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Does College Alcohol Consumption Impact Employment Upon Graduation? Findings From a Prospective Study

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Abstract

Although scholars have extensively studied the impact of academic and vocational factors on college students' employment upon graduation, we still know little as to how students' health-related behaviors influence such outcomes. Focusing on student alcohol use as a widely prevalent, health-related behavior, in the current study, we examined the employment implications of student drinking behavior. Drawing from literature examining the productivity effects of drinking and research on job search, we posited that modal quantity and frequency of alcohol consumption, as well as the frequency of heavy episodic drinking (HED) adversely impact the probability of employment upon graduation. Using data from 827 graduating seniors from 4 geographically diverse universities in the United States collected in the context of a prospective study design, we found modal alcohol consumption to have no adverse effect on the likelihood of employment upon graduation. However, we did find a significant adverse effect for the frequency of heavy drinking, with the data suggesting a roughly 10% reduction in the odds of employment upon graduation among college seniors who reported engaging in the average level of HED. The theoretical and practical implications of these findings are discussed.

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Keywords

alcohol; employment; college student; health-related behavior

Graduates of 4-year college programs in the United States in 2016, 68.5% of whom plan to pursue employment, represent a significant proportion of new entrants to the domestic labor force (National Association of Colleges & Employers, 2016; Spreen, 2013). The same is true abroad, with recent college graduates representing nearly 50% of new urban labor-market entrants in China (World Bank & Development Research Center of the State Council, People's Republic of China, 2014). College graduates have traditionally fared better than nongraduates in labor markets (Scarpetta et al., 2012). However, since the recession of 2008, recent college graduates in the United States have experienced significant challenges in securing employment, with only 46% of graduating seniors reporting having received a job offer prior to graduation in 2016 (as compared with 51% of graduating seniors in 2015; National Association of Colleges & Employers, 2016), and about 10% of 22-year-old college graduates reporting being unemployed during 2009 – 2011 (vs. just above 4% in 1990 and 2000; Abel, Deitz, & Su, 2014). Even though employment prospects have improved, they have yet to approach prerecession levels (Abel et al., 2014; Carnevale & Cheah, 2015), contributing to an increase in the underemployment rate of recent college graduates (Abel et al., 2014) and limiting their wages and longer term career prospects and earnings potential (Altonji, Kahn, & Speer, 2016; Nunley, Pugh, Romero, & Seals, 2017; Oreopoulos, von Wachter, & Heisz, 2012).

Such trends highlight the growing importance of understanding the factors underlying the employment of young adults upon their graduation from college. Studies examining the predictors of graduates' employment outcomes indicate that academic major (Kim, Tamborini, & Sakamoto, 2015; Sagen, Dallam, & Laverty, 2000), academic performance (Fang, Lee, Lee, & Huang, 2004), demographics (Mau & Kopischke, 2001; Zhang, 2008), and personality (Brown, Cober, Kane, Levy, & Shalhoop, 2006) all influence employment outcomes upon graduation. In addition, research suggests that job-search skills, behavior, and cognitions (Jackson, Hall, Rowe, & Daniels, 2009; Liu, Wang, Liao, & Shi, 2014) and internship experiences (Godofsky, Zukin, & Van Horn, 2011; Nunley, Pugh, Romero, & Seals, 2016) also play important roles. However, little is known about the impact of students' health-related behavior (e.g., alcohol consumption, smoking, exercise; Cutler & Glaeser, 2005) on employment. To the extent that the level or frequency of engagement in such behavior may be associated with students' attitudes and behaviors regarding seeking employment, it is possible that involvement in such activities may also affect their employment prospects. Here, we focus on a health-related behavior that is highly prevalent among college students, namely drinking.

Alcohol use among college students is a significant health concern in the United States and other countries (Karam, Kypri, & Salamoun, 2007; Ståhlbrandt et al., 2008). In the United States, college students consistently report engaging in more frequent heavy drinking than their noncollege peers (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2015). A survey of over 14,000 students at 119 United States colleges found that 31% met criteria for

alcohol misuse and 6% for a dependence diagnosis (Knight et al., 2002). Studies have consistently categorized 40–45% of United States college students as heavy episodic (binge) drinkers (Wechsler & Nelson, 2008), with prevalence rates of binge drinking above 20% reported in other countries as well (e.g., Bendtsen, Johansson, & Åkerlind, 2006; D'Alessio, Baiocco, & Laghi, 2006; Keller, Maddock, Laforge, Velicer, & Basler, 2007; Kypri et al., 2009). For example, 24% of first-year German medical students reported engaging in heavy episodic drinking (HED) at least once in the previous 2 weeks (Keller et al., 2007). Although the health (Wechsler & Nelson, 2008) and economic (Francesconi, 2015) implications of alcohol misuse have been widely studied and are well-known, we know little about the employment implications of such behavior. Specifically, little is known as to whether the way in which college students drink or the amounts they consume is related to their employment upon graduation. Findings regarding the broader question of how alcohol affects employment in general also remain equivocal, with some studies concluding that drinking behavior is positively related to employment and others finding adverse or null effects (Popovici & French, 2013).

Given the inconsistent findings on drinking behavior and employment status, in the current study, we derived testable hypotheses from research on the broader productivity effects of drinking (Frone, 2008) and on job search (Kanfer, Wanberg, & Kantrowitz, 2001; van Hooft, Wanberg, & van Hoye, 2013). We proposed that both how much alcohol is consumed on a modal basis (i.e., average frequency of alcohol consumption in a given period of time, and/or the average quantity consumed across drinking occasions), and *how* that alcohol is consumed (i.e., frequency of HED, or binges) are likely to impact employment upon graduation. We tested these hypotheses using a prospective study design, using data from 827 graduating seniors from four geographically diverse universities in the United States. The findings from these analyses offer insight into the broader, yet still largely unresolved question of whether alcohol use affects employment. In addition, they may facilitate more targeted substance-misuse prevention and treatment efforts on college campuses, assist policymakers and college administrators in more effectively communicating the risks of alcohol misuse to students, and inform alcohol-related policy and practice among employers engaging in college recruiting.

Alcohol Use/Misuse and Employment

The link between drinking behavior and employment status has been widely explored, with most scholars positing adverse effects based on the notion that alcohol use and misuse can result in negative productivity-related outcomes, thus making it disadvantageous for employers to hire or retain such employees. For example, studies have found more frequent episodes of heavy drinking, typically defined as a pattern of drinking that brings blood alcohol concentration (BAC) levels to ≥0.08 g/dL, or four or more drinks for women and five or more drinks for men on a given 2-hr drinking occasion (National Institute on Alcohol Abuse and Alcoholism, *Drinking Levels Defined*, n.d., para. 2) to be associated with a higher rate of absenteeism (Bacharach, Bamberger, & Biron, 2010), and reduced task and contextual performance (Frone, 2008). To the degree that drinking may be associated with such adverse outcomes, the risk of job loss may be higher among those engaging in such behavior (Hanisch, 1999). Furthermore, unemployed individuals may have greater difficulty

securing alternative employment to the extent that misuse impairs their job search (Hanisch, 1999; Wanberg, Zhu, Kanfer, & Zhang, 2012).

Despite the intuitive appeal of this argument, empirical support for it remains inconsistent. Whereas several studies have indicated that alcohol misuse adversely affects employment status (Johansson, Alho, Kiiskinen, & Poikolainen, 2007; MacDonald & Shields, 2004), others had findings of either no association or a beneficial effect (Berger & Leigh, 1988; Feng, Zhou, Butler, Booth, & French, 2001; Mullahy & Sindelar, 1996). One explanation is that drinking's effects on employment varies depending on how employment is operationalized, with some studies examining employment status (e.g., Feng et al., 2001), and others focusing on hours of work (e.g., Kenkel, Ribar, Cook, & Peltzman, 1994) or earnings (Berger & Leigh, 1988). Another explanation is study design; many previous studies relied on cross-sectional data (thus making it impossible to rule out reverse causality) or did little to take endogeneity into account.

In the current study, we attempted to reduce the risks of reverse causality and endogeneity by examining the impact of college alcohol use on employment upon graduation. Although approximately 60% of students enrolled in college are employed, the majority of these working students hold part-time sales and office-support or food- and personal-service positions (Carnevale, Smith, Melton, & Price, 2015). Given that working students typically hold such noncareer jobs during college, job loss is less likely a risk factor for alcohol misuse in a student sample such as ours, hence reducing the risk of reverse causation. Furthermore, education—a key endogenous variable—is naturally controlled when examining alcohol–employment relations among students.

Student Drinking Behavior and Employment Upon Graduation

Although alcohol use is widely prevalent on and around college campuses (Wechsler & Nelson, 2008), data on modal alcohol consumption suggest that most students regularly consume alcohol on a moderate basis (Sonnenstuhl, 2016). For example, Meilman, Presley, and Cashin (1997) found that nearly 60% of men and 75% of women attending 4-year colleges consumed, on average, under five drinks per week. Similarly, Wechsler, Molnar, Davenport, and Baer (1999) found that students consumed a mean number of 5.1 drinks per week. These mean quantities of alcohol consumption are well below the cutoffs of seven and 14 drinks per week as specified by the National Institute on Alcohol Abuse and Alcoholism, n.d., *Drinking Levels Defined* (para. 5), for low-risk drinking for women and men, respectively. In terms of the modal frequency of consumption, the norm for students at most universities (i.e., 55%) is consumption of alcohol on a monthly basis (i.e., once or twice per month), with just 29% of universities having a more frequent alcohol-consumption norm among their students (i.e., once or more per week, Perkins, Meilman, Leichliter, Cashin, & Presley, 1999). Research findings also indicate that only 10% of students drink on weekdays, with even those categorized as heavy drinkers consuming an average of only one drink a day from Sunday through Wednesday (Hoeppner et al., 2012).

As students tend to consume alcohol irregularly, in considering the effects of drinking on employment outcomes, it may also be important to consider the frequency of HED. Research on HED frequency has indicated that 35% (Johnston et al., 2015) to 39% (United

States Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, 2014) of United States college students engage in such behavior. Specifically, 43% of college students reportedly drank to intoxication in the past month (Johnston et al., 2015), and about 23% engaged in binge drinking three or more times in the past 2 weeks (Wechsler et al., 2002). Moreover, as Wechsler and Nelson (2008, p. 483) reported, “binge drinkers consumed 91% of all the alcohol that students reported drinking.”

Both modal consumption and frequency of HED may be linked to employment outcomes. For example, student drinking behavior may link to employment by influencing job search—defined by Saks (2006, p. 400) as a process that consists of “gathering information in the pursuit of potential job opportunities, generating and evaluating job alternatives, and choosing a job from these alternatives.” Because the job-search process is “highly autonomous, self-organized, loosely structured, and ill-defined” (Wanberg et al., 2012, p. 262), it is highly susceptible to variance in self-regulation (Kanfer et al., 2001). As another example, employment outcomes may also be adversely affected if drinking behavior hinders the self-regulation required for academic performance (Pintrich & Zusho, 2007).

Studies have suggested that higher levels of alcohol consumption are associated with poorer performance (Ames, Grube, & Moore, 1997) and that even at low-to-moderate levels of consumption (i.e., BAC of 0.04–0.10), alcohol can impair cognitive performance (Dry, Burns, Nettelbeck, Farquharson, & White, 2012; Frone, 2008). Therefore, higher levels of modal alcohol consumption could conceivably hinder job-search quality and academic performance if, following such consumption, students engage in search activity (e.g., résumé construction or job-information searching) or academic activity (e.g., completing reading or writing assignments). In fact, this phenomenon is something that ethnographic research suggests may not be so unusual (Sonnenstuhl, 2016). In particular, Sonnenstuhl (2016) found that even those students who consistently consumed alcohol when taking weekday “breaks” with friends often returned to their studies or job-search activities immediately thereafter.

Higher levels of modal alcohol consumption could also adversely affect employment prospects if modal drinking activities (e.g., going out for an evening drink) get in the way of meeting academic deadlines, or of completing time-sensitive job-search requirements (e.g., filing a job application). Put more simply, such health-related behavior may be disadvantageous for those seeking employment upon graduation, if drinking (and the potential hangover and recovery afterward) consumes valuable time that might otherwise be devoted to their studies or job search. In light of such potential effects, we posited the following.

> *Hypothesis 1*: Modal alcohol consumption (i.e., quantity/frequency) is inversely associated with the probability of full-time employment upon graduation (vs. unemployment).

Logic suggests that, for similar reasons, the frequency of HED in college could also be associated with a diminished probability of employment upon graduation. More specifically, although research suggests that HED may facilitate career-oriented relational activity in the short term (Liu, Wang, Bamberger, Shi, & Bacharach, 2015), those engaging in it more

frequently are likely to experience more frequent periods of impairment and hangover than those engaging in it less frequently. Thus, it is possible that more frequent binge drinkers potentially limit their opportunities to engage in job-search activities and adversely affect the quality of their search processes and products (e.g., résumés, cover letters).

More frequent HED could also adversely affect employment outcomes by harming students' academic performance. Studies suggest that the frequency of HED could be related to missing class, falling behind in schoolwork, poorer academic performance (Powell, Williams, & Wechsler, 2004; Thombs et al., 2009), and a heightened risk of disciplinary action (Wechsler et al., 2002). Indeed, students who binged at least three times per week were roughly six times more likely than those who drank, but never binged, to perform poorly on a test or project as a result of drinking (40% vs. 7%) and five times more likely to have missed a class (64% vs. 12%; Presley & Pimentel, 2006). Based on this reasoning, we expected the following.

> *Hypothesis 2:* Frequency of HED is inversely associated with the probability of full-time employment upon graduation (vs. unemployment).

Method

Participants and Procedures

The current study is the first publication based on data collected as part of a larger study entitled, "The College-to-Work Transition & Alcohol Misuse: An Etiologic Study." This larger study was approved by Cornell University's Office of Research Integrity and Assurance (Protocol No. 1408004876) and subsequently by the internal review boards of the other participating universities. In the context of this larger study, names and contact information for nearly 16,000 college seniors in their final quarter/semester before graduation were received from the registrars of four universities located in different parts of the United States.[1] Contacting them via email toward the beginning of their final quarter/semester and using an Internet survey method, we screened these students for graduation status and plans to begin working upon graduation; 3,450 of these individuals responded to this screening survey (a coverage rate of 21.6%, indicating sufficient sampling). Participation was proportionate to each school's representation in the graduating cohort, such that 14%, 28%, 27%, and 31% were from schools in the Pacific Northwest, Midwest, Southeast, and Northeast, respectively.

Among these 3,450 students, 1,051 indicated that they were not graduating, or were graduating, but not entering the United States labor market (e.g., continuing their studies, traveling), and thus were excluded from further participation. In contrast, 2,399 students indicated that they were graduating and planning to begin working upon graduation, thus were eligible to participate in the main study. Of these, 845 responded to our screening survey after their school-specific sample-size targets (determined by a priori power analysis for detecting small effects) in the main study had been reached. Accordingly, these students

[1]Three of these universities are public institutions, whereas the fourth is mixed public and private. Undergraduate enrollment ranged from approximately 14,500 to 32,000 students. Average composite SAT scores for entering freshmen in 2015 ranged from 1815 to 2120.

were excluded from further participation. Another 26 students refused consent when invited to participate. The remaining 1,528 students were directed to the first survey (i.e., pregraduation survey) of the study, a 15-min online survey assessing demographics, individual differences, alcohol use, and academic/vocation-related variables. Among them, 499 did not complete the instrument after repeated reminders. Thus, 1,029 completed the first survey, receiving a $15 e-gift certificate for doing so.

Those who completed the first survey were asked to complete a second survey one month after graduation, receiving an additional $25. Of the 1,008 participants (97.9% retention) completing the second survey, 960 were either employed or seeking employment (with the remainder either not graduating or graduating, but not entering the labor market; $n = 48$ excluded from the study). Because we were interested in the comparison between full-time employment and unemployment, those indicating part-time employment ($n = 133$) were excluded from the current analysis, leaving 827 full-time employed or unemployed participants.

The sample characteristics were representative of each participating university.[2] Women made up 61% of the sample (consistent with trends; Vincent-Lancrin, 2008), 69% were Caucasian, 20% were Asian, 3% were African American, and 8% were multiracial. Mean age was 22 ($SD = .76$).

Measures

Employment status upon graduation—Postgraduation employment was assessed in the second survey (1 month after graduation) on the basis of a single-item measure drawn from the Gallup Organization (Gallup, 2004). Recent graduates were asked to indicate which status "best describes your current work situation." Those selecting "employed for pay in one or more jobs for 35 hours a week or more," "self-employed working 35 hours a week or more," or "combination of self-employed and employed in one or more jobs for pay for 35 hours a week or more" were categorized as employed full-time ($n = 454$; 47% of the sample). Those selecting "not currently working for pay" or "not currently working for pay but will be working for pay in the future" were coded as unemployed ($n = 373$; 39% of the sample). Those selecting other options indicating employment in one or more jobs for a total of fewer than 35 hours a week were categorized as employed part-time and eliminated from the current study's analyses ($n = 133$; 14% of the sample).

Alcohol-use variables—Alcohol use was assessed in the first survey during the last semester/quarter in college. We used the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985; Dimeff, Baer, Kivlahan, & Marlatt, 1999) to assess participants' modal quantity and modal frequency of consumption of standard drinks (with a standard drink defined as 4 oz. wine, 10 oz. wine cooler, 12 oz. beer, a cocktail with 1 oz. of 100-proof liquor, or 1–1/4 oz. of 80-proof liquor). For modal quantity of consumption, participants were asked to "consider a typical week during the past month," and then asked to indicate how much, "on average (measured in number of drinks), do you drink on each

[2]Detailed analytic results are available upon request from the first author.

day of a typical week?" They recorded the number of such drinks separately for each day of the week using seven separate digital dials. Modal quantity of consumption was calculated as the total number of drinks consumed over the course of the week. Modal frequency of consumption was assessed (using a digital dial of 0–30 days) by asking: "On how many days did you drink alcohol during the past month?"

Single Alcohol Screening Question Instrument (SASQ)—We used the SASQ (Canagasaby & Vinson, 2005; Williams & Vinson, 2001) to assess the frequency of HED. Using the same definition of a standard drink as noted above, participants were presented with a 0–30-day digital dial and asked, "How often in the past month did you drink more than four (if you are a woman) or five (if you are a man) standard drinks in a single day?"

Control variables—We controlled for race (coded as 0 = White and 1 = minority) because of evidence that Hispanic and African American students use/misuse alcohol less than White students (Borsari, Murphy, & Barnett, 2007; Marx & Sloan, 2003) and that even college-educated minorities remain disadvantaged in many labor markets (Jones & Schmidt, 2013). In addition, we controlled for four individual characteristics that could underlie a spurious relationship between alcohol use and employment. Specifically, three of these individual differences, i.e., student-loan status (coded 1 if the student had such debt and 0 otherwise), career indecision, and financial stress, may affect job search as well as generate stress for which alcohol may be used as a basis of self-medication (Feldman, 2003; Song, Foo, Uy, & Sun, 2011; Song, Uy, Zhang, & Shi, 2009). Career indecision was assessed using Osipow's (1994; α =.84) measure, a sample item of which is "I know I will have to go to work eventually but none of the careers I know about appeal to me." We measured financial stress using a two-item, modified version of Song et al.'s (2009) measure (α = .91; sample item = "In the past month, I felt pressured by my daily expenses"). As our participants were nested within four universities and these universities may have different employment prospects for their graduates, we also created three dummy variables to represent the four sampled schools.

In our initial analyses, we also considered controlling for other demographics (i.e., age, gender), human-capital variables (i.e., academic major [coded as: quantitative/hard science major = 1, all other majors = 0] and grade-point average [GPA]), adaptability (Ployhart & Bliese, 2006; α = .87), and depression (Kroenke, Spitzer, & Williams, 2003; α = .81). We did so to demonstrate a link between student drinking behavior and employment, above and beyond these more conventional factors linked by prior research to job-search and employment outcomes. As the ability to control impulses has been linked to alcohol use (e.g., Whiteside, Lynam, Miller, & Reynolds, 2005) and is a personality trait that may impede the self-regulation of job-search behaviors (Kanfer et al., 2001), we also considered trait impulsivity (Whiteside & Lynam, 2001; α = .76). Social desirability, measured with Strahan and Gerbasi's (1972) short version of the Marlowe-Crowne Scale (α = .57) was also considered, as this variable can potentially affect self-reporting of drinking behavior (Bacharach, Bamberger, & Sonnenstuhl, 2002). Following Bernerth and Aguinis (2016), these variables (all included in Table 1) were only included in our initial analyses if they were significantly correlated with drinking variables or employment, which was only true

for age, gender, social desirability, and depression. These variables were further eliminated from our main analyses after results indicated that their effects were not statistically significant, and that their removal had no meaningful impact on the findings reported below.

Results

Means, standard deviations, and correlations among the study's variables are reported in Table 1. The mean consumption levels from the current sample are consistent with prior research (Hoeppner et al., 2012). We tested our hypotheses in a series of logistic regressions using maximum likelihood estimation in Mplus 7.11 (Muthén & Muthén, 2012). The results of these analyses, including model fit, Nagelkerke pseudo R^2, logistic regression coefficients, and odds ratios, are reported in Table 2.

In Model 1, the control variables (e.g., race, student-loan status, career indecision, financial stress, and university dummy variables) were entered. The results indicated that minorities (vs. Whites) were .66 times less likely, whereas participants with loan debt (vs. those with no debt) were 1.49 times more likely, to be employed full-time (vs. unemployed) 1 month after graduation. In addition, students with one measurement unit greater financial stress were .84 times less likely to be employed full-time (vs. unemployed) 1 month after graduation. Students at the southeastern, pacific northwestern, and midwestern universities were all more likely than the northeastern university to be employed full-time (vs. unemployed) upon graduation.

Models 2 and 3 indicated that neither modal quantity ($b = -.01$, $p = .16$) nor frequency of consumption ($b = .00$, $p = .84$) were related to full-time employment upon graduation. Thus, Hypothesis 1 was not supported. In contrast, Model 4 results indicated that HED frequency significantly predicted full-time employment status ($b = -.014$, $p < .05$, $OR = .986$), with each additional episode of heavy drinking per month corresponding to an approximate 1.4% reduction in the odds of being employed full-time (as opposed to being unemployed) 1 month after graduation. Thus, Hypothesis 2 was supported.[3] Supplemental analyses further supported Hypothesis 2.[4]

[3]We conducted additional analyses investigating the impact of the same drinking variables on part-time employment (vs. both full-time employment and unemployment). With 14% of our sample indicating part-time employment (i.e., <35 hr per week) upon graduation, our findings (available from the first author) indicate that none of the investigated drinking variables significantly predicted part-time employment relative to either full-time employment or unemployment.

[4]To rule out the possibility that pregraduation employment may be an alternative explanation for our findings, we examined the relationships among average weekly hours of pregraduation employment, our drinking variables, and employment. Although number of pregraduation work hours was significantly correlated with full-time employment, $r = .09$, $p < .01$, number of pregraduation work hours was not significantly correlated with any of the drinking variables (for modal quantity, $r = .06$, $p > .05$; for modal frequency, $r = .07$, $p > .05$; for frequency of HED, $r = .03$, $p > .05$). Nevertheless, we also conducted a sensitivity analysis to assess the degree to which our results might be affected by participants' pregraduation work hours. The inclusion of average weekly pregraduation work hours as a control variable in our models did not lead to any appreciable change in our findings or substantive conclusions. In particular, the negative association between frequency of HED and the likelihood of full-time employment upon graduation remained statistically significant. However, pregraduation work hours did significantly increase the likelihood of full-time employment after graduation ($B = .013$, $p = .02$, $OR = 1.01$). Taken together, this pattern of findings suggests that pregraduation employment is simply another predictor of the likelihood of full-time employment upon college graduation, but is not an alternative explanation for the shared variance between drinking and employment.

Discussion

Using data collected from college seniors before and just after graduation, we examined the impact of modal alcohol consumption and the frequency of HED on full-time employment upon graduation. We found no significant impact of modal consumption (i.e., how much alcohol is consumed). However, we did find a significant, inverse association between the frequency of HED (i.e., how students consume alcohol) and their odds of full-time employment. Although the estimated effect size appears to be small, it is important to note that similarly small effect sizes have been found for other employment predictors. For example, for combinations of conventional predictors of employment, such as internships and other career-preparation activities, the additional variance accounted for above and beyond control variables was 2% (Sagen et al., 2000). In addition, two previous meta-analyses showed that job-search behavior accounted for 3.2 to 4.4% of the variance in employment status without controlling for other variables ($\rho = .21$ in Kanfer et al., 2001; $\rho = .18$ in Liu, Huang, & Wang, 2014).

In particular, our data indicated that, above and beyond the effects of the various factors taken into account, each additional episode of heavy drinking was associated with a 1.4% compound reduction in the odds of being employed full-time upon graduation. Thus, for example, relative to a student who does not engage in HED, a student that reports doing so at the sample mean of 6.55 times a month (i.e., on 1 or 2 weekend days per week) has a roughly 10% lower odds of being employed full-time upon graduation. Even if a student only engages in HED on a weekly basis (i.e., four times per month), their odds of full-time employment upon graduation is roughly 6% lower than those who do not engage in HED. Given that HED was significantly associated with students' subsequent employment status, whereas modal alcohol consumption was not, our findings suggest that how students drink may be more influential in predicting employment upon graduation than how much they generally do.

Several factors may have contributed to this finding. First, for many students, modal consumption may not reach a level high enough to have adversely impacted academic performance or the ability to engage in job search. Second, any adverse effect of modal consumption on these factors may have been counterbalanced by the potentially beneficial implications of moderate consumption (relative to abstention) on both networking and job-search intensity. In terms of networking, because drinking in college tends to be highly social (Sonnenstuhl, 2016), students manifesting higher levels of modal frequency of consumption may be engaging with friends and new acquaintances more often, and thus have greater opportunities to secure new "connections" and/or valuable information on job openings. In addition, as these social gatherings can also serve as a basis for social support and encouragement (Sonnenstuhl, 2016), those reporting higher modal frequency of consumption may be better positioned to self-regulate the stress accompanying the job-search process that can often result in diminished search intensity (Liu et al., 2014). In contrast, whereas those engaging in more frequent HED may also engage in more frequent social interaction, because such interactions are more likely to be accompanied by acute intoxication (affecting social inhibition and memory), they may be of more limited value with regard to networking or learning about new job opportunities.

Although the current study's focus was strictly upon college students' drinking and their employment status upon graduation, the findings may inform future research on job-search activities and employment. First, our findings indicate that health-related behavior serves as a viable domain for those studying job-search effort and employment outcomes. Granted, uncertainty remains as to the mechanisms underlying how certain health behaviors may affect employment outcomes. Nevertheless, our overall findings suggest that further investigation into the impact of drinking and other health behaviors is warranted.

Second, noting that we focused strictly on employment outcomes for those who were mostly seeking full-time career employment for the first time, another implication is that more frequent HED has a definitive and adverse effect on individuals' ability to secure employment. This is important because previous studies focusing on the employment status of those already active in the labor market have been unable to determine whether alcohol's effect on employment stems from a heightened risk of job loss (hence, a heightened probability of unemployment) or from a more delayed return to work as a result of alcohol-impaired job search (resulting in the same outcome). Although our design did not allow us to address the job-loss issue, our findings suggest that more frequent HED has a significant adverse impact on students' probability of securing employment upon graduation.

Finally, by conceptualizing alcohol use in terms of both consumption and pattern of use, we were able to more precisely demonstrate just what it is about drinking that may affect employment status. Consistent with prior research on drinking and employee absenteeism (Bacharach et al., 2010), we demonstrated that with regard to employment, how alcohol is consumed likely matters more than how much alcohol is consumed.

Limitations and Avenues for Future Research

The contributions noted above should be considered in light of several study limitations, some of which present opportunities for further research. First, a month-long delay from graduation may have been insufficient to capture true employment status at graduation, potentially inflating the proportion of graduates that reported being unemployed. Given that nonvolitional delay in employment upon graduation can have long-term employment and earnings effects (e.g., Oreopoulos et al., 2012), future analyses should ascertain the nature of such unemployment (i.e., volitional or nonvolitional). Second, as the pregraduation survey (in which alcohol use was assessed) was administered toward the beginning of the final semester, it is possible that summer graduate responses may have captured some of their winter-break drinking. As several holidays (e.g., Christmas) may occur during this time, summer graduates may have thus reported drinking patterns that were a bit different from their typical on-campus drinking patterns. However, for participants on a quarter system, this was unlikely to be the case, as their final term started later in the year. Nevertheless, future research should replicate our findings measuring alcohol use during other times of the semester (e.g., middle, end) and potentially during junior year rather than senior year.

Third, although we concluded that more frequent HED is associated with a reduced probability of employment upon graduation, we cannot completely rule out endogeneity. This is because such patterns of drinking may be indicative of some underlying issue of behavioral disinhibition, which may also explain the difficulties in securing employment

upon graduation. Still, we do not see this as a major cause for concern in the current study, as individuals with significant problems of behavioral disinhibition are less likely to get accepted to or graduate from the kinds of institutions we studied (McLeod, Uemura, & Rohrman, 2012). Furthermore, there is evidence that, rather than serving as a manifestation of more general behavioral disinhibition, risky patterns of substance use may actually cognitively impair self-control, and thus serve as an antecedent for such behaviors more generally (Fillmore, 2012). Nevertheless, future researchers examining the alcohol–employment relationship should consider taking more general patterns of behavioral disinhibition into account.

Fourth, as noted, our sampling strategy involved setting a target sample size for each school and excluding those randomly sampled from participating if they responded after the school-specific sample size was met. In theory, such an approach could heighten the risk for sample bias if those excluded were significantly different from the rest of the population (Haziza, Chauvet, & Deville, 2010). Although we lack the data to test for such differences (i.e., no data were collected from those excluded from the study), research on response speed and sample bias in Internet surveys suggests that the risk is limited (Davern et al., 2010; Kypri, Stephenson, & Langley, 2004). Nevertheless, we encourage efforts to test the replicability of our results using other approaches to data collection.

Beyond encouraging research aimed at addressing these limitations, we also suggest that researchers further examine how both academic performance and job-search processes and products might serve as potential linking mechanisms between alcohol use and employment outcomes.[5] Similarly, research is needed to further examine how alcohol use/misuse in college may influence employment quality (e.g., income, job satisfaction, and person–job fit) among recent graduates.[6] Finally, we encourage future researchers to identify individual or situational factors that might condition the impact of alcohol misuse in college on employment outcomes.[7]

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[5]In a supplemental analysis, we tested whether academic performance (students' self-reported GPA) mediated the relationship between HED frequency and employment upon graduation. Building on Model 4, GPA was specified as a mediator between the frequency of HED and employment, with all control variables and HED frequency specified as predictors of GPA, and all control variables, HED frequency, and GPA specified as predictors of employment. We found no significant association between HED frequency and GPA ($B = .00$, $p = .41$), or between GPA and employment ($B = -.23$, $p = .24$). Moreover, the indirect effect of HED frequency on employment via GPA was not statistically significant (estimate = .00, $p = .50$).

[6]In a supplemental analysis, we tested the degree to which modal alcohol consumption and the frequency of HED might impact the quality of employment among those who were employed full-time after graduation, assessing quality in terms of participants' annual income during their first year of employment (reported 13 months after their graduation; descriptives in Table 1). In particular, we ran three separate linear regressions, one for each drinking variable, treating first-year-of-employment annual income as a continuous dependent variable. To be consistent with our main analyses predicting employment status, we controlled for financial stress, student debt, race, university, and career indecision, as well as gender and average weekly hours worked. The results of the income-related analyses indicate nonsignificant associations between all three drinking variables and employment income. Among those who reported full-time employment in the postgraduation survey ($n = 454$), 1.5% reported postgraduation annual income of under $10,000, 5.9% reported income of $10,000–$19,999, 9.5% reported income of $20,000–$29,999, 19.4% reported income of $30,000–$39,999, 12.8% reported income of $40,000–$49,999, 9.3% reported income of $50,000–$59,999, 12.6% reported income of $60,000–$69,999, 6.6% reported income of $70,000–$79,999, 2.6% reported income of $80,000–$89,999, 2.2% reported income of $90,000–$99,999, 3.7% reported income of $100,000–$149,999, and .7% reported income of $150,000 or more. Due to sample attrition, the remaining 13.2% were missing income data for their first year of employment. This income distribution of the participants employed full-time is consistent with the National Association of Colleges and Employers statistics. In addition, these income-related data indicate that the full-time employment reported one month after graduation was not simply a continuation of any low-skilled employment held by study participants during college.

[7]Although we ran several exploratory, post hoc analyses, testing whether the effects of any of the alcohol-use variables had been moderated by a number of person-related variables (e.g., gender, race, GPA), none of these tested interactions was significant. We also ran several supplemental analyses testing whether the timing of alcohol consumption influenced our results. In particular, we

Conclusion

The current study has provided some of the first evidence that health-related behavior, namely HED, has robust effects—above and beyond those of more conventional human capital and demographic factors—on young-adult employment upon graduation from college. Although the effects of individual drinking episodes on the probability of employment are small, such behavior often manifests in multiple episodes across relatively short periods of time, suggesting the need for more nuanced research on other young-adult health-related behaviors (e.g., recreational marijuana use, overuse of prescribed medication) that may have similar effects. Our findings also suggest that research on whether and how such behavior affects longer term employment outcomes is needed.

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operationalized alcohol-consumption timing in several ways. First, we operationalized it as the proportion of alcohol consumption that occurred on the weekend (i.e., using total alcohol consumption Friday through Sunday as the numerator and total weekly alcohol consumption as the denominator). Second, we operationalized it as the proportion of alcohol consumption that occurred on a day prior to a day on which classes were held (i.e., using total alcohol consumption Sunday through Thursday as the numerator and total weekly alcohol consumption as the denominator). Finally, we also operationalized it as the proportion of alcohol consumption that occurred Sunday through Wednesday, as college students may not have classes on Fridays (i.e., using total alcohol consumption Sunday through Wednesday as the numerator and total weekly alcohol consumption as the denominator). Including any one of these operationalizations in Model 4 from Table 2 as a control variable did not change our results. That is, HED frequency still significantly predicted employment (Bs = −.015 to −.020, ps < .05; ORs = .980–.986). In addition, we tested the curvilinear effects of the alcohol-use variables on employment and none of these effects were significant. These results are available from the first author upon request.

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Table 1

Means, Standard Deviations, and Bivariate Correlations Among Study Variables

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Age	22.11	.76	—																			
2. Gender	.39	.49	.12**	—																		
3. Major	.26	.44	.07	.24**	—																	
4. GPA	3.42	.38	−.09*	−.02	.08*	—																
5. Social desirability	5.18	2.04	.02	.00	.06	.04	(.57)															
6. Adaptability	3.89	.68	.01	.07	.02	−.02	.13**	(.87)														
7. Depression	.63	.69	.03	−.02	−.04	−.03	−.13**	−.20**	(.81)													
8. Race	.31	.46	−.02	−.02	.06	−.08*	.01	−.03	−.09**	—												
9. Student loan status	.46	.50	.02	−.01	−.04	−.13**	.01	−.03	.01	.04	—											
10. Career indecision	2.06	.94	−.03	−.10**	−.09**	−.02	−.07**	−.19**	.26**	.15**	.03	(.84)										
11. Impulsivity	1.89	.62	.03	−.07*	−.04	.01	−.23**	−.13**	.31**	.09	.01	.21**	(.76)									
12. Financial stress	3.03	1.24	.02	−.20**	−.13**	−.08**	.05	−.07**	.22**	−.01	.17**	.22**	.19**	(.91)								
13. Southeastern university	.27	.44	−.39**	−.05	−.02	.06	.05	.01	.03	−.17**	.02	−.03	.00	−.08**	—							
14. Pacific northwestern university	.14	.35	.15**	.05	.02	−.02	.00	.01	.00	.04	−.07**	−.02	.02	−.01	−.25**	—						
15. Midwestern university	.28	.45	.13	−.05	.01	−.04	−.07	−.03	.02	−.03	−.02	.01	−.03	.02	−.38**	−.25**	—					
16. Frequency of heavy episodic drinking	6.55	10.60	−.01	.11**	−.06	−.02	−.10**	.06	−.07*	−.14*	−.08*	−.08*	.04	−.08*	−.04	.06	.02	—				
17. Modal frequency of consumption	6.82	5.95	.08*	.18**	−.03	−.03	−.07*	.06	−.08*	−.19**	−.06	−.10**	.02	.02	−.09*	.13**	−.03	.59**	—			
18. Modal quantity of consumption	7.30	8.35	.04	.28**	−.03	−.01	−.10**	.02	−.06	−.16**	−.07	−.09*	.02	−.11**	−.08*	.06	.03	.77**	.65**	—		
19. Full time employment upon graduation	.55	.50	.00	.03	−.02	−.03	−.01	.03	−.01	−.11**	.06	−.10**	−.03	−.09**	.04	.06	.02	−.05	.01	−.02	—	
20. Postgraduation annual income	5.42	2.43	.10	.25**	.36**	.10*	−.02	.00	−.08	.03	−.17**	−.17**	−.11**	−.32**	−.18**	−.03	−.01	.07	.13*	.16	.16	—

Note. $N = 754–827$ except for correlations involving postgraduation annual income. $N = 370–401$ for postgraduation annual income correlations because only those reporting full-time employment at 13 months after graduation provided annual income responses. Gender was coded as male = 1, female = 0. Major was coded as quantitative major = 1, nonquantitative major = 0. Race was coded as minority = 1, White = 0. Student loan status was coded as student debt = 1, no student debt = 0. Southeastern university was coded 1, other universities, 0. Pacific northwestern university was coded 1, other universities, 0. Midwestern university was coded 1, other universities, 0. Thus, the Northeastern University served as the reference group. Full-time employment was coded 1 if working 35 or more hr per week, and 0 if unemployed. Those reporting employment for pay at less than 35 hr per week—i.e., part-time employment—were excluded from the analyses. GPA = grade-point average.

*$p < .05$.

** $p < .10$.

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Table 2

Estimated Coefficients of Logistic Regression With Drinking Variables as Predictors of Full-Time Employment Versus Unemployment

	Model 1			Model 2 (modal quantity)			Model 3 (modal frequency)			Model 4 (freq. heavy episodic drinking)		
Predictors	***b***	***SE***	***OR***	***b***	***SE***	***OR***	***b***	***SE***	***OR***	***b***	***SE***	***OR***
(Constant)	.17	.16		.16	.17		.16	.17		.15	.16	
Race (1 minority)	−.42**	.16	.66	−.39*	.17	.67	−.33*	.17	.72	−.47**	.16	.63
Student loan (1 loan debt)	.40**	.15	1.49	.37*	.16	1.44	.37*	.15	1.45	.38*	.15	1.46
Career indecision	−.14	.08	.87	−.16	.08	.85	−.15	.08	.86	−.15	.08	.86
Financial stress	−.17**	.06	.84	−.18**	.06	.84	−.16*	.06	.85	−.18**	.06	.84
Southeastern university	.42*	.19	1.53	.39	.20	1.48	.38	.20	1.47	.41*	.19	1.50
Pacific northwestern university	.67**	.23	1.96	.67**	.25	1.95	.62*	.24	1.87	.70**	.23	2.01
Midwestern university	.38*	.19	1.47	.42*	.20	1.51	.39*	.19	1.48	.39*	.19	1.48
Modal quantity consumption				−.01	.01	.99						
Modal frequency consumption							.00	.01	1.00			
Frequency heavy episodic drinking										−.014*	.007	.986
−2 log likelihood	1,098.84			1,011.34			1,020.42			1,094.61		
df	8			9			9			9		
Nagelkerke pseudo R^2	.05			.06			.05			.07		
Sample size	825			759			763			825		

Note. Race was coded as minority = 1, white = 0. Student loan status was coded as student debt = 1, no student debt = 0. Southeastern university was coded 1 = southeastern university, 0 = other universities. Pacific northwestern university was coded as pacific northwestern university = 1, other universities = 0. Midwestern university was coded as midwestern university = 1, other universities = 0. Thus, the Northeastern University served as the reference group. Full-time employment was coded as 1 if the individual reported to work 35 or more hr per week for pay, and 0 if unemployed. Those reporting employment for pay at less than 35 hr per week—i.e., part-time employment—were excluded from the analyses.

*$p < .05$.

**$p < .01$.