Drinking in Undergraduate and Graduate Students

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Abstract ~ There has been considerable research on the drinking rates of undergraduate college students. This research has consistently found high drinking rates among undergraduate samples. However, little of this research has been extended to also include samples of graduate students. It is, therefore, unknown whether the high drinking rates that characterize the undergraduate population are also found in the graduate population. The present paper addresses this gap in the literature, by reporting on a comparison of drinking rates between both an undergraduate and a graduate sample at New School University. The study measured both samples on five indices of drinking rates and frequency of negative consequences resulting from alcohol use. It was hypothesized that the undergraduate sample would report higher drinking rates, as well as greater frequency of negative

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consequences. However, where significant results were attained, it was the graduate sample that reported higher drinking rates. The implications of this finding are speculated upon. Secondarily, the current study attempted to replicate research demonstrating a relationship between gender and drinking rates, as well as grade point average (GPA) and drinking rates. In both cases, little or no relationship was found in the current sample between these variables and drinking rates. The implications of this finding are speculated upon, as well.

Introduction

There have, in the past 10 years, been a series of studies on alcohol use among college students. These studies typically examine both prevalence rates of alcohol use and the extent of negative consequences stemming from alcohol use. Researchers have found highly consistent drinking rates. O'Malley & Johnston (2002) review five nationwide surveys on alcohol use among college students. They review, the College Alcohol Study (CAS), conducted by the Harvard School of Public Health (Wechsler et al., 1994; Wechsler & Dowdall, 1998; Wechsler, Kelly & Weitzman, 2000; Wechsler et al., 2002); the Core Institute Survey (CORE), conducted by Southern Illinois University (Presley et al., 1996); the Monitoring the Future Survey (MTF), conducted by the University of Michigan (Johnston, O'Malley & Bachman., 2000); the National College Health Risk Behavior Survey (NCHRBS), conducted by the Centers for Disease Control and Prevention (Centers for Disease Control and Prevention, 1997); and the National Household Survey on Drug Abuse (NHSDA), conducted by the Substance Abuse and Mental Health Services Administration (Gfoerer, Greenblatt & Wright, 1997).

O'Malley & Johnston found that, across each of these studies, about 70% of college students reported having had at least one

drink in the past 30 days. In four of the five surveys, about 40% of college students reported at least one instance of binge drinking, with "binge drinking" defined as having five drinks in a row (or, in some cases, the cut-off was four drinks for women), and with time intervals across studies ranging from the prior two weeks to the prior 30 days. The only exception to this figure was the NHSDA, which employed a particularly stringent measure of binge drinking (i.e., five or more drinks per occasion on each of five or more days in the prior 30 days). Even with this measure, the NHSDA still reports a 12% prevalence rate of binge drinking.

The bulk of the literature has been focused on undergraduates. Moreover, there has been little explicit comparison between undergraduate and graduate samples. This study will address this gap in the literature, by extending the research on alcohol frequency and quantity, and negative consequences, to a graduate sample at the New School. It is hypothesized that a graduate student sample will demonstrate both a smaller prevalence rate and fewer negative drinking-related consequences than an undergraduate sample. This hypothesis is consistent with the common perception of undergraduate life as being a period of notably heavy drinking (Schulenberg, O'Malley & Bachman., 1996; Schulenberg & Maggs, 2002). It is also consistent with the little research that has compared graduate and undergraduate drinking rates (Gassman, Demone & Wechsler, 2002).

Beyond the comparison between the graduate and undergraduate sample, established relationships between gender and alcohol use, as well as grade point average (GPA) and alcohol use, will also be tested. Prior research (predominantly conducted on undergraduates, though with slight graduate influence) has established that, among college students, males drink more and experience more negative alcohol-related consequences than females (see the nationwide surveys already cited), and that there is a negative correlation between alcohol use and GPA (Paschall &

Freisthler, 2003; Perkins, 2002b; Wolaver, 2002). It will be tested whether both findings can be extended to the current sample. These analyses, though, should be regarded as of secondary importance in this study, with our primary point of interest being the graduate/undergraduate comparison.

Lastly, the parameters of this study should be noted. This paper will compare drinking frequency and quantity, and the negative effects stemming from drinking, in both a graduate and an undergraduate sample. It will also provide a limited demographic breakdown, in the form of a male-female comparison of the measures employed, and it will assess the relationship between drinking and GPA in the overall sample. However, the research reported here did not contrast the samples on subtler elements of drinking habits, such as drinking motivations and specific locations in which individuals drink. The literature on alcohol use among undergraduates assesses these variables, with common motivations to drink including drinking as a coping mechanism (McCormack, 1996; Park & Levenson, 2002), and drinking in order to conform to actual or perceived social norms (Page, Scanlan & Gilbert, 1999; Perkins, 2002a), and common locations including fraternity and sorority settings and at bars (Harford, Wechsler & Seibring, 2002).

This research, then, is, by design, only a preliminary step in evaluating drinking habits across a graduate and undergraduate population. It assesses the broad strokes of drinking behavior, as a basis from which the details of drinking habits can also be ascertained. Given the important social role alcohol plays, particularly among young adults, an understanding of the manner in which drinking habits evolve through the trajectory of young adulthood (i.e., from undergraduate through graduate study) has the potential to shed light on the individual's developing relationship towards society.

Methods

<u>Participants</u>
Participants consisted of 14 graduate students (9 women, 5 men) and 12 undergraduate students (9 women, 3 men). A total of 21 undergraduates were approached, of which 12 (57.4%) agreed to participate.

Both samples were gender-skewed, consisting of more women than men. While it is unlikely that such an extreme ratio would be representative of the nationwide gender ratio of all graduate-level students, the current sample does at least provide an accurate male/female cross-section of graduate-level psychology students. The study's small sample size precludes any meaningful breakdown along racial or ethnic lines.

<u>The Measure</u>
The measure used was the short form of the Harvard Alcohol Survey (HAS), the long version of which is the measure employed in the CAS. The HAS consists of four subsections, 1) demographic information, 2) drinking prevalence and quantity, 3) frequency of negative consequences stemming from drinking, and 4) perceptions of campus alcohol policies. As the final subsection does not adapt well to the New School environment, particularly with regard to the graduate sample, it will not be reported on here.

The HAS measures three categories of drinking prevalence, 1) annual prevalence (whether a participant has had a drink in the past year), 2) monthly prevalence (whether a participant has had a drink in the past month, and 3) binge drinking. The binge-drinking measure is gender-specific. For males, having five drinks in a row is considered binge drinking. For females, the binge-drinking standard is only four drinks. The distinction is employed to take into account the lower average body mass of

the female population (Wechsler, Dowdall, Davenport & Rimm, 1995). In both cases, the HAS measures the number of binge drinking episodes in the past 2 weeks.

Participants who had consumed alcohol in the past 30 days were asked to report on the number of occasions they had a drink in the past 30 days, as well as the number of drinks they typically had on each occasion. They were also asked to report the number of occasions they had gotten drunk during that period. Students who drank alcohol in the past year were asked a series of questions about the health and behavioral consequences of their own drinking, ranging from mild consequences (getting a hangover) to more severe examples (experiencing an unwanted sexual encounter).

The questionnaire defines one drink as equivalent amounts of alcohol: a 12-oz. bottle or can of beer, a 4-oz. glass of wine, a 12-oz. bottle or can of wine cooler, or a shot of liquor (1.25 oz). Participants in the study were not initially directed as to what constituted a drink. If a participant asked, he or she was directed along the guidelines described above.

Results

Data Analysis
In the graduate/undergraduate analysis, comparisons of drinking frequency and negative outcomes were assessed using chi-square analysis. Differences in monthly drinking prevalence, binge drinking, drunkenness, and negative consequences were indicated as raw totals, and tests of the significance of the totals were carried out using chi-square analysis. In addition to the graduate/undergraduate analysis, the same analyses were performed along gender lines and according to GPA. In the graduate/undergraduate and gender comparisons, analyses of the number of drinks per drinking episode were assessed using an independent

groups t test. The number of drinks per episode was expressed as a mean score, and the difference between the means was analyzed by use of an independent groups t test. The same process was followed in the GPA comparison, except that the greater number of cells required that a between subjects analysis of variance (ANOVA) be employed. In the gender and GPA comparisons, the graduate and undergraduate groups were not treated discretely as individual samples, but combined into one overall sample. Participants reporting abstention were instructed to disregard the drinks per episode measure, and thus the measure reflects only those participants who reported at least one drinking episode over the prior month.

Outcome

Three separate analyses were performed, according to, 1) educational level, 2) gender, and, 3) GPA. Each comparison was broken-down along five lines, 1) monthly drinking prevalence, 2) binge drinking prevalence, 3) number of drinks per drinking episode, 4) occasions of drunkenness, and 5) frequency of negative consequences. In the graduate/undergraduate analysis, there was an overall tendency towards more frequent and heavier drinking on the part of the graduate sample. In the case of monthly drinking prevalence, the HAS asks participants to place themselves in one of 5 categories according to the number of times they drank (one drink or more) over the course of the prior month. Taken thusly as a whole, the measure reveals a tendency towards more drinking episodes on the part of the graduate students. It attains an $x2$ of 10.67, a figure that would ordinarily reach statistical significance, at $p < .05$. However, the high number of cells, combined with the small number of participants, results in too few participants per cell for statistical significance to be inferred.

By adjusting the measure in order to use fewer cells, the measure, although considerably blunter, does attain statistical significance.

If, for instance, we divide the measure into participants reporting the highest number of drinking episodes per month (10-19 episodes), versus those reporting less than that, we attain statistical significance. Six out of 14 graduate students (42.8%) reported the highest number of drinking episodes per month, while 0/12 undergraduates (0%) placed themselves in that category, ($x2 =$ 6.69, p < .05).

Although the graduate sample reported more frequent binge drinking than the undergraduate sample, as with the monthly prevalence measure, the breadth of the measure precludes statistical significance in that we end up with too few participants per cell. Again, however, we can refine the measure in order to decrease the cell size, and in this way we can attain statistical significance. Taken as a strictly dichotomous measure, according to whether participants have had at least one episode of binge drinking in the prior 2 weeks, or whether they have not, the variation is concentrated and thus the measure achieves statistical significance. Seven out of 14 graduate students reported at least one episode of binge drinking in the previous two weeks (50.0%), compared to 1/12 undergraduates (8.3%) ($x2 = 8.21$, p < .05). Please see Tables 1 and 2 for the results of both the overall binge drinking measure and the dichotomous version of the measure.

Neither the comparisons of number of drinks per episode, occasions of drunkenness, nor frequency of negative consequences achieved statistical significance. The undergraduate sample reported a negligibly higher average number of drinks per episode. The graduate sample reported more instances of drunkenness, but the difference did not reach statistical significance. Only the mildest negative consequence, getting a hangover, proved frequent enough to permit statistical analysis. On this measure, too, the graduate sample reported more hangovers, but the difference was not statistically significant.

	Observed Frequenccy	Expected Frequency	x^2
Graduate/ 3-5 Episodes	3	1.62	1.17
Undergraduate/ 3-5 Episodes	0	1.38	1.38
Graduate/ 1-2 Episodes	4	2.69	.64
Undergraduate/ 1-2 Episodes	1	2.31	.74
Graduate/ 0 Episodes	7	9.69	.75
Undergraduate/ 0 Episodes	11	8.31	.87

Table 1. Binge Drinking Episodes in Prior 2 Weeks -
Graduate/Undergraduate

	Observed Frequenccy	Expected Frequency	x^2
Graduate/ 1+ Episodes	7	3.77	2.77
Undergraduate/ 1+ Episodes	0	3.23	3.23
Graduate/ 0 Episodes	7	10.23	1.02
Undergraduate/ 0 Episodes	12	8.77	1.19

Table 2. Dichotomous Binge Drinking Episodes in Prior 2 Weeks -
Graduate/Undergraduate ($p < .05$)

In the male/female comparison, the differences between the samples only reached statistical significance on the measure of number of drinks per drinking episode. The male sample drank more per drinking episode, averaging 3.3 drinks, compared to 1.9 drinks for the female sample ($t = 2.26$, $df = 19$, $p < .05$).

On the other measures, the male/female comparison could best be described as the male sample displaying a greater prevalence of

both extremes of drinking behavior, abstention as well as excessive drinking. A higher proportion of males than females reported not drinking at all over the prior month, 2/8 compared to 3/18 (25.0%-16.7%). At the same time, a greater proportion of males reported high numbers of drinking episodes, with 3/8 males (37.5%) reporting 10-19 drinking episodes over the prior month, compared to 3/18 females (16.7%). Likewise, a greater ratio of males than females reported not getting a hangover over the course of the current semester, 5/8 compared to 8/18 (62.5%-44.4%). Still, a higher proportion of males reported multiple hangovers (2 or more) over that same period, 2/8 compared to 2/18 (25.0%-11.1%). As noted, however, these differences did not reach statistical significance.

The GPA comparison did not yield statistically significant results. On 4 of the 5 measures, no discernible pattern could be identified in the data. Drinking prevalence, and frequency of negative consequences, were scattered randomly across GPA categories. The one measure on which a pattern could be discerned was the number of drinks per drinking episode. On this measure, there was a negative correlation between drinks per episode and GPA: participants reporting a B average reported more drinks more episode than those with a B+ average, those reporting a B+ average reported more drinks per episode than those with an A-, and so on. This correlation, however, did not reach significance. In addition to being insignificant, the correlation is also misleading. Participants reporting a B average reported the highest number of drinks per episode, at 4.0. However, a majority of participants reporting a B average reported abstention over the prior month, and thus were exempt from the drinks-per-episode measure; the 4.0 figure, then, reflects only a minority of participants with a B average.

Discussion

By and large, the results attained from this study were, alternately, non-significant and counter to the initial hypothesis. Of the 15 separate analyses run, 12 did not achieve statistically significant results. Of the three remaining analyses, two of them, the graduate/undergraduate comparison on monthly drinking prevalence and the same comparison on binge drinking prevalence, achieved significant results opposite to the hypothesized result. Whereas it was hypothesized that the undergraduate sample would demonstrate higher drinking rates than the graduate sample, on those two measures, once they were adjusted to accommodate the study's small sample size, the graduate sample in fact reported significantly higher drinking rates. The only analysis that achieved results that were both statistically significant and consistent with the initial hypothesis was on the secondary comparison of male/female drinking rates. In this comparison, one of the five measures employed, mean number of drinks per episode, achieved statistically significant results, with the male sample averaging (as hypothesized) more drinks per episode than the female sample. The GPA comparison did not achieve statistically significant results on the any of the five indices of drinking rates and consequences.

In the end, we have two separate groups of results for which we need account. The first group concerns the graduate/undergraduate comparison, the results of which, in three of the analyses, failed to support our hypothesis, and in the other two analyses lent support to an opposing and contradictory hypothesis. The second group concerns the gender and GPA comparisons, which mostly failed to replicate the previously demonstrated relationship between these variables and drinking rates.

The hypothesis of greater drinking rates among undergraduates was derived, primarily, from the common perception that the

undergraduate period is one of notably heavy drinking. This perception, as best the author has been able to ascertain, has, empirically, been only minimally tested. Nevertheless, the empirical research on drinking rates among undergraduates often appears to proceed, either implicitly or explicitly, from the belief that undergraduate college students, on average, drink more heavily than the general population.

This perception does have intuitive and commonsensical plausibility to it. Given the youth of college undergraduates, their new-found freedom from parental constraints in many cases, and their relatively flexible schedules, these conditions would logically both promote and allow for elevated drinking rates. Still, to the best of the author's knowledge, the perception of unusually high drinking rates among college undergraduates remains just that, a perception, rather than an established and objective fact. As such it is susceptible to empirical falsification. The national surveys cited in the introduction have consistently established drinking rates among the undergraduate population. It may be the case, though, that we underestimate drinking rates among the general population; it may be the case that general drinking rates are in fact more in line with undergraduate drinking rates than we would think.

Or it may be the case that undergraduate drinking rates are indeed higher than that of the general population, but that the graduate student population joins the undergraduate population in demonstrating larger-than-average drinking rates. Graduate students, after all, are usually still relatively young, and in many cases they, too, have relatively flexible schedules. These same conditions that are seen as contributing to high drinking rates for undergraduates may do the same for graduate students. Furthermore, in addition to these conditions being met in the graduate population, the graduate population has the additional convenience of being invariably of legal age to purchase alcohol.

This convenience does not extend to many undergraduates. This may exacerbate the already favorable conditions for drinking rates among the graduate population, resulting in a cohort that in fact drinks more heavily than the undergraduate population, as was demonstrated on two measures in the current study.

In light of these considerations, we can posit three alternative hypotheses to our initial hypothesis of higher drinking rates among undergraduates: first, undergraduate drinking rates are similar to general population drinking rates; second, undergraduate drinking rates are higher than general population drinking rates, but graduate drinking rates are elevated as well and are similar to undergraduate drinking rates, and; third, graduate drinking rates are higher than undergraduate drinking rates. The findings reported here vacillate between supporting the second hypothesis (on the measures in which the two samples reported similar drinking rates) and the third hypothesis (on the measures in which the graduate sample reported higher drinking rates). The first hypothesis is not directly implicated in this study, but is an extension of our failure to confirm higher drinking rates among the undergraduate population, compared to the graduate population.

In light of the research at hand, and the considerations described above, all three of these hypotheses are wholly possible. Further research is needed, between undergraduate and general samples, as well as undergraduate and graduate samples, to determine the veracity of all three.

Turning to reasons to question our research, one general consideration is that all empirical research is subject to the vagaries of chance and random fluctuation. Although the study reported upon here does cast some doubt on our initial hypothesis, the small sample size prevents us from drawing any overarching conclusions from this. As much as the hypothesis may have been

flawed, it may also be that the hypothesis was sound, but that, in any sample of 26, the results are unpredictable enough that they will not reliably substantiate even a sound hypothesis.

Beyond this general consideration, there are more specific reasons to question whether the undergraduate sample, in particular, represented an accurate cross-section of the New School undergraduate population in terms of drinking rates. Among undergraduates, the two groups that more often refused participation were males and individuals who gave indication of having been drinking the night before. As we might expect both groups to demonstrate elevated drinking rates (though this study did not, as prior research had, find elevated drinking rates among males), this might have served to understate drinking rates in the undergraduate sample. This may have contributed to our inability to find support for our hypothesis of higher drinking rates among the undergraduate population, compared to the graduate population.

With regard to the gender and GPA comparisons, it should be noted that the relationships between gender and drinking rates, and GPA and drinking rates, are well-founded in research conducted on an exponentially larger scale than this study. We cannot, then, claim to have disconfirmed those relationships. What we can do is point out distinctions between the sample employed here and the samples from which these relationships have been discerned. From there, we can speculate as to potential variables mediating the relationship between gender and GPA on the one hand, and drinking rates on the other. In doing so, however, we need keep in mind that, here as well, failure to replicate existing research may have owed as much to the unpredictable nature of a small sample size as anything else.

It would be misleading to describe the gender comparison in this study as having yielded highly similar drinking rates across both

the male and female samples. Even in a study this small, the male sample reported a statistically significant higher drinking rate on one the five measures. On the measures that did not yield statistically significant differences, there were often still evident patterns to be found in the comparison between the two samples.

However, in that the gender comparison mostly did not yield statistically significant results in this research, while the same comparison has consistently yielded such results in prior research, we can speculate as to why the gender relationship did not surface as strongly here. It was noted in the introduction that the research demonstrating a relationship between gender and drinking rates has predominantly been conducted on undergraduate samples. It may be that the relationship is specific to the undergraduate population. If that is true, then the combined undergraduate and graduate sample employed here might have served to dilute the relationship; the relationship may have held true for the undergraduate sample, but the addition of the graduate sample, potentially more balanced in its drinking rates, may have negated that relationship. Further research, is needed to determine if the relationship between gender and drinking rates is indeed specific to undergraduates.

The same point pertains to the GPA comparison: the relationship between GPA and drinking rates has also been determined almost exclusively on undergraduate samples. Here, too, the failure to replicate that relationship might have been a function of utilizing a mixed sample of undergraduates and graduate students. Here, too, a larger sample size would have permitted a separate analysis for the graduate and undergraduate samples. Further research is needed to ascertain whether the relationship between GPA and drinking rates is found only in the undergraduate population.

The other distinction between the sample employed here and prior samples on which the GPA/drinking rate relationship has

been found is that prior studies, conducted on a much larger scale, have had considerable numbers of participants reporting GPA's across the range, from A to F. In this study, no participants reported a GPA below a B, with the bulk of participants reporting either a B+ or A-. It may be that the relationship between GPA and drinking rates only holds, or holds more strongly, when there is a less subtle difference in GPA. It may be that students reporting D's and F's have consistently higher drinking rates than those reporting A's and B's, but that those reporting A's and B's do not differ appreciably in their drinking rates. In examining the literature on GPA and drinking rates, a relationship along those lines does appear to hold. This is another instance in which a more explicit comparison could be useful.

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