largely unregulated, may reflect broader issues related to the promotion of alcohol and a shift in social norms toward greater participation in activities where alcohol is served. In their study of the relationship between marketing practices and alcohol consumption among college students, Kuo et al¹⁹ confirmed that alcohol specials and promotions are widespread in areas around college campuses and low prices and frequent promotions were associated with higher rates of heavy drinking by students. The researchers also reported a strong relationship between the number of alcohol establishments in a campus community and the number of drinks consumed by students.

For the current study, findings of increasing trends in both frequency and volume of alcohol consumption by students who are of legal drinking age and living off campus is worthy of attention and may relate to alcohol pricing and marketing practices in the immediate campus environment. To date, community partnerships for alcohol programming on this campus have been focused on reducing underage drinking through more aggressive controls on age verification and penalties for sales to underage students. An expansion of these community partnerships with owners of package stores, bars, and other drinking establishments to analyze pricing and promotion strategies, find areas of common interest, and implement appropriate changes, may be an effective way to influence drinking behavior in this population of students.

Unlike their counterparts, on-campus students and underage students did not demonstrate significant increases in fre-

quency of alcohol consumption during the time of this study, but did show significant increases in average weekly volume. All measures of alcohol consumption frequency remained on a plateau between 2002 and 2008, neither increasing nor decreasing. This plateau in frequency paired with an increase in volume may be informative for those administering alcohol-related programming on this campus, because during the time of this study, the majority of programming efforts were focused specifically on this population. Although measures of frequency for previous 2-week heavy drinking did not increase for these groups, it is still possible that limiting access to alcohol on this campus has resulted in higher consumption volumes per drinking episode; volumes that fall below the threshold for "heavy drinking." Specific campus efforts implemented during the years of this study included a dedicated drug and alcohol center, revised alcohol policies for residential students, a drug and alcohol task force, various alcohol educational programs for first-year students, and an increase in alcohol-free social programming on campus during hours when students traditionally drink alcohol (eg, late nights on Thursdays and Fridays). Unfortunately, due to a lack of resources, these programs were not evaluated in specific ways that allow for direct associations to be drawn between intervention exposure and alcohol behaviors within specific demographic groups. The acquisition of resources for rigorous evaluation of outcomes related to specific programming initiatives should be a priority for this campus in the future.

College alcohol literature consistently shows that White students, when compared to other racial/ethnic groups, are more likely to consume alcohol and do so excessively.⁷⁻⁹ This study produced results consistent with those findings. It is important to note that the positive trend observed in 1 measure of alcohol consumption for Non-Whites (annual frequency) and Whites (average weekly volume) in this study has limited application because specific racial and ethnic groups were not analyzed separately due to small sample sizes. For example, Wechsler et al,⁸ in a sample of 119 schools, found significant decreasing trends in binge drinking among Hispanic and Native American students, but not among those from other racial/ethnic groups. Non-Whites are a diverse group for whom effective programming cannot be generically designed. Additional research with larger sample sizes for each racial/ethnic group is needed in order to reach meaningful conclusions that can inform program development on this campus based on this demographic characteristic.

An interesting finding in this study that requires further study is the increasing trend in all 4 measures of alcohol consumption among students reporting higher academic performance (A/B grade average). This result may reflect an actual change in the types of students who are drinking frequently and at high volumes, or, it may be an artifact related to grade inflation or changes in types of students admitted or allowed to stay enrolled on this college campus. Indeed, data show that grade inflation has occurred in both private and public college institutions during the time of this study with average GPAs increasing steadily from 2.85 in

1991–1992 to 3.01 in 2007–2008.²⁰ For this campus, approximately 80% of students reported their grades as A/B average and only 20% indicated they averaged grades of C or lower. Notably, a grade point average of 2.0 is required after the sophomore year in order to remain enrolled as a matriculated student on this campus, hence limiting the percentage of legal age students who would report in this lower category of academic performance. It is also worth noting that average SAT scores (combined verbal and math) for admission to this campus increased steadily from 938 to 955 during the 6-year period of this study. Exploring whether higher-performing students are changing their alcohol behaviors or whether lower-performing students are being reclassified into higher-performing student categories is an important issue to investigate prior to acting upon these results with targeted programming efforts.

As an overall recommendation, trends in this study should be examined in greater detail with research methods that allow for rich, contextual exploration. Qualitative studies utilizing focus groups and interviews can provide detailed information and uncover specific facilitators associated with increasing trends in alcohol consumption within specific demographic groups.²¹ Exploration of sociocultural factors and gender roles and their relationship to alcohol use would be especially informative in light of the increasing trends observed in alcohol consumption among females on this campus. A comprehensive view of issues related to alcohol consumption among subgroups of students can allow for the development of tailored, comprehensive, and coordinated alcohol prevention programming on this and other university campuses.

NOTE

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REFERENCES

1. Hingson RW, Heeren T, Zokocs RC, Kopstein A, Wechsler H. Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18–24. *J Stud Alcohol*. 2002;63:136–144.
2. Weitzman ER, Nelson TF. College student binge drinking and the “prevention paradox”: implications for prevention and harm reduction. *J Drug Educ*. 2004; 34:247–266.

3. Perkins HW. Surveying the damage: a review of research on consequences of alcohol misuse in college populations. *J Stud Alcohol*. 2002;S14:91–100.
4. American College Health Association. *American College Health Association—National College Health Assessment: Reference Group Data Report Fall 2007*. Baltimore, MD: American College Health Association; 2008.
5. Core Institute. *2006 National Reference Group: Cross-Tabulation*. Carbondale, IL: Core Institute; 2008.
6. Wechsler H, Seibring M, I-Chao L, Ahl M. Colleges respond to student binge drinking: reducing student demand or limiting access. *J Am Coll Health*. 2004; 52:159–168.
7. American College Health Association. *American College Health Association—National College Health Assessment: Reference Group Data Reports*. Available at: http://www.acha-ncha.org/pubs_rpts.html. Accessed June 5, 2008.
8. Wechsler H, Lee JE, Kuo M, Seibring M, Nelson TF, Lee H. Trends in college binge drinking during a period of increased prevention efforts: findings from 4 Harvard School of Public Health college alcohol study surveys: 1993–2001. *J Am Coll Health*. 2002; 50:203–217.
9. O’Malley PM, Johnson LD. Epidemiology of alcohol and other drug use among American college students. *J Stud Alcohol*. 2002; S14:23–39.
10. Facts and Figures. Available at: <http://www.southernct.edu/publicaffairs/forthemedia/factsandfigures/>. Accessed March 10, 2009.
11. Presley CA, Vineyard GM. *Core Alcohol and Drug Survey User’s Manual*. 7th ed. Carbondale, IL, Core Institute; 2004
12. Core Institute. *Services*. Available at: <http://www.siu.edu/~coreinst/>. Accessed June 5, 2008.
13. SPSS Inc. *SPSS Base 13.0 for Windows User’s Guide*. Chicago IL: SPSS; 2004.
14. Daniel WW. *Applied Nonparametric Statistics*. 2nd ed. Boston: PWS-Kent Publishing Company; 1990.
15. Daniels HE. Rank correlation and population models. *J R Stat Soc*. 1950; B12: 171–191.
16. Wilsnack RW, Kristjanson AF, Wilsnack SC, Crosby RD. Are US women drinking less (or more)? Historical and aging trends, 1981–2001. *J Stud Alcohol*. 2006; 67:341–348.
17. Office of Applied Studies, Substance Abuse and Mental Health Services Administration (SAMHSA). Underage alcohol use among full-time college students. *NSDUH Rep*. 2006;31:1–4. Available at: <http://www.oas.samhsa.gov>. Accessed March 10, 2009.
18. Wilsnack RW, Vogeltanz, ND, Wilsnack SC, Harris R. Gender differences in alcohol consumption and adverse drinking consequences: cross-cultural patterns. *Addiction*. 2000; 95:251–265.
19. Kuo M., Wechsler H., Greenberg MA, Lee H. The marketing of alcohol to college students: the role of low prices and special promotions. *Am J Prev Med*. 2003; 25: 204–211.
20. Rojstaczer S, Healy C. Grading at American Colleges and Universities [manuscript under review]. Available at: <http://www.gradeinflation.com>. Accessed March 10, 2009.
21. Denzin NK, Lincoln YS, eds. *Handbook of Qualitative Research*. 2nd ed. Thousand Oaks, CA: Sage; 2000.

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