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Heavy Episodic Drinking in Early Adulthood: How Parents' Education Contextualizes the Effects of College Status

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Abstract

Young adults who transition to college are at particular risk of heavy episodic drinking (HED), as they consume more alcohol than their same-aged peers who do not attend college. Yet the link between college attendance and HED during young adulthood may vary depending on social class origins. Building on life course and socio-structural perspectives that suggest that status characteristics give meaning to role transitions in ways that shape young adults' drinking behavior, this study situates the risk of HED within the sociological context of educational attainment, and examines how parents' education conditions the relationship between young adults' college status and HED. We suggest that the odds of HED are higher when a young adult's college status is "off-diagonal"—incongruent with her/his parents' educational attainment. Using data from Waves I and III of the National Longitudinal Study of Adolescent to Adult Health for a sample of 13,526 young adults, stratified by sex, results indicate that being off-diagonal increases the odds of HED, but not for everyone. Females whose parents have higher levels of education but who themselves do not attend college, and those whose parents have low levels of education but who themselves attend four-year colleges, have higher odds of HED. The results for males show no significant interactions between parents' education and own college status. For both females and males, there are pronounced racial/ethnic differences in HED odds, after controlling for educational mismatch. Findings suggest that HED policies targeting the archetypal four-year-college attending male should be expanded to other groups.

Keywords

Alcohol; Education; Gender; Young Adulthood

BACKGROUND

Substance abuse is a leading health indicator for the Healthy People 2020 initiative (2012), and the reduction of heavy episodic drinking (HED) among adults 18 and older is a key

¹When we refer to "college status," we mean the young adult respondents in the Add Health Survey, who are the focal participants of interest. This is contrasted to "parents' education" for their parents.

focus—deemed high-priority for research and intervention efforts. HED (commonly known as “binge drinking”) is often defined as four or more drinks on an occasion for females and five or more for males, given sex differences in the processing of alcohol (Chavez et al. 2011, Wechsler and Nelson 2001). Research and debate on HED have, unsurprisingly, focused on a high-risk population: young adults. Nearly 40% of adults aged 18 to 25 reported HED in 2012 (SAMSHA 2013), and 2010 data showed a prevalence of over 28% for HED in the prior 30 days for those aged 18 to 24 (CDC 2010).

While HED poses a serious challenge for scholars and health specialists, little is known about its determinants for the non-college population. In this paper we consider the link between young adults’ college status¹ and HED, but especially how the overlap (or lack thereof) of their college status with their *parents’* education may have implications for drinking behavior at such a pivotal phase of the life course. We use Waves I and III of the National Longitudinal Study of Adolescent to Adult Health (Add Health) to answer a set of research questions, which we outline below. First we review the scholarship on HED that has examined it from a life course perspective and with a socio-structural lens focusing on how status characteristics (sex and race/ethnicity) frame role transitions in ways that are meaningful for problem drinking. We follow this with a discussion of the importance of considering social class—the congruence between parents’ education and one’s own college status—as a key status characteristic when studying HED.

HED in Life Course and Socio Structural Perspective

Drinking behavior is best examined within a life course perspective, which emphasizes that behaviors are the product of age-graded norms and expectations. As scholars point out, “alcohol use rises and falls in conjunction with the constraints, pressures, and opportunities of different life stages, roles, and contexts” (Crosnoe and Riegle-Crumb 2007:289-90:278). Young adulthood is a critical developmental period, as new roles and social environments emerge that “provide increased opportunities for successes and failures, which in turn set the stage for potential discontinuity in functioning and adjustment...” (Schulenberg et al. 1996:289-90). College is an especially notable opportunity domain during this developmental period; consequently, considerable research has explored HED among college students.

A recent review of 18 studies from 1991 to 2007 from Carter and colleagues (2010) finds that young adults attending college consume higher quantities of alcohol than their same-aged peers not attending college. The bulk of research on the prevalence of college drinking comes from the College Alcohol Study (CAS) (see Wechsler and Nelson 2008 for the latest review). The CAS shows that 44% of those attending four-year colleges engage in HED, a prevalence rate higher than more recent data from Monitoring the Future (Schulenberg et al. 2017), which reports a 2016 prevalence in HED of 32% for college students compared to 29% for their noncollege peers. Interestingly, though, while roughly half of college heavy drinkers engage in HED before college, just as many start HED *after* entering college (Weitzman, Nelson and Wechsler 2003), which demonstrates the centrality of college as a life course marker that influences drinking.

Though there is a large body of literature on college and HED, scholars have begun to take a more theoretical approach, building upon earlier studies that focused on demographic differences or individual risk factors to consider the sociological processes that predict drinking behavior. For example, Maggs, Schulenberg and associates, and Crosnoe (Crosnoe 2006, Crosnoe and Riegle-Crumb 2007, Maggs 1997, Schulenberg and Maggs 2002, Schulenberg, Bryant and O'Malley 2004) situate the link between academic status and drinking within a life course perspective. Maggs (1997) argues that drinking in the transition to secondary education is linked to normative social, health, and academic goals; however, social goals and the desire to make friends are the most important, at least in the initial transition to college. Drinking is thus instrumental, at least in the short term and absent equally attractive alternatives. Schulenberg and Maggs (Schulenberg and Maggs 2002) similarly focus on normative developmental domains and borrow from Bronfenbrenner's (1979) ecological theory to highlight academic "microsystems" (high school, college) and person-context interactions in the transition to young adulthood. They contend that this transition is especially ripe for developmental "overload" for young adults who then use alcohol to cope with heightened stress, and can also produce a developmental "mismatch" when social and academic goals compete with one another to produce risky drinking behavior.

Crosnoe's research focuses on the link between academics and drinking in adolescence and in the transition to young adulthood (Crosnoe 2006, Crosnoe and Riegle-Crumb 2007). Using data from Add Health, Crosnoe and Riegle-Crumb (2007) focus on post-high school drinking to examine the long-term influence of academic status. They find that higher academic status (taking advanced math courses) is associated with lower odds of binge drinking in high school, but higher odds of binge drinking after high school (i.e., a reduced risk short term but an increased risk long term). In part, this reversal is a function of higher-status students' greater tendency to enter a four-year college, delay marriage, and leave the parental home.

Recent scholarship also incorporates gendered and racialized expectations into theories of HED. For example, recent research examining sports and drinking (Lebreton et al. 2017) finds gendered attitudes toward heavy drinking in college; men's HED is tied to hegemonic masculinity while women's HED is tied more to the desire to fit in with peers in social settings, which could align with the social goals discussed in Maggs' (1997) research. Christie-Mizell and Peralta (2009) find sex differences in the ways that adult role transitions (employment especially) affect alcohol consumption; employment decreases the number of drinks per occasion for females, but increases drinking quantity for males, whereas marriage reduces the number of drinks per occasion for both sexes. Thus, problem drinking is the result of the confluence of a demographic status (sex) and achieved roles. In a similar vein, recent research has advanced our understanding of how status characteristics frame the college experience in ways that predict drinking behavior. In particular, Wade and Peralta (2017) argue that racial privilege helps to explain higher odds of HED among white college students compared to African Americans. Fear of police bias among African Americans is associated with lower odds of HED. Perceptions of institutionalized discrimination can thus affect risk behaviors. We return to these considerations of sex and race in the Discussion.

Parents' Education, College Status, and HED

Though the long-term implications of HED are worrying regardless of social position, they may be particularly dire for those who lack a “safety net” of family resources. Moreover, given demographic shifts in college enrollment and completion, it is crucial to consider the link between college status and HED for groups that may have heightened risk, which may include those from lower SES backgrounds. Some of the research above points to the linkage between status characteristics (sex, race) and drinking behavior. We focus here on social class origins as a crucial status characteristic that is associated not just with HED but also college status as a key domain representing adulthood. Life course scholars note that the norms for, and expected timing of, developmental transitions (such as the tasks to be accomplished in young adulthood) can vary by social class origins (Arnett et al. 2011, Schulenberg and Maggs 2002). Parents' education establishes norms for college attendance and provides socialization to the college context (Mare and Chang 2006). Yet Walpole (2003:46, *italics added*) notes that education scholars often “*control* for social class differences rather than focusing on how those differences may shape students' experiences and outcomes.” These insights suggest the importance of considering parents' education in tandem with one's own educational status; together, they shape adjustment in early adulthood in ways that may predict HED.

The chances of attending and graduating from college vary by parents' class background (as does the *type* of college attended) (Dougherty 1992, Reynolds et al. 2006). The percentage of high school students who go directly to college has increased in recent decades; by 2006, it was 63% (NCHEMS 2008). However, the overall rate obscures class differences: “fewer than 40 percent of 18-24 year olds in the lowest quartile of family income—those with the least academic resources—go to college. This compares to about 80 percent of the top quartile income earners” (Swail 2002:19). The timing of and pathway to college also vary by status origins. The less privileged are “more likely to delay entry, more likely to enter two-year as opposed to four-year schools, more likely to transfer institutions, and less likely to finish degrees than socially advantaged students” (Goyette 2008:465). Further, the less advantaged are more likely to have higher education interrupted, illustrating that status differences in “*how students attend college* represent(s) an additional layer of stratification in higher education” (Goldrick-Rab 2006:73, *italics in original*). Elman and O'Rand (2004:154) find that status origins shape college experiences and later outcomes, and conclude that “the enduring effects of social origins and ascribed statuses on educational transitions in adulthood are starkly evident.”

Because research examining the association between college and HED often draws on samples of four-year college students (e.g., the CAS), we know little about how educational origins and college status together shape drinking behavior. Parents' education is associated with their children's college status, but also (like college itself) predicts adolescent and young adult drinking behaviors. For adolescents, a “culture of affluence” (Luthar 2003) is linked to substance use. Affluent youth have easy access to alcohol and “party hard” to alleviate the “unrelenting stresses of ‘working hard’ in order to achieve excellence across multiple domains of achievement” (Luthar and Barkin 2012: 444). A MTF study finds that younger adolescents with highly educated parents have a *lower* risk of heavy drinking, but

the pattern reverses with age (Bachman et al. 2011). This “catching up” drinking pattern for college-bound students has been shown in other studies (Bachman et al. 2008, Crosnoe and Riegle-Crumb 2007), and may suggest a link between socialization to college and socialization to drinking. For example, Crosnoe and Riegle-Crumb (2007) find that elite high school academic status (taking advanced math courses) is associated with lower odds of HED during high school, but higher odds of HED afterward, even for students who do not attend college. They theorize that these students enact a script for early adulthood that includes party drinking, even when they do not attend college.

Though evidence is mixed on the relationship between measures of family SES and adolescent and young adult HED, recent studies find that high levels of parents’ education increase the odds of HED in young adulthood (Patrick et al. 2012) and are positively associated with drinking quantity and frequency (Christie-Mizell and Peralta 2009); however, these studies do not examine the intersection of parents’ education and their children’s college status, as we do here. In another recent study, Harrell and colleagues (2013) find that college students from more affluent backgrounds (parent-reported SES) report more alcohol problems (mediated by earlier age of onset). While this corroborates the “culture of affluence” argument linking achievement pressure to HED, the sample is limited to college students at one university.

For students with less educated parents, transitional overload associated with the move to college may be magnified, with potential implications for HED (Schulenberg and Maggs 2002). Research shows that “students from low SES backgrounds who attend four-year colleges and universities work more, study less, are less involved, and report lower GPAs than their high SES peers” (Walpole 2003:63). Alternately, students from these backgrounds might not see the value in partying or HED, or their “limited access to social and cultural capital may restrict social interactions” (Musick, Brand and Davis 2012:22). Ethnographic research identifies status differences in college expectations and goals, at least among women. Hamilton and Armstrong (2009) find that more privileged women view social engagement as a primary college goal. Yet less advantaged women see drinking as incompatible with college goals; as one disclosed, “Growing up to me isn’t going out and getting smashed.... I’m supposed to get drunk every weekend. I’m supposed to go to parties every weekend ...and I’m supposed to enjoy it like everyone else. But it just doesn’t appeal to me” (Hamilton and Armstrong 2009:607).

CURRENT STUDY & CONCEPTUAL MODEL

This study examines the potentially intersecting influences of young adults’ college status and parents’ education on drinking in young adulthood. Stemming from the above discussion, we ask the following research questions:

1. Is college status associated with young adults’ drinking behavior?
2. Does parents’ education moderate the effect of college status on drinking behavior in young adulthood?

The origin of our conceptual model is that college status is an established risk factor for HED in young adulthood. We thus first examine the relationship between one’s own college

status and drinking patterns. We then consider the larger question of whether parents' education unearths complexities in this basic model, i.e. the "college effect," by examining interactions between parents' education and one's own college status. The central contribution is uncovering whether parents' education conditions the association between one's own college status and drinking in adulthood.

We focus on young adults who are "off-diagonal" (whose college status differs from their parents' education) versus "on-diagonal" (those whose college status matches their parents' education). For young adults with more educated parents, the failure to meet or exceed parents' own attainments is a lapse (Mare and Chang 2006). Given the "culture of affluence" (Luthar 2003) and press toward achievement, young adults with highly educated parents who do not successfully transition to college may have higher odds of HED. At the other end of the spectrum, college students with less educated parents may lack the cultural and social capital needed to successfully navigate college, and may turn to HED as a way to fit in or manage stress.

Yet, it may be that those who are *on*-diagonal, such as college students with highly educated parents, are more likely to drink heavily, given findings that alcohol use is goal-directed, affiliational, and linked to status and attainment (Maggs 1997). Students from highly educated families may readily embrace HED as a rite of passage they were primed to expect, with the security of an economic safety net that ensures they will remain on track (Hagan 1991). Alternatively, young adults from less educated families who do not attend college may drink heavily as a way of enacting a working-class subculture (Willis 1977).

We also build on prior research in which the effects of role transitions on substance use are separately analyzed for males and females (in light of sex differences in the timing and meaning of such transitions) (Staff et al. 2010). Evidence that females currently outpace males in college enrollment and graduation (Goldin, Katz and Kuziemko 2006, Pryor et al. 2007) leads us to suspect that patterns may vary by sex. Recent data from Monitoring the Future offer a portrait of sex variability in HED as well: trends among young adult males (ages 19-22) have consistently been declining, from 45% in 1995 to 36% in 2016, whereas HED for females of the same ages rose from 28% to 34% between 1995 and 2006, but declined again to 28% in 2016 (Schulenberg et al. 2017). Despite some increases in females' HED, however, there has not been a convergence in HED or quantity of drinking by sex. Recent research using survey data from the NLSY confirms that young adult males report drinking four drinks per occasion, compared to two drinks per occasion for females (Christie-Mizell and Peralta 2009). We thus stratify our models by sex.

DATA AND METHODS

Data

Data are from Add Health, a survey of adolescents in grades 7-12 attending 134 U.S. schools in 1994-1996 (Bearman, Jones and Udry 1997). Though schools were selected with an unequal probability, systematic sampling and implicit stratification techniques ensured those selected were representative of U.S. schools. An in-home survey was conducted in 1995-1996 with a subsample of students selected from the 134 school rosters, totaling

20,745 respondents at Wave I. A second in-home survey was conducted in 1996 with adolescents who participated in the first in-home subsample (Wave II), except Wave I graduating seniors. The Wave III in-home survey was conducted in 2001-2002 with 15,170 respondents. The longitudinal design of Add Health and the data's emphasis on youthful health are advantageous for examining how parents' education and college status predict drinking in early adulthood.

The age range (18-26) of Wave III respondents corresponds most closely with the height of HED risk established in prior research. The analytic sample includes respondents who appear in both Waves I and III and have information on young adult drinking (n=15,088). The sample is limited to those with sample weights at Wave III (n=14,216) to account for nonrandom attrition across waves and probability of selection into the sample, ensuring the data remain nationally representative (Chantala and Tabor 1999). Finally, we exclude respondents under the age of 13 or over the age of 18 at Wave I (n=690)—those older at Wave I than typical high school students and those too young to have attended college for a year or longer by Wave III. The final sample includes 13,526 young adults, 53% female and 47% male (consistent with the full Wave III sample) after multiple imputation to reduce potential bias from item-missing data on predictors. In the pre-imputed sample, missing data fall into three categories: the set of parents' education measures (ranging from just six percent missing for mother's education to 30% for father's education); variables for which one to four percent of cases are missing (such as grades, religiosity, and prior drinking); and remaining variables, for which fewer than one percent (or no) observations are missing. The Stata *ice* procedure (Royston 2005) was used to create ten complete datasets; analyses use the combined estimates in Stata 13.

Table 1 shows descriptive statistics. Significant female-male mean differences are indicated in the middle column and discussed in the Results section below. To ensure no bias was introduced by the imputation and sample selection processes, we examined means for the variables in our analyses for the non-imputed sample, and for samples not restricted by age or missing survey weights. Means vary little across these sample restrictions, with the exceptions that the sample not restricted by age has lower means for other transitions (e.g., marriage and cohabitation), and the sample including cases missing survey weights (unweighted means) has approximately five percent more respondents in the Latino/a, African American, and Asian categories. Importantly, the key education measures and outcome do not vary across these alternate samples.

Measures

Dependent variable—The outcome, *drinking* in early adulthood, is a three-category measure constructed from Wave III responses to a question asking, "Think of all the times you have had a drink during the past 12 months. How many drinks did you usually have each time? A 'drink' is a glass of wine, a can of beer, a wine cooler, a shot glass of liquor, or a mixed drink." In line with prior research noting sex differences in alcohol processing (Wechsler and Nelson 2001), and endorsements to create a gendered threshold from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the Centers for Disease Control (CDC) (Chavez et al. 2011), female respondents who reported four or more drinks

each time and male respondents who reported five or more were coded “2,” indicating *HED*.² Females who typically consumed one to three drinks (and males who typically consumed one to four) were coded as “1,” for *non-heavy drinking*. Those who reported *no drinking* were coded “0.” The coding strategy replicates research indicating non-linearity in the extent of alcohol use (Chassin, Pitts and DeLucia 1999, Crosnoe, Muller and Frank 2004). We can thus identify important factors that distinguish between and among non-drinkers, non-heavy drinkers, and those who engage in HED.

College status—Binary variables indicate the respondent’s college status at Wave III, ranging from low to high. The reference group is *college dropout or less* (which includes high-school dropouts, high-school graduates, and those who attended some college but are not currently attending college and did not receive at least a two-year degree). *Two year college, current or graduate* includes respondents who were attending or received a degree from a two-year college. *Four year college, current or graduate* includes respondents currently attending a four-year college or those who received a degree from a four-year college or a more advanced degree. In results not shown, and consistent with prior research (Crosnoe and Riegle-Crumb 2007), we first employed indicators for seven education subcategories (e.g., separate categories distinguishing attendance from graduation at each type of college, plus high school drop-outs). Results using the seven indicators were substantially similar to those reported here, but led to less parsimonious models. (For more detail, please see Supplemental Appendix A.) We opted to retain the three-category approach, consistent with other Add Health studies (Paschall, Bersamin and Flewelling 2005, Timberlake et al. 2007).

Parents’ education—Wave I *parents’ education* is a combined score from respondents’ mothers and fathers ranging from 2 (both parents have less than a high-school degree) to 10 (both parents have graduate or professional degrees). We tested alternate SES measures, including parents’ education combined with parents’ occupational status (stemming from the work of Bearman and Moody (2004)), parents’ income, and parents’ occupational status alone. Supplemental analyses show that parents’ education has the more robust association with respondents’ own college status and early adult drinking, consistent with prior findings (Dubow, Boxer and Huesmann 2009) and the theoretical framework emphasizing parental socialization toward education (Wigfield and Eccles 2000) (more information is in Supplemental Appendix A).

Other demographics—The sample is stratified by *sex* (male or female at Wave III). Additional controls (from Wave I) account for demographic variation in predicting young adult HED. *Age* is a set of binary indicators of the respondent’s age at Wave I (15-16 years and 17-18 years, with 13-14 years as the referent), to capture the curvilinear relationship between age and HED reported in prior studies, and differences in the timing of progression through adolescence and early adulthood (Bingham, Shope and Tang 2005, Chassin, Pitts and Prost 2002). Given known racial and ethnic differences in drinking behaviors (Barnes, Welte and Hoffman 2002, Iwamoto et al. 2016, Schulenberg et al. 2017, Wade and Peralta

²We acknowledge, however, that endorsement of the four-versus five-drink threshold is by no means universal in the literature.

2017), race and ethnicity are included as control variables. Race/ethnicity indicators are: non-Latino/a *African American*, non-Latino/a *Asian*, and *Latino/a* (with non-Latino/a *White/other* as the referent). Since immigrant status has been shown to be protective for substance use (Greenman and Xie 2008), we control for whether the respondent is *U.S. born* (1=U.S.-born). A family structure measure indicates whether the respondent lived with *two biological parents* (1=two biological parents, 0=other family type).

Other predictors—To better isolate the influence of college status, we control for measures of other important adult roles and transitions at Wave III. Marriage and parenthood are associated with a lower likelihood of HED (O'Malley 2004, Staff et al. 2010), so analyses include binary indicators of whether the respondent was *married* or *cohabiting* (with the reference category equal to “0” for each); whether the respondent resided with his/her child(ren) (1=*resident child*); and whether the respondent was *pregnant* (or got someone pregnant) in the 12 months prior. Given research showing a negative relationship between living with parents during college and alcohol use (Crosnoe and Riegle-Crumb 2007), respondents who reported that they *lived with a parent* were coded as “1,” while other arrangements were coded as “0,” (residence with others, in a dormitory or fraternity/sorority, or alone). Less privileged young adults may have to work for pay during college, and extensive paid work is linked to youthful substance use (Staff and Uggen 2003), so we include a measure of the *number of work hours* per week.

Prior research indicates a negative relationship between high school achievement or college aspirations and current drinking which becomes positive after high school (Crosnoe and Riegle-Crumb 2007, Schulenberg et al. 1994), so we include measures of the respondent's *grades* and *college ambitions* at Wave I. *Grades* is an average of self-reported grades (on a 4-point scale) for math, English, science, and history courses. *College ambitions* come from the question, “On a scale of 1 to 5, where 1 is low and 5 is high, how much do you want to attend college?”

Other control variables include measures of the respondent's conformity and conventionality, as well as measures of self-concept (Chassin, Presson and Sherman 1989, Hirschi 1969, Jessor and Jessor 1977, Walitzer and Sher 1996). We include a measure of the extent of the respondent's self-reported *religiosity* at Wave III because highly religious people are less likely to engage in health-risk behaviors like substance use (Bock, Cochran and Beeghley 1987, Wallace et al. 2007). Respondents were asked, “To what extent are you a religious person?” (a four-item measure ranging from “0” for “not religious at all” to “3” for “very religious”). *Others* is a five-item measure (1=strongly agree and 5=strongly disagree) derived from a question at Wave III in which respondents were asked, “Do you agree or disagree that your behavior often depends on how you think other people want you to behave?” Those who do not consider long-term consequences may be at higher risk of HED (Flory et al. 2004). Wave I *impulsivity* is a five-item scale measuring agreement that: “When making decisions, you usually go with your ‘gut feeling’ without thinking too much about the consequences of each alternative” (1=strongly disagree to 5=strongly agree). Given co-morbidity between depressive symptoms and substance use (Swendsen and Merikangas 2000), Wave III *depression* is from the Center for Epidemiological Studies Depression Scale (CES-D) (Radloff 1977) which asked, “How often was each of the

following things true during the past week?” Items include being bothered by things that usually don’t bother you, feeling depressed, and feeling sad ($\alpha=.81$). *Like self* is a five-item measure (1=strongly disagree and 5=strongly agree) of the respondent’s agreement at Wave III which asked, “Do you agree or disagree that you like yourself just the way you are?”

Research indicates that family drinking history, such as a parent or grandparent with a drinking problem, predicts alcohol consumption in late adolescence and early adulthood (Christie-Mizell and Peralta 2009). Though we do not have a direct measure of parental drinking in our data, we control for whether *alcohol was easily available in the home* at the Wave I interview (1=yes, 0=no). Finally, a measure of the respondent’s Wave I *prior drinking* is from the question, “During the past 12 months, on how many days did you drink alcohol?” Responses were grouped as: 0 (never had more than a sip or two of a drink); 1 (had more than a sip or two of a drink in their lifetimes but did not drink in the prior 12 months); 2 (drank one or two days total); 3 (drank once a month or less); 4 (drank two or three days a month); 5 (drank one or two days a week); 6 (drank three to five days a week); and 7 (drank every day or almost every day).

Analytic Strategy

As the dependent variable is categorical (non-drinking in the prior 12 months=0, drinking at levels lower than HED=1, and HED=2), analyses use multinomial logistic regression models in which non-drinking serves as the comparison. Models assess, for each category of drinking, the log-odds that a respondent falls into that category (non-heavy drinking or HED) rather than the reference category (non-drinking), adjusted for covariates. Odds ratios are presented for ease of interpretation, indicating the odds of drinking (or HED) relative to not drinking. (Log-odds results and standard errors are available from the authors upon request.)

First, we examine descriptive statistics for females and males, and note significant mean differences (Table 1). We then provide multivariate results for the female subsample (Table 2a), followed by those for males (Table 2b). In each, Model 1 includes the college status indicators, parents’ education, and demographic controls. Model 2 adds interaction terms for the college status and parents’ education variables. Finally, Model 3 introduces other predictors, to determine whether observed relationships between the key predictors and drinking are potentially spurious, and robust to inclusion of the prior drinking indicator. Analyses use sampling weights to correct for the unequal probability of selection into the Add Health sample and nonrandom attrition of respondents between and across waves. Survey-correction employs design variables to account for the stratified and clustered nature of the sample and ensure standard errors are not underestimated (Chantala and Tabor 1999).

RESULTS

Descriptive Statistics

Table 1 provides means, standard deviations, and minimum/maximum values for all variables, by sex. There are marked differences in the extent of drinking between females and males, illustrated by the statistically significant mean difference in our categorical

outcome, which is higher for males ($p < .001$). Differences are more intuitive when broken down by the type of drinking. Among females, 30% indicated that when they drank they usually engaged in HED, while 47% indicated that they drank more moderately (1-3 drinks). Among males, 37% indicated that they usually engaged in HED, while 43% indicated moderate drinking.

There are significant sex differences in college status. More males than females (58% vs. 49%) fall into the lowest education category (college dropouts or less), whereas more females than males fall into either of the college groups (16% female vs. 13% male enrolled in or graduated from a 2-year college; and 34% female vs. 29% male enrolled in or graduated from a 4-year college). The parents' education means are 5.25 for females and 5.34 for males (on a 2 to 10 scale).

Table 1 shows several other significant differences. More females than males are married, cohabiting, residing with at least one child, and had a pregnancy/got someone pregnant in the prior 12 months. More males live with parents at Wave III, and males worked over five hours more per week on average than females. The mean female GPA is significantly higher, and females have significantly higher college ambitions than males. Females report higher religiosity and depression than males, yet lower impulsivity and prior drinking frequency. Finally, females have a higher mean score on the variable measuring the extent to which respondents like themselves just as they are.

Female Multivariate Results

Female multivariate results are reported in Table 2a. The results in the first three columns indicate the odds of being a non-heavy drinker (a moderate drinker) versus a nondrinker. The results in the final three columns show the odds of being a heavy episodic drinker (HED) versus a nondrinker.

Turning first to the Model 1 results for *non-heavy* drinking versus nondrinking, females who are currently enrolled in/graduates of four-year colleges have twice the odds of moderate drinking (versus non-drinking) as those in the reference category (college dropout or less), while females who are currently enrolled in/graduates of two-year colleges have 33% higher odds of moderate drinking than the referent. The coefficient for parents' education is significant at $p < .001$, with each unit increase corresponding to a 10% increase in the odds of non-heavy drinking versus nondrinking. Of the other demographic predictors, age is significantly positively associated with non-heavy drinking (versus non-drinking), and U.S.-born females have twice the odds of moderate drinking than those who are foreign-born. African Americans and Asian Americans have lower odds of non-heavy drinking than White/other respondents.

The second set of columns in Table 2a shows the female Model 1 results for the contrast between *HED* and nondrinking. The result for four-year college status is similar to but slightly lower in magnitude than in the results for non-heavy drinking. Four-year college status is associated with 58% higher odds of HED by comparison to the college dropout or less group. The positive association of parents' education with HED is comparable to that for non-heavy drinking (although significant at $p < .01$). Results for other demographic

predictors are similar to those for non-heavy drinking, except age is not associated with HED odds, and Latina respondents have significantly lower odds (by 40%) of HED than Whites.

Model 2 adds interactions between college statuses and parents' education. First, in the Model 2 comparison between *non-heavy* drinkers and nondrinkers (left columns), the two-year and four-year college interactions with parents' education are both significant and negative. In the Model 2 comparison of *HED* and nondrinkers (right columns), the coefficient for the four-year college status * parents' education interaction is negative and significant at $p < .05$, but the coefficient for two-year college status * parents' education is not significant, but the coefficient for the first-order two-year college status variable becomes significant at $p < .05$.

Model 3 of Table 2a introduces controls for other important roles and transitions and prior drinking frequency. First, for the *non-heavy* drinking/nondrinking contrast (left columns), living with parents and higher religiosity lower the odds of non-heavy drinking, while each additional hour worked per week and higher Wave I college ambitions increase the odds of non-heavy drinking. Unsurprisingly, each unit increase in prior drinking frequency increases the odds of non-heavy drinking by 30%, while alcohol in the home at Wave I increases the odds of non-heavy drinking by nearly 50%. The inclusion of these predictors does not substantially alter the magnitude or significance of the first-order four-year college and parents' education coefficients, nor the magnitude of the interactions between the college status variables and parents' education (though the two-year college status * parents' education interaction coefficient declines in significance). However, the coefficient for the first-order two-year college status measure is reduced in magnitude and statistical significance (to $p < .05$).³

In the female Model 3 results for *HED* versus nondrinking (far right column), several known predictors are associated with HED. Notable differences from the Model 3 non-heavy drinking results are: married females have lower odds of engaging in HED than those who are unmarried, depression is significantly positively associated with HED, and Wave I college ambitions are not significantly associated with HED (compared to nondrinking). Further, higher scores on the variable measuring the extent to which respondents like themselves are associated with lower odds of HED, while respondents who indicate that their behavior does not depend on how other people want them to behave have higher odds of HED. With the inclusion of these controls, the negative interaction term for four-year college status and parents' education remains significant at $p < .05$. The positive first-order four-year college status coefficient remains similar in magnitude and significant at $p < .01$, while the positive first-order two-year college status coefficient is no longer statistically significant. The positive first-order parents' education coefficient is only slightly reduced in magnitude and remains significant at $p < .01$. In short, the associations of parents' education and four-year college status with both non-heavy drinking and HED remain robust after the

³To better understand why including controls for roles and transitions only alters the magnitude and significance of the first-order two-year coefficient for moderate drinking, we note that there are significant mean differences among women across college status categories on the variables measuring key life transitions. (See Supplemental Appendix A for further information.)

inclusion of these known predictors. Moreover, the four-year * parents' education interaction remains significant in Model 3 for both sets of comparisons.

Figure 1 better illustrates the interplay between parents' education and respondents' college statuses and their associations with female drinking. This figure is based on Model 3 of Table 2a, with all variables aside from college status and parents' education held at their means, and age set at the 17-18 year-old category (the group for which HED odds are numerically lowest). Parents' education is plotted across all nine values. Figure 1 helps to clarify the heterogeneity in female HED (calculated as the relative risk of HED by comparison to both non-HED drinking and nondrinking) across parents' education, by highlighting the comparison for which there is a consistent, significant difference in drinking patterns: *female four year college attendees/graduates versus the "college dropout or less" group*. The probability of HED for females in these two groups ranges from approximately 21-27%, but illustrates opposite patterns as parents' education increases. At the lowest level of parents' education, females in the "college dropout or less" group have a lower risk of HED (just over 22%) than those in the four-year college status category (nearly 27%), but at parents' education values over 5, the *opposite* is the case. At the highest level of parents' education, those in the "college dropout or less" group have an over 26% probability of HED, while those in the four-year group are predicted to have the *lowest* probability of HED, around 21%. Looking across the highest values of parents' education (7 to 10), women in the college dropout or less group have average probabilities of HED of ~26% versus ~22% for four-year college women in the same parents' education range. On the lower end of the parents' education distribution (2 to 4), females in the college dropout or less group have an average probability of ~23%, versus 26% for four-year college females.

Thus, the "off-diagonal" groups that indicate noncongruence—females whose parents have lower levels of education but who themselves are more educated, and females with highly educated parents who themselves have lower levels of education—have higher odds of HED than differently educated peers with congruence in parental education.⁴ Figure 1 thus provides a different lens for comparing the significant interaction effects from Table 2a, and reveals substantial variability in the ways that parents' education influences drinking behavior for female young adults. The graph reveals intriguing patterns that prior research has not uncovered.

Male Multivariate Results

These female patterns are not paralleled in the results for males (see Table 2b). In the Model 1 *non-heavy* drinking results (left columns), both two-year and four-year college statuses are significantly, positively associated with non-heavy drinking (versus non-drinking), as is parents' education. The results for other variables in Model 1 are similar to the female results; however, the two older age categories are more strongly positively associated with males' non-heavy drinking than females'. The U.S.-born effect for males is in the opposite direction (negative) and is not significant, and Asian race is not significant.

⁴This raises a question regarding the relative size of the "off-diagonal" groups compared to those following a more common path: are they too "rare" to warrant study? An examination of survey-adjusted cross-tabulations (see Supplemental Appendix A, Table A1) indicates that this is not the case.

In Model 1 of the *HED* results (right columns of Table 2b), the four-year college coefficient is positive and significant. The parents' education coefficient is positive and significant (at $p < .001$), with each unit increase in parents' education corresponding to a nearly 9% increase in male odds of HED versus non-drinking. The primary difference by comparison to the female results is shown in Model 2—neither of the interactions between college statuses and parents' education is significant (for both moderate drinking and HED). College statuses and parents' education do not interact in their relationships with male drinking behaviors.

In Model 3 of Table 2b, with the inclusion of other predictors, the parents' education coefficient is reduced only minimally in its association with both non-heavy drinking and HED, and remains significant (though its significance is somewhat reduced in the HED results, to $p < .05$). For the non-heavy drinking results (left columns), the coefficient for the first-order four-year college status term remains positive and statistically significant (at $p < .01$). Yet, in the HED results (right columns), the first-order four-year college status coefficient is no longer statistically significant, indicating that the control variables explain at least in part the relationship between four-year college status and the odds of HED for males. Since the college status * parents' education interaction terms for males were not statistically significant, we refit Model 3, excluding the interaction terms (results not shown). The results yielded similar patterns of associations, and the addition of other predictors did not materially deviate from the patterns shown for the primary college status and parents' education variables.

Other notable differences across all models for males compared to females are that the Latino coefficient for male HED is not significant, cohabitation is significantly negatively associated with male (but not female) HED, and depression is not significantly associated with male HED. Further, there are interesting differences between male and female respondents with regard to the measures of self-esteem/self-concept. For males, the coefficient for the variable measuring the extent to which respondents like themselves is not statistically significant in its association with HED. Further, males who report that their behavior does not depend on how others want them to behave have higher odds of both non-heavy drinking and HED than do nondrinking males, and this relationship is significant at $p < .001$. The results underscore the need to consider determinants of drinking behavior by sex: we do not see the interplay between college status and parents' education for males, and some known predictors of drinking operate differently by sex. Moreover, the social processes captured by our control variables help to explain (at least in part) the positive association between four-year college status and the odds of HED, but only for males.

DISCUSSION

Health research on substance use has been somewhat disconnected to scholarship on attainment origins and how these origins—in particular parents' education—are related to college attendance and completion. We attempted to merge these bodies of work to examine a seemingly normative risky behavior among young adults: drinking. Social drinking and HED are common among young adults, most notably those who attend four-year colleges. The common focus on college attendees in the HED literature does little, however, to help scholars and intervention experts address the complicated origins and motivations for

drinking among young adults who do *not* attend college, and it masks important distinctions by sex and social class.

The large body of scholarship that has examined HED either as a result of purely psychosocial determinants or simply as a product of the institutional setting of college seems therefore incomplete. Research highlights the important connections between contexts, education, and HED across the life course (Crosnoe and Riegle-Crumb 2007), and our findings suggest that this line of inquiry is a fruitful one, especially as it pertains to the critical developmental period of young adulthood. Moreover, our results add insight to the growing body of research that has examined status heterogeneity in the association between college and other outcomes such as fertility, earnings, and marriage (Brand and Xie 2010, Brand and Davis 2011, Musick, Brand and Davis 2012). College has become an expected marker of adult status, but this is not necessarily the chosen, or optimal, path for everyone. The drinking behaviors we observe for young adults seem to reflect *intersecting* statuses, and suggests that social class origins shape educational transitions in ways that predict HED, building on prior research positing that status characteristics give meaning to drinking contexts in young adulthood (Wade and Peralta 2017). The high prevalence of drinking among young adults underscores the need to examine additional factors that motivate drinking among this group as they navigate their futures in the first few years after high school.

The significant interaction effect on moderate drinking and HED that we observe for females highlights the importance of mismatch between females' educational attainment and that of their parents. Specifically, females whose parents have high levels of education but do not themselves attend college are dramatically out of line with the broader social expectation that children's educational attainment will meet or exceed their parents'. The mismatch between the expectation for females from higher-attaining families and their *actual* attainment, then, has significant consequences for drinking behavior in adulthood. Yet, at the other end of the spectrum, female four-year college attendees/graduates whose parents are not highly educated have not defied the social expectation—they are fulfilling a societal ideal of doing better than one's parents—but they have a higher probability of HED than both similarly-educated four-year peers with highly educated parents, and those who follow the path of their non-college educated parents.

The non-findings on the interaction of parents' education with college status for males are also of note. As shown in Table 2b, educational contexts may not distinguish well among young adult males with respect to HED behaviors across the parental education spectrum. This is consistent with the argument that “men with disadvantaged social origins behave similarly to average men” (Musick, Brand and Davis 2012:64), at least when it comes to how educational status is associated with drinking behavior in young adulthood. There are significant, positive associations between the main four-year college status and parents' education measures and HED in baseline models—but they do not *intersect* in their influence as they do for females.

Together, our results suggest that efforts to discourage HED that focus on the archetypal, more affluent, four-year college student male may be putting the cart before the Clydesdale,

so to speak. Females are already more vulnerable to the effects of HED. While both males and females experience negative health consequences (e.g., alcohol dependence, unintentional injuries, and the risks of unplanned/unprotected sex), females have distinct consequences (which is partly why there is a sex-based measure: females have lower rates of gastric metabolism, leading to higher blood alcohol levels for a fixed amount of alcohol (Wechsler et al. 1995)). These biological differences may also partly account for greater reductions in cognitive functioning among younger females who drink heavily compared to males (Squeglia et al. 2011). Other costs borne by females include unintended pregnancy, HED during pregnancy, miscarriages, low birthweight births (Naimi et al. 2003), and a greater risk of rape (McCauley, Calhoun and Gidycz 2010).

Our findings indicate that intervention strategies need to focus more, not just on females, but especially those on the “off-diagonal,” particularly those who come from low-attaining families who are increasingly making the transition to four-year colleges. Women currently outnumber men in college attendance and four-year college graduation (Goldin, Katz and Kuziemko 2006), yet this expansion of college status for young women includes more who come “from backgrounds that had hitherto made college attendance unlikely” (Brand and Davis 2011:864), especially those whose parents did not experience it. Females who have traditionally had less access to educational attainment beyond high school are thus at the forefront of a promising educational trend, but this attainment may be jeopardized by problem drinking. Considering recent research findings that those “on the margin of college attendance” (i.e., those from disadvantaged backgrounds) actually stand to gain the most from college in terms of earnings (Brand and Xie 2010), it is especially troubling that females on the margins could be further jeopardizing their long-term gains by drinking to excess. Respondents in the sample are still in young adulthood and so they are not positioned in careers and have not reached full earning potential; however, their increased probability of HED during the college-age years shows a possible snag in that earning potential down the line.

Thus, females with limited cultural and social capital (whose parents cannot help them navigate the transition to college) already find themselves in a somewhat unique position by attending four-year colleges—they likely have more trouble finding peers from their own backgrounds and fitting in with students from more advantaged backgrounds while in college, but their college experiences mean they also have less in common with lower-achieving peers at home. On the other hand, females from highly educated families who do not themselves succeed in higher education are not living up to societal expectations. Both of these states seem to suggest that adjustment could be a key mechanism underlying the relationship between educational mismatches and females’ HED. For instance, we might expect that females from disadvantaged families who attend college and those from highly educated families who do not are at greater risk to experience depression, which influences their drinking behaviors. Yet our control for depression (while highly significant for females’ HED odds) does not attenuate the influences of college or parents’ education on HED. Similarly, control measures that tap into respondents’ self-esteem (the extent to which the respondent likes herself) and nonconformity (the extent to which the respondent’s behavior is not dependent on how others want her to behave) are directly associated with HED, but neither accounts for the pattern we observe for “mismatched” females. We

separately examined other predictors that could potentially explain the mismatch/HED relationship, (results not shown) including a Wave III measure of the extent to which respondents agreed it was important to “fit into the group you’re with,” and Wave I and III measures of the extent to which respondents were close with their parents. These measures were not directly associated with female moderate drinking or HED, and did not serve to explain the mismatch/HED relationship.

Results are also robust to the inclusion of numerous adult roles and prior conditions that may select young adults into college (or not) in the first place, which gives us some confidence that the experience of “mismatch” predicts drinking in our female sample. For example, differences in other transitions such as marriage or childbearing could select young adults “out” of college and thus increase the odds of HED. Again, our moderating predictors of own and parents’ education hold after accounting for these possible factors. It would be beneficial for future research to consider longer-term patterns to more completely examine the influence of adult transitions. Perhaps young adults are temporarily delaying some transitions due to other unobserved factors, which could later put them at increased or decreased risk of substance abuse. Timing could be an important consideration for how these transitions influence drinking behavior.

Indeed, despite our inclusion of a rich set of covariates, we are unable to pinpoint the precise mechanisms that underlie the mismatch/HED relationship for females. There are likely unobserved factors or mechanisms that influence these patterns (for instance, the data do not have measures for cognitive functioning that may influence drinking). Further, the reasons why mismatch is linked to female HED may differ themselves by class origins. For example, perhaps females with highly educated parents who do not pursue education beyond high school bear the stigma of perceived failure and drink to cope, while those with less educated parents who attend four-year colleges drink strategically, to fit in and navigate new social worlds. Our ability to examine these issues more thoroughly is constrained because it requires additional interaction terms (essentially, four-way interactions) that reduce stability in our statistical models. As such, we remain cautious in interpreting the associations shown, but note that the mismatch/HED relationship for females is in itself stable and robust to alternate specifications of the model. The challenge for future research is uncovering the social mechanism(s) at work.

Despite these issues, our study makes an important contribution to the literature, and helps motivate new scholarship. Scholars can build on our study in a number of ways. We sought to understand the relationship between respondents’ educational statuses and HED by examining their interplay with parents’ education, in analyses disaggregated by sex. Our disparate findings for males and females suggest the importance of gendered pathways to educational attainment. Other recent research on HED has sought to understand how drinking is a way of “doing gender,” or enacting gendered social roles (Peralta et al. 2010, Young et al. 2005), and has provided valuable, if mixed, evidence indicating that gender roles are linked to college students’ HED. We were unable to examine gender roles with our data, but our findings may provide an avenue for harmonizing the mixed results of these studies. The enactment of gendered social roles is likely shaped by other, intersecting characteristics, such as social class and race/ethnicity (Simpson and Elis 1995). Scholars

have noted that alcohol use as a strategic, goal-directed behavior linked to status and attainment (Maggs 1997), yet, there are also class-based differences in college females' views of alcohol use as something that facilitates (rather than hinders) attainment (Hamilton and Armstrong 2009). Moreover, there are marked status differences in the traits parents value and the strategies they deem appropriate for goal attainment (Kohn 1977, Lareau 2003). Future research might profitably combine our findings with those on gender roles to ascertain how educational status origins (and race/ethnicity) shape gender roles and attainment norms in ways that predict HED for those who make (or fail to make) successful educational transitions. Gender roles may well mediate *and* moderate the influence of college status and/or social class origins on drinking behavior in young adulthood.

Our findings on race/ethnic differences also open the door for further scholarship. While we included race/ethnicity as simple control variables, the results show pronounced differences in drinking by race and ethnicity, net of the interaction between parents' education and college status, raising the potential for considering how social class origins and ethno-racial status work together to predict HED. Relative to white young adults, male and female African Americans have lower odds of moderate drinking and HED, male and female Asians have significantly lower odds of HED, and Latinas have lower odds of HED. These results are consistent with prior research reporting lower levels of drinking among minorities compared to whites (Peralta and Steele 2009, Schulenberg et al. 2017, Wade and Peralta 2017). A fruitful line of inquiry would be to determine whether these reduced odds of HED for minorities are linked to expectations. For example, we situate our analyses within a framework of *educational* expectations stemming from status origins (parents' education), but research has also shown that *racialized* expectations can determine drinking behaviors as well. Peralta and Steele (2009) link African American drinking behavior (in particular, abstinence) in college to perceptions of being criticized for heavy drinking. Similarly, Wade and Peralta (2017) find that college students are less likely to engage in HED if they fear race-based police bias. Minority students may feel that the institution of policing, much like higher education, is a hostile "white space" (Peralta 2005:128), thus leading to greater abstinence. Also, considering the link between heavy drinking and violence (Collins and Schlenger 1988, Roudsari, Leahy and Walters 2009), and the racialized expectation that minorities are more violent and likely to be criminals (Welch 2007, Young 2006), it is certainly plausible that traditionally marginalized groups (African Americans in particular) would make an effort to counter these stereotypes by drinking less. It is beyond the scope of this paper, but would be worthwhile (given available data) to examine whether racialized expectations interact with educational expectations to predict HED. The convergence of racialized *and* attainment expectations might be an especially harmful backdrop for problem drinking behaviors.

The lower odds of HED among Asians is also consistent with prior literature, though the intersection of educational and racialized expectations for this group may play out differently. Expectations of Asians as the "model minority," despite the harm of this stereotype and acknowledged variation among Asians in higher education (Ng, Lee and Pak 2007) may also be related to lower HED levels. Recent scholarship has shown that HED among Asian Americans is still lower than for whites, yet there are important differences by generational status: while first-generation Asian American students have lower levels than

whites, second-generation Asian Americans have statistically similar levels of HED as whites (Iwamoto et al. 2016). Thus, even within this traditionally low-risk ethnic group, there are still high-risk subgroups. The Iwamoto and colleagues (2016) study is important, but it looked at only men at one university. Future research still needs to examine whether racialized and educational expectations might be interacting to influence HED among different ethnic groups, and whether these risks pertain to females as well as males, using a more representative sample that includes non-college students.

Similar endeavors should be undertaken that focus on Latina/os. Our findings reveal lower HED odds, but only for females. Importantly, this finding is net of a control for U.S.-born status (which is large in magnitude across HED models for both males and females, and remains highly significant for females even after additional controls are introduced in the third model). Research on the immigrant paradox might be especially useful for this subgroup (as well as Asians) to situate the risk of problem drinking within cultural expectations. In particular, research finds similar generational contingencies in the risk for HED among Latino youths: third-generation Latinos have greater risk of problematic drinking than first-generation Latinos, which is partly explained by reduced family closeness and association with substance-using peers (Bacio, Mays and Lau 2013). Thus, cultural norms and values such as *familismo* may be relevant for some ethno-racial patterns of HED. Acculturation patterns and the erosion of tradition seem to be important. Bacio and colleagues' (2013) study examined adolescents and not adults, however. Whether acculturation represents an important risk factor—or immigrant enclaves represent a buffer against—HED among college students (or those who forgo college altogether) is still an open question. These considerations underscore the importance of collecting data on subgroups across multiple generations, as well as perceptions of expectations (and institutional stereotypes) linked to ethnoracial status. The intersection of these statuses may have important implications for drinking and other harmful health behaviors, even for groups that might appear to have low risk.

Finally, in addition to college status, the confluence of other adult roles should be highlighted, especially given recent work that demonstrates “the substantial influence of social class background in how emerging adulthood is experienced” (Arnett et al. 2011:48). In particular, if educational attainment origins have a complicated association with college status, as we find here, then we might expect these origins to condition the influence of other adult transitions on drinking behaviors as well. Additionally, an examination of post-college years or the later 20s and 30s may be important; college attendance is more proximate to the *adolescent* social origins we have examined, whereas adult transitions to marriage, parenthood, and labor force involvement may be more closely related to *adult* occupational or earnings attainment, which are largely dependent upon college. Thus, a host of possible transitions likely affect adult drinking, and these associations may vary by attainment origins, but should be considered within a longer longitudinal framework of adulthood to tease out the transition markers (and their sequencing) that are likely to matter. Though we control for the effects of adult transitions here, an examination of the possible complex association between these transitions and attainment origins on drinking is beyond the scope of one paper. These and other considerations will greatly advance knowledge about the processes that lead to risky drinking behavior in adulthood. HED has serious consequences

for later development, and uncovering whether there are additional forms of heterogeneity in the processes that increase its risk remains a necessary challenge.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.
Predicted Probability of Heavy Episodic Drinking, by Parents' Education and Respondent's College Status: Female Sample

Table 1

Survey-Corrected Descriptive Statistics for Variables in the Drinking Analyses

Variables in the Analyses	Females		Males		Min	Max
	Mean	Std. Dev.	Mean	Std. Dev.		
<i>Dependent Variable: Drinking, Wave III</i>	1.07	.75	1.16	.71	0	2
HED	.30	—	.37	—		
Non-HED drinking	.47	—	.43	—		
No drinking (referent)	.23	—	.20	—		
<i>College Status Wave III</i>						
College dropout or less (referent)	.49	—	.58	—	0	1
Two-year college, current or graduate	.16	—	.13	—	0	1
Four-year college, current or graduate	.34	—	.29	—	0	1
<i>Parents' Education & Other Demographics</i>						
Parents' Education Wave I	5.25	2.22	5.34	2.10	2	10
Age 15–16	.35	—	.35	—	0	1
Age 17–18	.30	—	.33	—	0	1
African American	.16	—	.15	—	0	1
Asian	.03	—	.04	—	0	1
Latina/o	.11	—	.12	—	0	1
U.S. Born	.94	—	.94	—	0	1
Two biological parents Wave I	.55	—	.57	—	0	1
<i>Other Predictors</i>						
Married Wave III	.21	—	.13	—	0	1
Cohabiting Wave III	.18	—	.15	—	0	1
Resident child Wave III	.30	—	.12	—	0	1
Pregnancy prior 12 months Wave III	.06	—	.04	—	0	1
Lives with parents Wave III	.36	—	.44	—	0	1
Work hours/week Wave III	23.27	19.07	28.91	20.19	0	90
Grades Wave I	2.91	.78	2.70	.75	1	4
College ambitions Wave I	4.50	1.01	4.33	1.08	1	5
Religiosity Wave III	1.43	.95	1.28	.89	0	3

Variables in the Analyses	Females			Males		
	Mean	Std. Dev.		Mean	Std. Dev.	
						Max
Impulsivity Wave I	2.88	1.13	***	3.09	1.09	1 5
Depression Wave III	.07	.78	***	-.11	.62	-2.12 3.61
Drinking frequency Wave I	1.61	1.81	**	1.74	1.85	0 7
Alcohol in home Wave I	.30	—		.30	—	0 1
Like self Wave III	3.97	.93	***	4.20	.78	1 5
Others Wave III	3.66	.98		3.62	.93	1 5

 $p < .001$;

**
 $p < .01$;

*
 $p < .05$

Table 2a
Odds Ratios for Survey-Corrected Multinomial Logit Models of Wave III Drinking: Females^a

Independent Variables	Drinking (Non-Heavy) vs. No Drinking			HED vs. No Drinking		
	1	2	3	1	2	3
<i>College Status Wave III</i>						
Two-year college, current or graduate	1.334 *	2.716 **	2.250 *	1.218	2.246 *	1.866
Four-year college, current or graduate	2.000 ***	3.702 ***	3.511 ***	1.575 ***	3.404 ***	3.421 ***
<i>Parents' Education & Other Demographics</i>						
Parents' Education Wave I	1.101 ***	1.176 ***	1.155 ***	1.087 **	1.171 ***	1.139 **
Age 15–16	1.568 ***	1.568 ***	1.311 *	1.017	1.017	.854
Age 17–18	1.590 ***	1.589 ***	1.202	.838	.837	.665 **
African American	.332 ***	.328 ***	.394 ***	.154 ***	.152 ***	.176 ***
Asian	.564 **	.564 **	.569 **	.376 **	.375 **	.357 **
Latina	.760	.766	.829	.600 *	.607 *	.629 *
U.S. Born	2.083 ***	2.100 ***	1.689 **	2.740 ***	2.754 ***	2.036 ***
Two biological parents Wave I	.899	.902	.981	.981	.988	1.131
<i>Other Predictors</i>						
Married Wave III	—	—	.867	—	—	.476 ***
Cohabiting Wave III	—	—	1.104	—	—	.879
Resident child Wave III	—	—	.885	—	—	.789
Pregnancy prior 12 months Wave III	—	—	.936	—	—	.807
Lives with parents Wave III	—	—	.816 *	—	—	.745 *
Work hours/week Wave III	—	—	1.009 ***	—	—	1.012 ***
Grades Wave I	—	—	1.040	—	—	.998
College ambitions Wave I	—	—	1.083 *	—	—	1.071
Religiosity Wave III	—	—	.851 **	—	—	.723 ***
Impulsivity Wave I	—	—	.952	—	—	1.043
Depression Wave III	—	—	1.066	—	—	1.269 **
Drinking frequency Wave I	—	—	1.279 ***	—	—	1.361 ***
Alcohol in home Wave I	—	—	1.498 ***	—	—	1.562 ***
Like self Wave III	—	—	.902	—	—	.794 ***

Independent Variables	Drinking (Non-Heavy) vs. No Drinking			HED vs. No Drinking		
	1	2	3	1	2	3
Others Wave III	–	–	1.054	–	–	1.124 *
<i>Interactions of College & Parents' Education</i>						
Two-year college * Parents' Education	–	.858 *	.886	–	.874	.901
Four-year college * Parents' Education	–	.886 *	.890 *	–	.863 *	.865 *
Intercept	.520 *	.391 **	.393	.447 *	.324 **	.527 **

 $p < .001$,

**
 $p < .01$,

*
 $p < .05$ (two-tailed).

^aFemale $N = 7,165$

Table 2b
Odds Ratios for Survey-Corrected Multinomial Logit Models of Wave III Drinking: Males^a

Independent Variables	Drinking (Non-HED) vs. No Drinking			HED vs. No Drinking		
	1	2	3	1	2	3
<i>College Status Wave III</i>						
Two-year college, current or graduate	1.511 **	1.365	1.408	1.362	1.363	1.430
Four-year college, current or graduate	1.603 ***	3.037 **	2.807 **	1.533 **	2.557 *	2.801 *
<i>Parents' Education & Other Demographics</i>						
Parents' Education Wave I	1.140 ***	1.174 ***	1.148 ***	1.108 ***	1.137 **	1.097 **
Age 15–16	2.067 ***	2.067 ***	1.726 ***	1.209	1.209	.987
Age 17–18	2.188 ***	2.188 ***	1.598 **	1.174	1.171	.838
African American	.576 ***	.574 ***	.684 **	.177 ***	.177 ***	.215 ***
Asian	.808	.801	.866	.437 **	.434 **	.474 **
Latino	.888	.904	.919	.734	.745	.757
U.S. Born	.886	.887	.766	1.575 *	1.578 *	1.303
Two biological parents Wave I	1.042	1.050	1.164	1.038	1.044	1.196
<i>Other Predictors</i>						
Married Wave III	—	—	.906	—	—	.528 **
Cohabiting Wave III	—	—	.961	—	—	.618 *
Resident child Wave III	—	—	1.225	—	—	1.339
Pregnancy prior 12 months Wave III	—	—	1.528	—	—	1.501
Lives with parents Wave III	—	—	.716 **	—	—	.750 *
Work hours/week Wave III	—	—	1.002	—	—	1.004
Grades Wave I	—	—	1.075	—	—	1.004
College ambitions Wave I	—	—	1.127 **	—	—	1.161 **
Religiosity Wave III	—	—	.849 *	—	—	.756 ***
Impulsivity Wave I	—	—	.989	—	—	1.065
Depression Wave III	—	—	1.192	—	—	1.166
Drinking frequency Wave I	—	—	1.217 ***	—	—	1.322 ***
Alcohol in home Wave I	—	—	1.557 ***	—	—	1.629 ***
Like self Wave III	—	—	.941	—	—	.911

Independent Variables	Drinking (Non-HED) vs. No Drinking			HED vs. No Drinking		
	1	2	3	1	2	3
Others Wave III	–	–	1.184 ***	–	–	1.242 ***
<i>Interactions of College & Parents' Education</i>						
Two-year college * Parents' Education	–	1.014	1.009	–	.997	.996
Four-year college * Parents' Education	–	.897	.899	–	.916	.927
Intercept	.680	.595	.290 *	.727	.650	.281 *

*** $p < .001$,

** $p < .01$,

* $p < .05$ (two-tailed).

^a Male $N = 6,361$