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Negative Alcohol-Related Consequences Experienced by Young Adults in the Past 12 Months: Differences by College Attendance, Living Situation, Binge Drinking, and Sex

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Abstract

Purpose.—This study estimated the prevalence of negative consequences associated with alcohol use in a national sample of young adults one or two years after graduating from high school, focusing on differences by college attendance, living situation, binge drinking, and sex.

Methods.—A subsample (N=1,068) of U.S. nationally representative Monitoring the Future study 12th grade students from 2006–2016 cohorts was followed-up at modal age 19 or 20 (in 2008–2017) and asked about negative consequences related to their own alcohol use during the past 12 months. Differences in prevalence were estimated and multivariable models examined associations with college attendance, living situation, binge drinking, and sex.

Results.—Half of surveyed U.S. 19/20 year-old alcohol users (a third of non-binge drinkers and almost three-quarters of binge drinkers) experienced negative consequences in the past year. The likelihood of experiencing several consequence types was significantly associated with college attendance prior to controlling for living situation. In multivariable models controlling for living situation, unsafe driving due to drinking remained more likely for students attending 2-year

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colleges or vocational/technical schools than for 4-year college students or non-attenders. In general, negative consequence risk was elevated among young adults not living with parents (vs. those living with parents) and women (vs. men).

Conclusion.—Negative consequences from alcohol use are prevalent among young adults and differ by college attendance, living situation, binge drinking, and sex. Students at 2-year/vocational/technical schools are at particular risk for unsafe driving, warranting specific research attention and targeted intervention.

Keywords

alcohol; binge drinking; consequences; college; living situation; young adult

1. Introduction

Alcohol use is prevalent in young adulthood. In 2018, about two-thirds of U.S. young adults used alcohol in the past month and roughly a third reported binge drinking.^{1,2} The first few years out of high school constitute a critical developmental period with pervasive role and experience shifts, and are a high-risk period for initiating or escalating alcohol use.^{3–6} Examining the negative consequences of alcohol use during this transition period (just prior to the legal age of 21 for alcohol use in the U.S.) provides information about the scope of the public health burden of alcohol use, which can be used to identify the resources needed to combat prevalent problems.^{7–8} While most alcohol-using young adults do not have alcohol use disorders,¹ many report adverse consequences including negative effects on physical and mental health (e.g., serious injuries, depression, anxiety^{9–11}) and impaired driving.^{12–13}

Most studies on young adult self-reported negative alcohol use consequences involve 4-year college student populations.^{14–16} Less is known about such consequences outside of 4-year college environments; the few available studies have returned mixed results regarding differences in alcohol use consequences based on detailed definitions of college attendance. Lee et al.¹⁷ found no significant differences in mean alcohol-related consequences between young adults not in school, 2-year college or vocational/technical (vo-tech) school students, and 4-year students. Blowers¹⁸ found similar prevalence levels for several individual consequences by college attendance, but the consequence of driving under the influence of alcohol or other drugs was significantly more likely for community college than 4-year college students. Velazquez et al.¹⁹ found mean alcohol-related consequences were higher among men aged 18–25 attending 4-year colleges versus 2-year colleges, but findings did not replicate among women. These studies provide important information, but there is a need for additional research that can include examination of other potential explanatory factors. A range of characteristics may differentiate the likelihood of experiencing alcohol use consequences between 4-year college students, 2-year/vo-tech students, and non-students, including heavy alcohol use, age, working status, relationship status, number of children, and living situation (including commuting and opportunities to live on campus).^{19,20} Of these characteristics, heavy alcohol use and living situation may be particularly likely to be associated with reporting negative consequences from alcohol use.

The likelihood of reporting negative alcohol consequences is higher among those reporting heavy alcohol use.²¹⁻²³ Attending college at a 4-year institution (versus not) has been associated with heavier alcohol use prevalence^{2,24} and faster increases in alcohol use.²⁵ Research using more detailed college attendance definitions (i.e., 4-year institutions, 2-year colleges, and vo-tech schools) has found conflicting results regarding heavy alcohol consumption differences.^{17,18,20} Some research has found higher rates of binge drinking among 4-year college students compared with 2-year college students;^{18,20} other studies find no differences in such drinking between those attending 4-year colleges, 2-year colleges, or those not in school.¹⁷

Living situation (a key developmental context of early young adulthood^{26,27}) includes factors such as living with parents, living on college campuses (in a Greek system [fraternity/sorority], a dorm, or other on-campus facility), or living on one's own not on campus. Young adults who live away from home (i.e., not with parents) have higher alcohol use quantity and frequency.^{6,21,24,26,28,29} Living in dorms is associated with a particularly high likelihood of heavier alcohol use³⁰ as well as alcohol use consequences.²⁴ On-campus residence has been associated with higher alcohol-dependence rates,^{24,31} although evidence indicates rates of alcohol abuse may be highest for those living independently off campus.³¹ The likelihood of various types of living situations is significantly associated with type of educational institution; living with parents is more likely for students attending two-year than 4-year colleges, while living on campus is more likely for 4-year college students.¹⁹

Living situation may be associated with alcohol-related consequences via varying levels of parental monitoring, peer influence, and environmental exposure to factors such as alcohol outlet density. Parental monitoring, which may be associated with living with parents, is negatively associated with increased alcohol use initiation and later alcohol misuse during the late teens and early 20s.³² On the other hand, living on campus, in particular, increases exposure to peers and opportunities for socializing, including fraternities/sororities that are associated with higher alcohol use, high-risk drinking, and more frequent negative consequences.^{20,33,34} Living on or near college campuses also is associated with higher alcohol outlet density and exposure to other pro-alcohol factors such as public drunkenness.³⁵ Exposure to social, residential, and market promotion of alcohol use has been linked to college student binge drinking.^{36,37} At least one study indicates that living situation may act as a mediator of associations between college attendance and alcohol-related outcomes. Velazquez et al.¹⁹ found significant differences between young adult 2- and 4-year college students in past-year alcohol use prevalence among women and men, and in binge drinking prevalence for men, that were explained by differences in living situation.

In addition to the possibilities of sex interactions with living status and alcohol use consequences noted above, direct associations between sex and alcohol use are well known. Historically, young adult men have reported consistently higher alcohol use than women.^{2,38,39} Some research finds men consistently report more alcohol use consequences than women;^{15,40} other studies find little evidence for sex differences in total consequences,⁴¹ while still other research indicates consequence type may vary by sex.^{15,41}

The current study adds to the existing literature on college attendance differences in negative alcohol use consequences by using data from national samples of age 19/20 drinkers to examine: 1) prevalence estimates of specific negative alcohol use consequences overall and by college attendance, living situation, binge drinking, and sex, with the hypotheses that consequence prevalence would be lowest among those not in college, those living with parents, non-binge drinkers, and women; 2) if associations between college attendance and consequences remain significant after controlling for the effects of living situation, binge drinking, and sex in multivariable models; and 3) possible interactions of college attendance with living situation, binge drinking, and sex in regards to consequence associations.

2. Methods

2.1. Study sample and survey administration

Monitoring the Future (MTF)² is a U.S. national cohort-sequential study based on annual surveys of nationally representative samples of approximately 15,000 12th grade students (modal age 18) from about 130 schools. Self-administered surveys were completed during school hours. From each annual 12th grade sample, a sub-sample of about 2,450 respondents was selected each year for follow-up; substance users were oversampled (weighted analyses account for oversampling). Using mailed questionnaires, a random half of each year's follow-up sample was surveyed the year after 12th grade (modal age 19) and the other half two years later (modal age 20). Detailed base-year and follow-up methodology is available elsewhere.^{2,42,43} Appropriate consent procedures were followed and an Institutional Review Board approved the study.

The current study included respondents in 12th grade cohorts from 2006–2016 with the opportunity to provide follow-up data on past 12-month negative alcohol use consequences during 2008–2017. Consequence measures were included on one of six MTF questionnaire forms (distributed randomly). A total of 4,106 respondents were selected for the follow-up study and administered the questionnaire form of interest. Of these, 1,718 individuals (41.8%) responded to follow-up at age 19/20 during 2008–2017. This response rate is considered typical for recent mail data collection efforts, including studies focusing on alcohol-related outcomes.^{44,45} Attrition adjustments are discussed in section 2.3. (Statistical Analysis). Of the 1,718 respondents, 27.5% (n=473) were excluded because they did not report drinking in the past month and therefore did not answer pertinent questions about alcohol consequences; 177 [10.3%] were excluded due to missing data on covariates or outcomes. The total analytical sample included 1,068 respondents.

2.2. Measures

2.2.1. Predictors—*College attendance* at age 19/20 was coded as (1) not attending, (2) attending a 2-year college or a vocational or technical school (2-year/vo-tech), or (3) attending a 4-year college. *Living situation* at age 19/20 was coded as (1) living with parents, (2) living without parents on campus (dorm, fraternity, or sorority), or (3) living without parents off campus. *Binge drinking* at age 19/20 was defined as having 5 or more drinks in a row at least once in the past 2 weeks (yes/no). *Sex* was reported at age 18 and coded as male or female.

2.2.2. Outcomes—The measure of alcohol consequences used in the current study has been asked in MTF since 2008. Respondents were asked: “Think back over the last 12 months. Did your use of alcohol cause you any of the following problems, even just a little?” Fifteen items (Table 1) were listed; respondents marked all that applied. Analyses examined consequences (a) as individual measures and (b) grouped within categories to emphasize conceptual differences in the broad range of individual consequences listed. Five conceptual categories were coded as follows: (1) behave in ways later regretted (single consequence); (2) emotional/physical consequences (five consequences; e.g., less energy); (3) relational consequences (five consequences; e.g., hurt relationship with friends); (4) performance/financial consequences (two consequences; e.g., caused financial difficulties); and (5) driving unsafely (single consequence). Respondents were coded “yes” for each category if one or more of the specific consequences in that category were endorsed. Finally, an overall binary measure indicating any negative consequence endorsement (yes/no) was coded.

2.2.3. Control variables—In addition to the primary predictors, three additional control variables were included in multivariable models: race/ethnicity, region, and year of data collection. Risk for alcohol-related consequences varies significantly across racial/ethnic groups,^{46,47} and alcohol consumption patterns differ by region of the U.S. for young adults² and college students.^{16,20} *Race/ethnicity*, reported at age 18, was coded as White, Black/African American, Hispanic, or Other (other groups, including more than one race/ethnicity, were combined due to sample size limitations). *Region* was based on the state in which the respondent reported living in March of the year of data collection and coded as Northeast, South, Midwest, and West. To account for changes in alcohol consumption across historical time,^{2,48} analyses controlled for *year of data collection*, which was coded into two-year dichotomous indicators (2008–09, 2010–11, 2012–13, 2014–15, and 2016–17).

2.3. Statistical analysis

Analyses were conducted using SAS 9.4 (SAS Institute Inc., Cary, NC). To examine consequence prevalence overall and by subgroup (Aim 1), descriptive statistics were estimated using PROC SURVEYFREQ; unadjusted differences in consequence prevalence were examined using two types of analyses. First, the Rao-Scott chi square test examined overall differences in consequences by college attendance, living situation, binge drinking, and sex. Second, for the consequence outcomes in which a significant Rao-Scott chi-square test was obtained for the three-level predictors of college attendance or living situation, additional unadjusted logistic regression models were fit using PROC SURVEYLOGISTIC to identify significant pair-wise differences. For Aim 2, multivariable logistic regression models were fit for the outcomes of any negative consequence endorsement as well as each of the five consequence categories. For Aim 3, potential interactions of college attendance with living situation, binge drinking, and sex were tested using the full multivariable model; each model tested only one interaction (e.g., college attendance*sex). To account for potential bias due to differential attrition, all analyses included follow-up attrition weights (inverse probability of participation) based on age 18 covariates.⁴⁹

3. Results

In this sample of age 19/20 past 12-month alcohol users, 48.4% (SE 1.72) attended a 4-year college, 24.1% (1.54) attended a 2-year/vo-tech school, and 27.5% (1.59) were non-attenders. Approximately half of respondents (46.5% [1.73]) lived with their parents; 29.0% (1.49) lived on campus without parents, and 24.6% (1.52) lived off campus without parents. The sample was approximately half men (46.6% [1.74]) and predominately White (66.0% [1.75]). Past 2-week binge drinking was reported by 44.1% (1.71) of respondents. Regional distribution was 19.7% (1.34) Northeast; 26.6% (1.47) Midwest; 34.7% (1.69) South, and 19.1% (1.35) West.

3.1. Prevalence of negative alcohol consequences overall and by subgroups

Half (50.3%) of drinkers reported any negative alcohol use consequences in the past 12 months (Table 1). The most commonly-reported negative consequence category was behavior later regretted (38.8%), followed by emotional/physical consequences (29.9%), relational consequences (26.1%), performance/financial consequences (14.5%), and unsafe driving (9.2%).

“Caused you to have less energy” was the most commonly-reported (16.4%) specific emotional/physical consequence. “Caused you to get into an angry argument” was the most commonly-reported (17.6%) relational consequence. Of the performance/financial consequences, “hurt performance in school/on the job” was reported most commonly (11.5%).

Table 2 presents unadjusted differences in consequences by college attendance and living situation; Table 3 presents unadjusted differences by binge drinking and sex. Due to space limitations, discussion of results below is limited to any negative consequence endorsement and each of the five overall consequence categories.

3.1.1. College attendance differences—In unadjusted models, significantly more 4-year college students than non-attenders reported any negative consequences (56.3% vs. 43.0%), behavior later regretted (43.7% vs. 31.5%), emotional/physical consequences (34.0% vs. 25.2%), and performance/financial consequences (18.0% vs. 9.5%) (Table 2). In comparison to 2-year/vo-tech students, 4-year students reported a higher prevalence of any negative consequences (56.3% vs. 46.8%). Two-year/vo-tech students reported a higher prevalence of unsafe driving (15.7%) compared to both 4-year students (7.1%)

3.1.2. Living situation differences—In unadjusted models (Table 2), those living on campus had a higher prevalence than (a) those living with parents of any negative consequences (61.8% vs. 42.1%), behavior later regretted (49.0% vs. 31.9%), emotional/physical consequences (38.1% vs. 24.4%), and performance/financial consequences (20.7% vs. 10.6%); and (b) those living off campus of any negative consequences (61.8% vs. 52.3%). Respondents living off campus had a higher prevalence than those living with parents of reporting any negative consequences (52.3% vs. 42.1%) and behavior later regretted (40.1% vs. 31.9%).

3.1.3. Binge drinking differences—The prevalence of reporting any negative consequences and each of the five consequence categories was significantly higher for binge drinkers (vs. non-binge drinkers) in unadjusted models (Table 3). Yet, a meaningful percentage of non-binge drinkers reported experiencing negative consequences from alcohol use (e.g., 33.0% of non-binge drinkers reported any consequences). models (Table 3). Yet, a meaningful percentage of non-binge drinkers reported experiencing negative consequences from alcohol use (e.g., 33.0% of non-binge drinkers reported any consequences).

3.1.4. Sex differences—When looking at any negative consequences and each of the five overall consequence categories, only one difference was found by sex in unadjusted models; women had a higher prevalence than men of emotional/physical consequences (33.9% vs. 25.3%; Table 3).

3.2. Multivariable differences in negative consequence endorsement

Multivariable associations are reported in Table 4 for any negative consequence endorsement and each of the five overall consequence categories (specific items not modeled). In the multivariable context, the only consequence category showing significant differences in likelihood by college attendance was unsafe driving. Odds of unsafe driving continued to be significantly higher for 2-year/vo-tech students than non-attenders, and (in an additional model not shown using 4-year college students as the referent category) those attending 4-year colleges (AOR 2.04, 95% CI 1.10–3.78, $p=0.023$). Respondents living with parents had significantly lower odds than those living on or off campus of any consequences and behavior later regretted; lower odds than those living on campus of emotional/physical consequences and performance/financial consequences; and lower odds than those living off campus of relational consequences. No significant differences in consequence likelihood were found between respondents living on versus off campus (data not shown). Binge drinkers continued to have significantly higher odds of all consequence categories consistent with what was found in unadjusted associations. Finally, men continued to report significantly lower odds than women of emotional/physical consequences; additional sex differences became significant for any consequences as well as behavior later regretted, with men reporting significantly lower odds of these outcomes than women.

A series of step-wise regression models were fit (see Supplemental Table 1) to explore which covariate(s) had an impact on the statistical association between college attendance and alcohol consequence categories: Step 1 controlled for sex, race/ethnicity, region, and year; Step 2 added binge drinking; Step 3 removed binge drinking and added living situation; and Step 4 included both binge drinking and living situation. Results clearly indicated that most college attendance/consequence associations continued to be significant until controlling for living situation, after which only unsafe driving remained significant. Further, step-wise models indicated that after controlling for binge drinking significant associations for sex with any consequences and sex with behavior later regretted emerged such that men were less likely to endorse any consequences and specifically endorse behavior later regretted.

3.3. College status interactions with living situation, binge drinking, and sex

Interactions between college attendance and living situation, binge drinking, and sex were examined using the full multivariable model for all Table 4 outcomes (results not shown). No significant interactions were observed.

4. Discussion

Entering young adulthood constitutes a critical developmental transition^{3,50} associated with escalating alcohol use and potential for negative consequences. The current U.S. national study of 19/20 year-old alcohol users indicated that fully half reported experiencing negative consequences from their own alcohol use in the past 12 months. Before controlling for key covariates, non-attenders had lower risk than 4-year college students of several consequence categories, but unsafe driving was most likely among 2-year/vo-tech students. Other than unsafe driving, these associations became non-significant after controlling for covariates, particularly living situation. Women, binge drinkers, and those not living with parents are at higher risk for a range of negative alcohol use consequences.

Elevated risk of negative alcohol use consequences among young adults is concerning for at least three reasons. First, many young adults show symptoms of and may meet criteria for alcohol use disorder,¹ but they are less likely than older or younger individuals to receive substance use treatment.^{51–53} Second, as alcohol users may underreport self-attributed negative consequences to their own use,⁵⁴ the prevalence levels reported here may be conservative estimates of the consequences young adults experience. Third, alcohol use consequences may impede completion of developmental tasks associated with the transition to adulthood,^{3,55} with potentially long-term consequences for the successful assumption of adulthood roles. Significant differences in consequences by key characteristics—college attendance, living situation, binge drinking, and sex—highlight increased public health burdens borne by specific subgroups.

The current study provides important national data on the prevalence of specific negative alcohol use consequences among young adult drinkers across 4-year college students (the group considered by most relevant etiologic research), 2-year/vo-tech students, and non-attenders. As noted previously, most prior research on negative alcohol use consequences has focused on 4-year college student populations,^{14–16,56–58} with some key studies also examining other populations.^{17–19} The current study's findings indicate that the total percentage of young adult drinkers dealing with negative alcohol use consequences (particularly emotional/physical consequences and performance/financial consequences) may be higher among 4-year students than non-attenders, while the percentage of drinkers reporting unsafe driving due to alcohol use may be particularly high among 2-year/vo-tech students. Even so, approximately 2 out of every 5 non-attending young adult drinkers reported negative consequences from their alcohol use, highlighting the need for intervention and prevention efforts across both college and non-college populations. Calls to U.S. colleges and universities have emphasized the need to focus on reducing student alcohol use during the transition to college using more than prevention messaging.^{59–60} Educational, individual and environmental interventions to reduce harms associated with heavy alcohol use are on-going but with limited evidence of success.⁶¹ The current study's findings

indicate that intervention and prevention efforts addressing the negative consequences of alcohol use are important for all post-secondary educational institutions and for non-attending young adults.

The current study found that many of the significant unadjusted associations between college attendance and consequence categories became insignificant after controlling for covariates, particularly living situation. The finding that alcohol use consequences were less prevalent among young adults still living with parents (vs. not) is in line with prior research indicating both the importance of parental monitoring,³² peer influence,⁶² and other environmental factors such as alcohol outlet density near college campuses.³⁵ Future research should examine the ways in which these factors may impact the risks young adult drinkers are willing to take while drinking, as well as their use of protective behavioral strategies to mitigate the negative aspects of alcohol use.

The one consequence that retained significant associations with college attendance was unsafe driving. Fully 1 in 7 young adult alcohol users who attended 2-year/vo-tech schools reported unsafe driving due to alcohol use, compared to less than 1 in 10 young adult alcohol users either not attending school/college or attending 4-year colleges. This difference is in line with earlier work by Blowers¹⁸ and may be due to 2-year/vo-tech students being more likely to commute to school and other social events.⁶³ Of all consequences examined in the current study, unsafe driving has the highest likelihood of affecting not only the alcohol user themselves, but also others around them. The prevalence of alcohol-impaired driving and associated fatalities has decreased in recent years for the U.S. overall,^{64,65} but the results of the current study indicate that more needs to be done to address this high-risk behavior, particularly among 2-year/vo-tech students. Such individuals may be especially likely to be put in situations where driving after drinking is a likely behavior, and need strategies to help them avoid it.

While high-risk drinking behaviors are reported more frequently by young adult men than women,^{2,38,48} the current study found that women were more likely to report negative consequences from their alcohol use (any consequence endorsement, behavior later regretted, and emotional/physical consequences) than men, once the overall quantity of alcohol was controlled for. In prior research examining sex differences in negative alcohol use consequences among college students, women were more likely to experience regret and feelings of sadness, depression, or that they had disappointed others.⁴¹ In the current study, the emotional/physical consequence category included two specific emotional consequences that evidenced significant unadjusted differences: women were more likely than men to report the consequences of less stable emotionally; and feel depressed/anxious/ashamed. Alcohol-related interventions with young adult women should particularly address self-worth, shame, and depression.

4.1. Limitations

These findings are subject to several limitations. All data were self-report. In addition, the sample was drawn from 12th graders; high school dropouts were not included, although dropout is associated with alcohol use and binge drinking.^{66,67} Further, as in all follow-up studies, differential attrition based on substance use likely makes the estimates of negative

consequences conservative (although attrition weights helped address this limitation). Sample sizes precluded the ability to further differentiate several key measures of interest, such as potential differences in alcohol consequences between community college students and those at vo-tech schools, or those living on campus in fraternities/sororities versus those living on campus in school dorms not associated with Greek systems, or those living alone. Issues of student status (full- vs. part-time) were also not included in the current models, although initial analyses showed that this distinction was not a significant predictor in the context of 2- vs 4-year colleges. Limitations notwithstanding, by using U.S. national multi-cohort data, this study brings new information about the prevalence and characteristics of negative alcohol use consequences among underage drinkers.

5. Conclusion

These findings regarding negative alcohol consequences experienced by young adults provide (a) important information about the public health burden of alcohol use and (b) evidence of the need for interventions addressing negative alcohol use consequences across college and non-college settings. Among young adult drinkers, not living with parents and being female were associated with increased risk of negative consequences overall, and 2-year/vo-tech students were at particular risk for unsafe driving. Future research should address whether the negative consequences experienced at age 19/20 continue across young adulthood, and whether and for whom they are associated with future alcohol use disorders as well as overall difficulties in adulthood

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- Half of age 19/20 drinkers reported negative alcohol use consequences.
- 1/3 of non-binge and nearly 3/4 of binge drinkers reported negative consequences.
- Vo-tech and 2-year college students reported more unsafe driving.
- Negative consequences were more likely for women than men.
- Negative consequences were less likely for those living with parents.

Table 1.

Negative Alcohol Use Consequence Endorsement among Age 19/20 Past 12-month Alcohol Users, Overall

| | <u>% (SE)</u> |
|--|---------------|
| <i>Any consequence endorsement</i> | 50.3 (1.73) |
| <i>Caused you to behave in ways that you later regretted</i> | 38.8 (1.66) |
| <i>Any emotional/physical consequences</i> | 29.9 (1.56) |
| Caused you to have less energy | 16.4 (1.21) |
| Caused you to be less stable emotionally | 13.2 (1.11) |
| Made you feel bad (e.g., depressed, anxious, ashamed) | 8.9 (0.94) |
| Caused your physical health to be bad | 6.3 (0.92) |
| Caused you to be less interested in other activities | 5.8 (0.79) |
| <i>Any relational consequences</i> | 26.1 (1.51) |
| Caused you to get into angry argument | 17.6 (1.33) |
| Hurt relationship with spouse/fiancée/girlfriend/boyfriend | 12.9 (1.18) |
| Hurt relationships with friends | 8.0 (0.88) |
| Hurt relationship with parents | 6.2 (0.76) |
| Hurt relationship with children | 0.7 (0.31) |
| <i>Any performance/financial consequences</i> | 14.5 (1.13) |
| Hurt performance in school/on the job | 11.5 (1.04) |
| Caused financial difficulties | 5.4 (0.73) |
| <i>Caused you to drive unsafely</i> | 9.2 (1.05) |

Notes: Unweighted $n = 1,068$.

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Table 2.

Negative Alcohol Use Consequence Endorsement among Age 19/20 Past 12-month Alcohol Users, by College Attendance and Living Situation

| | By College Attendance | | | By Living Situation | | | p |
|--|-----------------------|----------------------------------|----------------------------|---------------------|----------------------------------|-----------------------------------|--------|
| | Not attending % (SE) | 2-year college or vo-tech % (SE) | 4-year college % (SE) | With parents % (SE) | On campus without parents % (SE) | Off campus without parents % (SE) | |
| <i>Any consequence endorsement</i> | 43.0 (3.38) | 46.8 (3.71) | 56.3 (2.33) ^{b,c} | 42.1 (2.57) | 61.8 (2.89) ^d | 52.3 (3.61) ^{de} | <0.001 |
| <i>Caused you to behave in ways that you later regretted</i> | 31.5 (3.04) | 37.4 (3.64) | 43.7 (2.30) ^b | 31.9 (2.42) | 49.0 (2.96) ^d | 40.1 (3.41) ^d | <0.001 |
| <i>Any emotional/physical consequences</i> | 25.2 (2.91) | 26.9 (3.42) | 34.0 (2.17) ^b | 24.4 (2.29) | 38.1 (2.84) ^d | 30.6 (3.17) | 0.001 |
| Caused you to have less energy | 11.8 (2.14) | 12.3 (2.28) | 21.1 (1.85) ^{b,c} | 11.4 (1.58) | 21.5 (2.35) ^d | 19.9 (2.74) ^d | 0.001 |
| Caused you to be less stable emotionally | 10.9 (2.02) | 13.4 (2.38) | 14.4 (1.58) | 9.4 (1.43) | 15.9 (2.11) ^d | 17.3 (2.57) ^d | 0.005 |
| Made you feel bad (e.g., depressed, anxious, ashamed) | 8.9 (1.87) | 11.2 (2.29) | 7.8 (1.15) | 9.3 (1.50) | 8.3 (1.51) | 8.9 (1.84) | 0.893 |
| Caused your physical health to be bad | 4.1 (1.31) | 9.6 (2.80) | 5.8 (1.02) | 6.6 (1.63) | 6.5 (1.41) | 5.4 (1.31) | 0.832 |
| Caused you to be less interested in other activities | 6.5 (1.59) | 5.7 (1.72) | 5.4 (1.04) | 5.4 (1.18) | 6.1 (1.47) | 6.1 (1.51) | 0.902 |
| <i>Any relational consequences</i> | 27.3 (3.07) | 27.2 (3.43) | 24.8 (1.94) | 22.9 (2.28) | 27.1 (2.54) | 30.9 (3.24) | 0.092 |
| Caused you to get into angry argument | 18.5 (2.63) | 18.2 (3.16) | 16.7 (1.67) | 15.3 (2.04) | 18.5 (2.19) | 20.8 (2.78) | 0.208 |
| Hurt relationship with spouse/fiancée/girlfriend/boyfriend | 13.2 (2.35) | 14.6 (2.95) | 11.9 (1.39) | 11.5 (1.83) | 12.2 (1.81) | 16.3 (2.55) | 0.225 |
| Hurt relationships with friends | 5.6 (1.38) | 9.6 (2.13) | 8.6 (1.24) | 6.6 (1.29) | 9.9 (1.67) | 8.4 (1.73) | 0.271 |
| Hurt relationship with parents | 7.4 (1.54) | 7.6 (1.81) | 4.9 (0.93) | 5.7 (1.12) | 5.6 (1.25) | 8.0 (1.69) | 0.387 |
| Hurt relationship with children | 0.9 (0.48) | 1.2 (0.98) | 0.3 (0.29) | 0.9 (0.55) | 0.6 (0.50) | 0.5 (0.32) | 0.808 |
| <i>Any performance/financial consequences</i> | 9.5 (1.77) | 13.2 (2.38) | 18.0 (1.73) ^b | 10.6 (1.54) | 20.7 (2.36) ^d | 14.5 (2.18) | 0.001 |
| Hurt performance in school/on the job | 7.0 (1.51) | 11.5 (2.28) | 14.1 (1.58) ^b | 8.4 (1.39) | 16.4 (2.20) ^d | 11.8 (1.98) | 0.004 |
| Caused financial difficulties | 3.5 (1.08) | 5.2 (1.58) | 6.5 (1.12) | 4.5 (1.05) | 7.3 (1.51) | 4.6 (1.29) | 0.217 |
| <i>Caused you to drive unsafely</i> | 7.1 (1.62) | 15.7 (3.05) ^b | 7.1 (1.18) ^c | 10.6 (1.81) | 5.6 (1.33) | 10.6 (1.99) | 0.065 |

Notes: Unweighted n = 1,068.

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χ^2 values from Rao-Scott chi square tests of differences in the percentage of respondents in each category of the independent variable (i.e., college attendance or sex) reporting the specified consequence; if $p < 0.05$, estimates are presented in bold font.

q Indicates significant ($p < 0.05$) differences between specified college attendance category and not attending in bivariate logistic regression models.

r Indicates significant ($p < 0.05$) differences between specified college attendance category and 2-year/vo-tech in bivariate logistic regression models.

p Indicates significant ($p < 0.05$) differences between specified living situation category and with parents in bivariate logistic regression models.

s Indicates significant ($p < 0.05$) differences between specified living situation category and on campus without parents in bivariate logistic regression models.

Table 3. Negative Alcohol Use Consequence Endorsement among Age 19/20 Past 12-month Alcohol Users, by Binge Drinking and Sex

| | By Binge Drinking | | By Sex | | <i>p</i> |
|--|-------------------|--------------|--------------|-------------------|----------------|
| | No binge % (SE) | Binge % (SE) | Women % (SE) | Men % (SE) | |
| <i>Any consequence endorsement</i> | 33.0 (2.13) | 72.3 (2.28) | 52.7 (2.20) | 47.6 (2.70) | 0.144 |
| <i>Caused you to behave in ways that you later regretted</i> | 21.9 (1.82) | 60.3 (2.49) | 40.5 (2.14) | 37.0 (2.58) | 0.299 |
| <i>Any emotional/physical consequences</i> | 18.8 (1.73) | 44.0 (2.54) | 33.9 (2.04) | 25.3 (2.38) | 0.008 |
| Caused you to have less energy | 10.4 (1.35) | 24.1 (2.10) | 17.6 (1.61) | 15.1 (1.83) | 0.312 |
| Caused you to be less stable emotionally | 7.7 (1.17) | 20.2 (1.98) | 17.3 (1.62) | 8.6 (1.45) | < 0.001 |
| Made you feel bad (e.g., depressed, anxious, ashamed) | 5.5 (1.00) | 13.3 (1.68) | 11.2 (1.37) | 6.3 (1.25) | 0.012 |
| Caused your physical health to be bad | 2.6 (0.68) | 10.9 (1.85) | 5.2 (0.92) | 7.5 (1.66) | 0.207 |
| Caused you to be less interested in other activities | 2.6 (0.67) | 9.8 (1.53) | 4.5 (0.84) | 7.2 (1.38) | 0.077 |
| <i>Any relational consequences</i> | 15.0 (1.67) | 40.2 (2.51) | 26.3 (1.91) | 25.9 (2.40) | 0.903 |
| Caused you to get into angry argument | 8.4 (1.26) | 29.2 (2.38) | 17.3 (1.64) | 17.9 (2.14) | 0.840 |
| Hurt relationship with spouse/fiancée/girlfriend/boyfriend | 6.9 (1.20) | 20.5 (2.12) | 14.0 (1.45) | 11.7 (1.91) | 0.351 |
| Hurt relationships with friends | 4.2 (0.86) | 12.8 (1.64) | 9.2 (1.21) | 6.7 (1.27) | 0.165 |
| Hurt relationship with parents | 3.5 (0.75) | 9.7 (1.41) | 6.4 (1.03) | 6.0 (1.11) | 0.807 |
| Hurt relationship with children | 0.3 (0.20) | 1.2 (0.64) | 0.77 | 1.3 (0.62) | 0.046 |
| <i>Any performance/financial consequences</i> | 6.4 (1.05) | 24.8 (2.11) | 14.9 (1.49) | 14.0 (1.73) | 0.691 |
| Hurt performance in school/on the job | 4.8 (0.91) | 20.1 (1.97) | 11.6 (1.34) | 11.4 (1.61) | 0.937 |
| Caused financial difficulties | 2.1 (0.61) | 9.5 (1.44) | 5.5 (0.97) | 5.2 (1.10) | 0.824 |
| <i>Caused you to drive unsafely</i> | 4.4 (0.90) | 15.2 (2.02) | 7.6 (1.15) | 10.9 (1.82) | 0.110 |

Notes: Unweighted *n* = 1,068.

^a *P*-values from Rao-Scott chi square tests of differences in the percentage of respondents in each category of the independent variable (i.e., binge drinking or living situation) reporting the specified consequence; if *p*<0.05, estimates are presented in bold font.

Table 4.

Multivariable Associations with Negative Consequence Endorsement among Age 19/20 Past 12-month Alcohol Users: Adjusted Odds Ratios and P-values

| | AOR | (95% CI) | P | AOR | (95% CI) | P | AOR | (95% CI) | P |
|---------------------------------|---------------------------|---------------------|------------------|--------------------------|---------------------|------------------|--|---------------------|------------------|
| | Any negative consequences | | | Behavior later regretted | | | Any negative emotional/physical consequences | | |
| College attendance ^a | | | | | | | | | |
| Not attending | (ref) | | | (ref) | | | (ref) | | |
| 2-year/vo-tech | 1.21 | (0.79, 1.87) | 0.384 | 1.38 | (0.89, 2.13) | 0.147 | 1.08 | (0.68, 1.72) | 0.753 |
| 4-year college | 1.15 | (0.76, 1.76) | 0.506 | 1.16 | (0.76, 1.76) | 0.492 | 1.03 | (0.67, 1.58) | 0.906 |
| Living situation ^b | | | | | | | | | |
| With parents | (ref) | | | (ref) | | | (ref) | | |
| On campus | 1.92 | (1.27, 2.91) | 0.002 | 1.88 | (1.22, 2.89) | 0.004 | 1.67 | (1.09, 2.55) | 0.018 |
| Off campus | 1.60 | (1.08, 2.37) | 0.019 | 1.50 | (1.01, 2.22) | 0.042 | 1.33 | (0.88, 2.01) | 0.176 |
| Binge drinking ^c | | | | | | | | | |
| None | (ref) | | | (ref) | | | (ref) | | |
| Any | 5.5 | (4.06, 7.45) | <.0001 | 5.5 | (4.06, 7.44) | <.0001 | 3.56 | (2.60, 4.87) | <.0001 |
| Sex | | | | | | | | | |
| Female | (ref) | | | (ref) | | | (ref) | | |
| Male | 0.65 | (0.48, 0.88) | 0.005 | 0.69 | (0.51, 0.93) | 0.016 | 0.55 | (0.40, 0.76) | 0.000 |
| Race/ethnicity | | | | | | | | | |
| Black | 1.01 | (0.54, 1.89) | 0.966 | 0.69 | (0.35, 1.39) | 0.304 | 0.98 | (0.45, 2.13) | 0.954 |
| Hispanic | 1.15 | (0.71, 1.86) | 0.575 | 1.25 | (0.78, 1.99) | 0.357 | 1.08 | (0.64, 1.80) | 0.782 |
| Other | 0.73 | (0.43, 1.23) | 0.240 | 0.73 | (0.44, 1.23) | 0.239 | 1.27 | (0.76, 2.11) | 0.360 |
| White | (ref) | | | (ref) | | | (ref) | | |
| Region | | | | | | | | | |
| Northeast | 1.46 | (0.96, 2.23) | 0.076 | 1.28 | (0.83, 1.98) | 0.264 | 1.10 | (0.71, 1.71) | 0.670 |
| Midwest | 1.14 | (0.78, 1.66) | 0.505 | 1.03 | (0.69, 1.54) | 0.871 | 1.19 | (0.80, 1.78) | 0.386 |
| West | 1.09 | (0.69, 1.71) | 0.712 | 0.94 | (0.61, 1.45) | 0.773 | 0.93 | (0.58, 1.49) | 0.768 |
| South | (ref) | | | (ref) | | | (ref) | | |
| Year of data collection | | | | | | | | | |

| | AOR | (95% CI) | P | AOR | (95% CI) | P | AOR | (95% CI) | P |
|--------------------------------|-------------|---------------------|----------------|-------------|---------------------|----------------|-------------|---------------------|----------------|
| 2008–2009 | 1.11 | (0.69, 1.78) | 0.664 | 1.12 | (0.69, 1.81) | 0.656 | 1.00 | (0.62, 1.59) | 0.988 |
| 2010–2011 | 1.27 | (0.78, 2.07) | 0.334 | 1.36 | (0.82, 2.26) | 0.233 | 1.39 | (0.84, 2.29) | 0.202 |
| 2012–2013 | 0.85 | (0.52, 1.38) | 0.504 | 1.05 | (0.63, 1.75) | 0.841 | 0.78 | (0.47, 1.30) | 0.344 |
| 2014–2015 | 1.08 | (0.64, 1.82) | 0.786 | 1.28 | (0.74, 2.22) | 0.38 | 1.24 | (0.74, 2.11) | 0.416 |
| 2016–2017 | (ref) | | | (ref) | | | (ref) | | |
| College attendance | | | | | | | | | |
| Not attending | (ref) | | | (ref) | | | (ref) | | |
| 2-year/vo-tech | 1.04 | (0.64, 1.67) | 0.886 | 1.53 | (0.82, 2.85) | 0.183 | 2.51 | (1.29, 4.89) | 0.007 |
| 4-year college | 0.65 | (0.42, 1.02) | 0.063 | 1.37 | (0.79, 2.35) | 0.263 | 1.23 | (0.63, 2.41) | 0.550 |
| Living situation | | | | | | | | | |
| With parents | (ref) | | | (ref) | | | (ref) | | |
| On campus | 1.39 | (0.89, 2.18) | 0.144 | 1.78 | (1.06, 2.97) | 0.029 | 0.58 | (0.28, 1.18) | 0.134 |
| Off campus | 1.54 | (1.01, 2.36) | 0.045 | 1.36 | (0.83, 2.23) | 0.224 | 1.18 | (0.67, 2.09) | 0.564 |
| Binge drinking | | | | | | | | | |
| None | (ref) | | | (ref) | | | (ref) | | |
| Any | 4.22 | (3.00, 5.95) | < 0.001 | 4.81 | (3.14, 7.36) | < 0.001 | 4.30 | (2.50, 7.41) | < 0.001 |
| Sex | | | | | | | | | |
| Female | (ref) | | | (ref) | | | (ref) | | |
| Male | 0.83 | (0.59, 1.15) | 0.258 | 0.82 | (0.55, 1.20) | 0.300 | 1.31 | (0.79, 2.17) | 0.302 |
| Race/ethnicity | | | | | | | | | |
| Black | 1.40 | (0.67, 2.96) | 0.372 | 0.82 | (0.36, 1.91) | 0.65 | 0.99 | (0.27, 3.72) | 0.991 |
| Hispanic | 1.10 | (0.64, 1.87) | 0.735 | 1.50 | (0.77, 2.93) | 0.239 | 1.74 | (0.82, 3.67) | 0.147 |
| Other | 0.72 | (0.40, 1.31) | 0.284 | 1.28 | (0.68, 2.42) | 0.442 | 0.81 | (0.33, 1.98) | 0.637 |
| White | (ref) | | | (ref) | | | (ref) | | |
| Region | | | | | | | | | |
| Northeast | 0.89 | (0.57, 1.40) | 0.619 | 0.95 | (0.55, 1.66) | 0.859 | 0.73 | (0.35, 1.53) | 0.397 |
| Midwest | 0.92 | (0.60, 1.41) | 0.693 | 1.11 | (0.70, 1.74) | 0.667 | 1 | (0.50, 1.99) | 0.999 |
| West | 0.73 | (0.45, 1.19) | 0.203 | 0.43 | (0.23, 0.82) | 0.011 | 0.90 | (0.44, 1.84) | 0.780 |
| South | (ref) | | | (ref) | | | (ref) | | |
| Year of data collection | | | | | | | | | |

| | AOR | (95% CI) | P | AOR | (95% CI) | P | AOR | (95% CI) | P |
|-----------|-------|--------------|-------|-------|--------------|-------|-------------|----------------------|--------------|
| 2008–2009 | 1.44 | (0.86, 2.43) | 0.168 | 1.23 | (0.69, 2.20) | 0.482 | 5.32 | (1.53, 18.46) | 0.009 |
| 2010–2011 | 1.18 | (0.69, 2.03) | 0.54 | 1.03 | (0.56, 1.92) | 0.917 | 4.25 | (1.17, 15.48) | 0.028 |
| 2012–2013 | 1.17 | (0.68, 2.03) | 0.573 | 1.23 | (0.65, 2.31) | 0.527 | 3.12 | (0.87, 11.24) | 0.081 |
| 2014–2015 | 0.93 | (0.51, 1.70) | 0.81 | 0.74 | (0.37, 1.51) | 0.41 | 4.65 | (1.25, 17.24) | 0.022 |
| 2016–2017 | (ref) | | | (ref) | | | (ref) | | |

Notes: Unweighted $n = 1,068$. Bold font indicates significant ($p < .05$ or stronger) associations between noted variable and consequence endorsement. AOR = Adjusted odds ratio from multivariable models simultaneously including all noted variables.

^aCollege attendance defined as not attending, attending a vocational/technical school or 2-year college, or attending a 4-year college.

^bLiving situation defined as living with parents, living on campus without parents, or living off campus without parents.

^cBinge drinking within the past two weeks.