First- and Continuing-Generation Students, Substance Use, and College Graduation

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Graduation from a four-year college is an important potential means of social mobility for those from lower socioeconomic backgrounds. For "first-generation" students, the path to a degree is often made more difficult by circumstances such as working long hours and living with parents, as well as an unfamiliar college environment. One concerning aspect of college life is the continuing prevalence of substance use, which has hampered graduation rates and led many universities to reconsider the impact that the party subculture has on student well-being. In this paper, we use data from The National Longitudinal Study of Adolescent to Adult Health to examine differences in substance use (binge drinking, marijuana use, other illicit drug use) and four-year college graduation across unique combinations of students defined by college generation, work, and residential statuses. Consistent with previous qualitative studies into the class-specific consequences of the college party subculture, substance use is generally found to be higher among continuing-generation students who are not working nor living with their parents. In addition, substance use appears to have little consequence for the graduation prospects of these most traditional continuing-generation students. In contrast, substance use is negatively associated with graduation for most other groups, particularly first-generation students or those working long hours.

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Introduction

A college degree is of increasing importance in the United States, and a near minimum requirement for admission into the middle class (National Center for Education Statistics [NCES] 2017). As such, college enrollment rates have continued to rise, in part fueled by first-generation students. As of 2012, over one-third of undergraduate students were the first in their families to attend college (NCES 2014). First-generation students face many challenges during their post-secondary tenure, such as transitioning in and out of full-time student status (Zinshteyn 2016), working full-time (Balemian and Feng 2013), non-traditional living arrangements (Pascarella et al. 2004), and family responsibilities (Wilbur and Roscigno 2016). To a certain extent, these challenges stem from the fact that first-generation students tend to come from families with fewer financial resources, leaving them with little support to combat the rising costs of college (Cho et al. 2008). Yet, the difficulties of first-generation students extend beyond economic resources, to limited social and cultural capital, which may interfere with integration and engagement in college (Beattie 2018; Lee and Kramer 2013; Mullen 2011).

One potential challenge to the completion of a four-year degree, for all students, is an increase in substance use on campuses (Johnston et al. 2016). Annual prevalence rates for any illicit drug use have increased from 34 percent of students in 2006 to 41 percent in 2015. Marijuana use prevalence increased from 30 percent to 38 percent over this same time period. Although binge drinking has decreased in recent years, rates remain high at 32 percent of students (Johnston et al. 2016), and is seen by many students as a rite of passage (National Institute of Health 2015). Previous research finds alcohol, marijuana, and other drug use to undermine grades, class preparation, attendance, and graduation (An, Loes, and Trolian 2017; Arria et al. 2015; Martinez et al. 2009; Pascarella et al. 2007). Moreover, highly visible and tragic cases of alcohol and sexual abuse at fraternities and sororities have led many universities to reconsider the impact of the party culture on student well-being (Haag 2017; Hartocollis and Friessnov 2017; Hauser 2017).

Recent qualitative research suggests that substance use may be particularly detrimental for disadvantaged groups such as first-generation students. For example, in *Paying for the Party*, Armstrong and Hamilton (2013) observed that the consequences of the campus party subculture were particularly damaging to women of lower socioeconomic backgrounds, knocking them off track in their efforts toward social mobility. In contrast, for students from more advantaged backgrounds, the party subculture had few detrimental consequences, and may have facilitated social connections, romantic relationships, and employment opportunities. Sweeney's (2014) qualitative study of a Midwest "party school" also emphasizes class differences in the consequences of partying, with men from disadvantaged backgrounds more hesitant to engage in the party subculture as it may jeopardize their studies and prospects of upward mobility. The present study examines whether one aspect of the party subculture—substance use—

varies in its consequences across socioeconomic groups within a nationally representative sample.

This paper uses data from the National Longitudinal Study of Adolescent to Adult Health to examine predictors of substance use in college (i.e., binge drinking, marijuana use, and other illicit drug use) and its consequences for subsequent graduation with a four-year degree. Moreover, it examines differences in relationships between substance use and graduation across first-generation and continuing-generation students, as well as the role of other circumstances increasingly common, such as long work hours and living with parents while in school.

Review of Literature

Substance Use among College Students

From a life course perspective, it is not surprising that substance use increases as adolescents make the transition to college. The transition to adulthood is marked by major transitions, identity exploration, increasing independence from parental monitoring, and risk-taking (Crosnoe, Kendig, and Benner 2017). Arnett (2005) describes this stage as "emerging adulthood," during which youth transition into new roles, gain independence, and often engage in high levels of substance use.

Increases in substance use, however, may vary across types of substance, and for different social groups. For example, previous research has found alcohol use to increase in college, but not marijuana use (White et al. 2006). With respect to group differences, Crosnoe and colleagues (2017) observed trajectories of the highest alcohol use among students attending four-year colleges. Crosnoe and Riegle-Crumb (2007) also found, paradoxically, that advanced coursework in high school was negatively associated with binge drinking in high school, but positively associated with drinking in one's early 20 s. Other research has found young adults from higher socioeconomic backgrounds more likely to use alcohol and illegal substances (Humensky 2010; Patrick et al. 2012). The greater use among advantaged groups may reflect having adequate resources to fund substance use, and the belief that social standing protects against potentially negative consequences.

Class Differences in the Consequences of Substance Use

That social standing may protect against the consequences of substance use is suggested by previous studies. John Hagan's classic study, "Destiny and Drift", examined two competing subcultures in adolescence and their consequences for status attainments. The "delinquent" subculture was characterized by preferences for more serious transgressions such as stealing, vandalism, fighting, and running from the police. The "party" subculture, in contrast, involved going to parties, dating, cruising, and alcohol use (Hagan 1991). The consequences of these subcultures were class-specific. Among boys from working-class

backgrounds (defined by parent's occupational characteristics), the delinquent subculture was associated with lower occupational prestige in adulthood, whereas it had no effect for their more advantaged counterparts. In contrast, the party subculture was found to be associated with *increases* in occupational prestige for boys from more advantaged circumstances, yet had no consequences for the working class. Hagan attributed the negative consequences of delinquency for working-class boys to a labeling process that set youth adrift into adulthood. He argued delinquency did not hurt boys from advantaged backgrounds due to their socioeconomic resources and "second chances" that kept them on track to reproduce their parents' advantages. The benefits of the party subculture for advantaged youth was explained in terms of the acquisition of social capital, upon which boys from working-class backgrounds were unable to capitalize (Hagan 1991). Neither the delinquency nor party subculture were predictive of occupational prestige for girls of either social class.

That party subcultures have class-specific consequences among college students is suggested by recent qualitative studies. Armstrong and Hamilton (2013) studied 47 women living in a dorm at a mid-level state university. They described several pathways through college—party, mobility, and professional—composed of different configurations of academic, social, and romantic activities, and which had varying consequences for college success and future socioeconomic attainments. In particular, they found that for middle and upper middle-class women (defined by parent educational and occupational attainment), the party subculture was a means for achieving their vision of the "college experience," and often coupled with easier majors led to graduation. The party subculture did not provide the same enjoyment for women of lower-middle and working-class backgrounds, and in some cases derailed their social mobility efforts (Armstrong and Hamilton 2013). Sweeney (2014) observed a somewhat similar pattern among 24 men at a state university. More advantaged men (i.e., whites and those of higher family socioeconomic status) often saw partying as simply a part of the college experience, a way of "having fun" and "letting loose" (p. 811–12). In contrast, men from disadvantaged backgrounds tended to view partying more warily, saying they were not in college "to be stupid" or "do things you might regret" (p. 813).

Life Course Role Configurations and First-Generation Students

The present study seeks to build on prior qualitative research by examining substance use among college students, and the degree to which the relationship between substance use and subsequent graduation is class-specific, within a nationally representative sample. To examine differences in substance use and graduation among college students, we draw upon Macmillan and Eliason's (2003) conceptualization of the life course in terms of role configurations, contexts, and pathways. Role configurations are combinations of roles across domains (i.e., work, family, and education) at a given stage in the life course. Contexts refer to sources of stratification that shape role configurations and

their relationships to life course pathways. Finally, pathways refer to patterns of role configurations over time.

Beginning with contexts of stratification, researchers' approaches to conceptualizing social class among college students vary widely. Some have emphasized single dimensions of family income or parental education (Pascarella et al. 2004; Weiss and Roska 2016), or occupations (Hagan 1991). Others have considered the double disadvantage of being low income and first-generation (Engle and Tinto 2008), whereas still others have examined multiple dimensions simultaneously (Armstrong and Hamilton 2013; Goldrick-Rab 2006; Walpole 2003), or the intersectionality of racial minority status and other dimensions of socioeconomic status (Jack 2016; Sweeney 2014). Finally, some have considered subjective dimensions of social class (Soria, Stebleton, and Huesman 2013).

As we are seeking to examine college graduation, and our study is motivated by issues of intergenerational mobility, we focus on parental education and the distinction between first-generation and continuing-generation students. Students whose parents are not college graduates—often called "first-generation students"—face significant challenges in their pursuit of higher education. This disadvantage starts well before college in early educational disadvantages (Balemian and Feng 2013), continues through the college search, application, and admissions process (Toutkoushian, Stollberg, and Slaton 2015), and into college itself in the form of lower rates of graduation (Lareau 2011; Pascarella et al. 2004).

With respect to role configurations, two factors that may distinguish the college experiences of first-generation students are a greater likelihood to work significant hours and to live off campus with parents (Mullen 2011; South and Wei 2015; Wilbur and Roscignor 2016). A recent report from the Center for Education and the Workforce (Carnevale, Smith, Melton, and Price 2015) notes that most students work during college, and that many work long hours. For example, about 40 percent of undergraduates work 30 or more hours a week, and 25 percent work full-time. Though work connected to one's area of study is beneficial, long works hours is detrimental to college success, particularly for disadvantaged students (Carnevale et al. 2015). Among first-generation students, long work hours were found to undermine academic internal locus of control and critical thinking (Pascarella et al. 2004). Other research has found working to be associated with anxiety (Mounsey, Vandehey, and Diekhoff 2013) and binge drinking (Miller, Danner, and Staten 2008). Butler, Dodge, and Faurote (2010) similarly found work hours to be positively associated with number of drinks consumed.

With regard to living arrangements, living with parents may interfere with autonomy (Kins and Beyers 2010) and integration into the role of a college student. Using data from the Educational Longitudinal Study, Wilbur and Roscigno (2016) found living with parents (and work hours) to be negatively associated with college completion. Bozick (2007) similarly found the combination of long work hours and living at home to predict leaving college during the first year. However, several studies have found living with parents to be protective against substance use (Cacciola and Nevid 2014; Simons-Morton et al.

2016; Wechsler and Nelson 2008; White et al. 2006). Living with parents is also a form of parental support that promotes affordability (Newman 2012; Swartz et al. 2011; Swartz, McLaughlin and Mortimer 2017).

Summary of Study and Hypotheses

Combining role configurations and socioeconomic contexts, we will identify unique configurations defined by generation (first-generation versus continuing-generation), work (long hours versus not), and residential statuses (living with parents versus not). We will then examine the degree to which substance use during college varies across these groups. Finally, we will examine odds of four-year college graduation, and the degree to which the relationship between substance use and graduation varies across the groups.

Reflecting the greater risk-taking of emerging adulthood, particularly among more advantaged youth (Crosnoe et al. 2017), we hypothesize that substance use will be higher among continuing-generation than first-generation students. Consistent with previous research, it is expected that living with parents will be associated with lower levels of substance use, both because of the greater potential for monitoring by parents as well as less opportunity for exposure to the party subculture on campus. Although long work hours has been found to be associated with drinking, it is not clear that exposure to substances through the workplace would be greater than that experienced within the party subculture. We do not have strong a priori reasons for expecting the relationships between living with parents or working and substance use to vary by generational status.

We expect first-generation status, living with parents, and long work hours to each be negatively associated with subsequent four-year college graduation. Thus, we expect respondents in the first-generation, living with parents, and working role configuration to have the lowest odds of graduation, and those in the continuing-generation, not living with parents, and not working configuration to be most likely to complete college. We expect intermediary role positions (e.g., continuing-generation, but living with parents and working) to have graduation rates somewhere in between these extremes. With respect to differential associations of substance use with graduation, we draw on previous qualitative studies (Armstrong and Hamilton 2013; Hamilton 2016; Sweeney 2014) to hypothesize that substance use will be most detrimental to first-generation students, and less so for continuing-generation students.

Finally, the concept of pathways draws attention to continuities between adolescence and young adulthood, and the potential for selection effects. For example, the decision to work extensively while a student may reflect the uncertainties of some students with past academic difficulties who may be hedging their bets. Substance use in college may also represent a continuation of prior use, or be related to other individual characteristics. Although we are unable to fully account for these issues, and thus caution against causal interpretations, we will take advantage of the rich longitudinal data to control for a wide range of concepts potentially associated with both substance use and college success.

Data and Measures

Data

Data come from The National Longitudinal Study of Adolescent to Adult Health (Add Health), a study of adolescents in school (grades 7–12) in the United States in 1994–95, followed longitudinally across four waves. From an in-school survey of 90,118 respondents, 20,745 were randomly selected for in-home interviews and longitudinal study (Wave I). Of these respondents, 14,738 (71 percent) were re-interviewed one year later (Wave II). Follow-up interviews for Wave III and Wave IV consisted of 15,197 (73 percent) and 15,701 (76 percent) respondents, respectively, of participants from Wave I.

We restrict our sample to respondents participating at Waves I, III, and IV (n = 13,034). Wave I includes information on substance use and academic performance during adolescence, as well as parents' educational and socioeconomic characteristics. Wave III (ages 18–26) provides information on college enrollment and substance use, while Wave IV assesses educational attainments which are largely completed for respondents at this point (ages 25–32 years). We further restrict to those attending postsecondary institutions who had not completed a four-year degree by Wave III. Finally, eliminating a small number of respondents without valid sample weights, yields an analytic sample of 3,644. To address the small amount of missing data (i.e., less than 1 percent on individual covariates), we use multiple imputation across thirty imputations via "PROC MI" in SAS 9.4.

Substance Use and Graduation

We include three measures of substance use from Wave III. *Binge drinking* is based on respondent's answers to questions regarding the number of days in the past two weeks that they had: 4 or more drinks (for women) or 5 or more drinks (for men). These gender-specific thresholds are consistent with NIAAA (2004) guidelines and research on college student drinking (Wechsler et al. 1995; White and Hingson 2013). As the vast majority of the damage from alcohol among college students is accounted for by those consuming around the binge drinking cutoffs (Wechsler and Nelson 2008; Weitzman and Nelson 2004) we employ a binary measure of any binge drinking (1 = any, 0 = none). However, as the greatest risk to individuals is experienced by those drinking most frequently, we also use a count measure capturing the full variation of binge drinking in the past two weeks, from 0 to 14 days.

Respondents' *marijuana use* is a dichotomous indicator of any marijuana use over the last 12 months (1 = any, 0 = none). *Illicit drug use* consists of a dichotomous measure indicating respondents' use of any of the following over the past 12 months: cocaine; crystal meth; other types of illegal drugs such as LSD, PCP, ecstasy, heroin or mushrooms, or inhalants (1 = any, 0 = none). Additionally, we include measures of binge drinking, marijuana use, and other illicit drug use from Wave I to account for stable differences in substance use across

respondents. Measures of marijuana and other illicit drug use at Wave I are operationalized similarly to those at Wave III. Although a gender-specific measure of binge drinking is not available at Wave I, we do include an indicator of consuming 5 or more drinks during the past 12 months.

Four-year college graduation is assessed at Wave IV, at which point most respondents will have completed their educational attainments. Those who report completing at least a four-year degree are coded as (1), while lower educational attainments are coded as (0). We exclude those who had already graduated at Wave III.

Life Course Role Configurations

We create a series of life course role configuration measures at Wave III related to educational generation, work status, and residency. First, we categorize respondents as either *first-generation* or *continuing-generation* students. First-generation is defined as those for whom neither parent completed a four-year degree. This is a common (Martinez et al. 2009; Toutkoushian et al. 2015) and fairly broad definition that includes students whose parents may have completed a two-year degree or had some experiences in higher education. Thus, we also explore a narrower definition of first-generation that only included students whose parents had no educational attainment beyond a high school degree (see sensitivity analysis section).

Within these groups, we distinguish students who reported *working* 30 or more hours a week from those *not working* 30 hours a week. This cutoff is sometimes used to denote full time work, and is consistent with concerns raised by Carnevale and colleagues (2015). As other studies have used a lower cutoff (Dundes and Marx 2006), we also explore a cutoff of 20 or more hours of work (see sensitivity analysis section). Finally, we distinguish students who reported *living with their parents* at Wave III from those who were *not living with their parents*. This is based on a single question about whom respondents were currently living with most of the time. This information on educational generation, work status, and residency is combined to yield eight life course role configurations.

Additional Covariates

Additional controls (gathered from Wave I unless otherwise specified) include sex (*male* = 1, female = 0), *age* at Wave III, and five mutually-exclusive indicators of race and ethnicity, including: non-Hispanic *white* (the reference category), *black, Asian, other race*, and those of *Hispanic* origin. We include a dichotomous indicator for respondents *living with both of their biological parents* in adolescence, and a continuous measure of *parents' occupation* based on the respondent's report (see Ford, Bearman, and Moody 1999). Using data from the Add Health Contextual Database, *neighborhood disadvantage* is constructed as the average of four census tract measures, including proportions of: adults unemployed; families below poverty; households receiving public

assistance; and households headed by a single mother (Cronbach's $\alpha = 0.93$). An indicator variable also denotes parent reports of welfare receipt (*parents received welfare)*.

We use a variety of measures to partly account for potential selection issues. *Grade point average* is the average of respondents' self-reported grades in history, math, and science courses. Respondents' score on the Add Health Picture Vocabulary Test (*AHPVT*) is based on a 78-item abridged version of the Peabody Picture Vocabulary Test-revised, which is standardized and centered around 100. A measure of thoughtfully reflective decision making (*TRDM*) is based on four Likert-scale questions asking adolescents how often they use various approaches to solving problems (e.g., get as many facts as possible; think of as many different ways to approach the problem; use a systematic method for judging and comparing alternatives; and analyze what went right and what went wrong) (see Paternoster, Pogarsky, and Zimmerman 2011). The items are summed to create a scale, with higher values indicating higher TRDM (Cronbach's $\alpha = 0.74$). Two measures for whether a respondent *wants to go to college* or *expects to go to college* are based on responses to the following questions: how much do you want to go to college; and how much do you expect to go to college? Responses ranged from 1 (low) to 5 (high). Respondents who reported a 4 or a 5 to each question are coded as 1, while all other responses are coded as 0.

Several additional Wave III measures are also constructed. Based on indicators from the Center for Epidemiological Studies Depression Scale (CES-D) (see Radloff 1977), *depression* is the sum of nine items assessing the frequency (from 0 for never or rarely to 3 for most of the time) of depressive symptoms (e.g., bothered by things; depressed; could not shake the blues) during the past seven days (Cronbach's $\alpha = 0.82$). Dichotomous measures indicating a respondent is either *single* (the reference category), *married*, or *cohabiting* during college are included. An indicator for those having resident *children* is also included. We control for whether the respondent was a *full-time student* (versus part-time), receiving any *financial support from parents*, or had st*udent loans*.

Institutional characteristics come from the Add Health Postsecondary Contextual Component, which links the institutions respondents were attending at Wave III with the Integrated Postsecondary Education Data System (IPEDS). Institutional selectivity ranges from 1 to 20 based on the median SAT score of incoming students. A score of 1 signifies a ranking in the top 5 percent in the U. S. in terms of academic selectivity, whereas a score of 20 indicates the bottom 5 percent, or least selective institutions. We use this information to create four mutually-exclusive selectivity indicators: *Two-year or open-enrollment institutions* (the reference category) that cannot be ranked in terms of academic selectivity; *inclusive 4-year institutions* (ranked in the bottom 25 percent); *moderately selective 4-year institutions* (ranked in the middle 50 percent); and *highly selective 4-year institutions* (ranked in the top 25 percent).

We also include indicators for respondents attending a *public institution* (the reference category), a *private, for-profit institution*, or a *private, non-profit institution*. Four categories of institution size are created based on the incoming

cohort size of full-time, first-time degree seeking undergraduates, including: *1,000 or fewer students* (the reference category); between *1,001 and 3,000 students*; between *3,001 and 5,000 students*; and *more than 5,000 students*. We control for the *percentage of students receiving federal grant aid* with a measure ranging from 1 to 10, where 1 indicates the 0-10 percent decile and 10 indicates the 91-100 percent decile. Finally, an indicator for *institutions providing on-campus housing* is included.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics (means and proportions) for key variables, by college generation and role configuration groups. As we are primarily comparing the life course role configuration groups to students who are continuing-generation, not working, and not living with their parents, Table 1 also denotes statistically significant differences between this group and all other configurations. Broadly speaking, first-generation students were more likely to be working extensively. For example, 42.8 percent of first-generation students were working 30 or more hours a week while in school, compared to 29.2 percent of continuing-generation students. The generational groups did not vary much with regard to living with parents (48.2 percent of first-generation compared to 44.4 percent of continuing-generation students), though first-generation students not living with their parents were more likely to report being married or having a resident child.

Continuing-generation students of each role configuration generally reported a higher prevalence of substance use than their first-generation counterparts. For example, continuing-generation students not working and not living with parents were most likely to binge drink (50 percent) compared to 36 percent of comparable first-generation students. Binge drinking was lowest for first-generation students who were living with their parents and not working (29 percent).

Of institutional characteristics, first- and continuing-generation students differed primarily in terms of institutional selectivity. For example, only 4 percent of first-generation students who were working and living with their parents attended highly selective schools, compared to 23 percent of the comparison group. Differences by type and size of school were not as pronounced, though first-generation students were slightly more likely to attend public and smaller institutions.

Figure 1 presents group differences in rates of four-year college graduation. Jumping out most clearly is that continuing-generation students who were not working and not living with parents were the most likely to graduate (83 percent), whereas first-generation students who were working and living with parents were the least likely (only 20 percent). Within both generational groups, working long hours was associated with lower graduation rates, as was living with parents.

Table 1. Descriptive Statistics by Life Course Role Configurations

Variable	First-Generation				Continuing-Generation				Total
	Working		Not Working		Working		Not Working		
	Living With Parent	Not Living With Parent	Living With Parent	Not Living With Parent	Living With Parent	Not Living With Parent	Living With Parent	Not Living With Parent	
College Graduation	0.20 *	0.38 *	0.46 *	0.63 *	0.49 *	0.45 *	0.64 *	0.83	0.57
Demographics									
Male	0.44	0.47	0.38 *	0.35 *	0.61 *	0.50	0.46	0.48	0.45
Age	20.68	22.05 *	20.34	20.97 *	20.64	21.47 *	20.23 *	20.58	20.76
White	0.59 *	0.67 *	0.61 *	0.71 *	0.76	0.81	0.72	0.79	0.71
Black	0.12	0.14	0.12	0.18 *	0.11	0.11	0.11	0.10	0.12
Hispanic	0.23 *	0.16 *	0.19 *	0.07	0.07	0.05	0.07	0.05	0.10
Asian	0.04	0.02	0.05	0.03	0.05	0.01 *	0.07	0.06	0.05
Other Race	0.02	0.00	0.03 *	0.01	0.01	0.02	0.01	0.01	0.01
Wave I Controls									
Lived with Both Parents	0.70	0.48 *	0.68 *	0.52 *	0.71	0.64 *	0.75	0.77	0.68
Parents' Occupation	2.67 *	2.76 *	2.66	2.91 *	4.14	4.28	4.19	4.30	3.56
Neighborhood Disadvantage	8.45 *	8.74 *	8.54 *	8.52 *	6.48	6.80	6.17	6.30	7.37
Parents Received Welfare	0.05 *	0.10 *	0.08 *	0.06 *	0.01	0.02	0.01	0.01	0.04
Binge Drinking	0.12	0.32 *	0.12	0.17	0.16	0.26 *	0.10	0.16	0.16
Marijuana Use	0.15	0.30 *	0.12	0.17	0.21	0.30 *	0.13	0.14	0.17

(*Continued*)

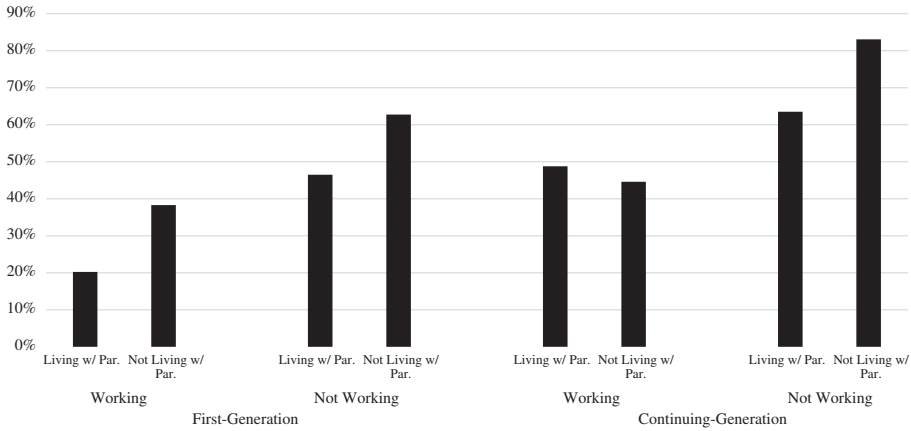
Table 1. ***continued***

Variable	First-Generation				Continuing-Generation				
	Working		Not Working		Working		Not Working		
	Living With Parent	Not Living With Parent	Living With Parent	Not Living With Parent	Living With Parent	Not Living With Parent	Living With Parent	Not Living With Parent	Total
Illicit Drug use	0.03	0.12 *	0.04	0.05	0.11 *	0.06	0.04	0.04	0.05
Grade Point Average	2.79 *	2.92 *	3.01 *	3.18 *	3.02 *	2.97 *	3.13 *	3.36	3.10
AHPVT[1]	101.32 *	103.24 *	101.15 *	104.22 *	107.52	107.44	106.32 *	109.24	105.47
TRDM[2]	8.89	8.78	8.96	8.78	9.08	9.03	8.97	9.05	8.95
Wants to go to College	0.88 *	0.89 *	0.93	0.93	0.96	0.96	0.96	0.95	0.94
Expects to go to College	0.78 *	0.81 *	0.85 *	0.86 *	0.95	0.92	0.94	0.95	0.89
Wave III Controls									
Binge Drinking	0.37 *	0.35 *	0.29 *	0.36 *	0.46	0.42	0.34 *	0.50	0.39
Marijuana Use	0.31 *	0.34 *	0.28 *	0.35 *	0.46	0.42	0.35 *	0.44	0.37
Illicit Drug use	0.11	0.08 *	0.09 *	0.14	0.23	0.20	0.13	0.17	0.14
Depression	4.35	4.11	4.49	4.28	4.21	4.02	4.04	4.11	4.19
Single	0.96 *	0.58 *	0.97 *	0.74 *	0.96 *	0.73 *	0.98 *	0.89	0.86
Married	0.02	0.18 *	0.01	0.13 *	0.02 *	0.15 *	0.01 *	0.05	0.06
Cohabiting	0.02	0.24 *	0.02	0.13 *	0.02	0.13 *	0.01 *	0.06	0.07
Children	0.06	0.21 *	0.04	0.18 *	0.04	0.12	0.02	0.06	0.09
Full-time Student	0.56 *	0.48 *	0.85 *	0.87 *	0.71 *	0.63 *	0.87 *	0.95	0.79

Parent Financial Support	0.85	0.71 *	0.88	0.82 *	0.88	0.80 *	0.91	0.91	0.86
Student Loans	0.30 *	0.44	0.41	0.64 *	0.31 *	0.37	0.34 *	0.43	0.42
Institutional Characteristics									
Selectivity									
Two-year or Open-Enrollment	0.74 *	0.71 *	0.68 *	0.44 *	0.61 *	0.54 *	0.52 *	0.34	0.54
Inclusive 4-year	0.09	0.11	0.08	0.09	0.08	0.08	0.08	0.10	0.09
Moderately Selective 4-year	0.13 *	0.12 *	0.19 *	0.31	0.18 *	0.26	0.26 *	0.33	0.24
Highly Selective 4-year	0.04 *	0.07 *	0.05 *	0.16 *	0.13 *	0.12 *	0.13 *	0.23	0.13
Type									
Public	0.87 *	0.82 *	0.83 *	0.73	0.86 *	0.79	0.79 *	0.74	0.79
Private, For-Profit	0.03	0.06	0.05	0.08	0.06	0.04	0.04	0.05	0.05
Private, Non-Profit	0.11 *	0.13 *	0.12 *	0.19	0.08 *	0.17	0.17 *	0.22	0.16
Cohort Size									
≤ 1,000 Students	0.59 *	0.70 *	0.56 *	0.47	0.53 *	0.54 *	0.57 *	0.38	0.52
1,001 to 3,000 Students	0.39	0.25 *	0.33	0.32	0.34	0.39	0.32	0.40	0.35
3,001 to 5,000 Students	0.03 *	0.04 *	0.08 *	0.14	0.08 *	0.07 *	0.07 *	0.16	0.09
> 5,000 Students	0.00 *	0.00 *	0.02 *	0.07	0.05	0.01 *	0.04	0.07	0.04
Other Institutional Characteristics									
% Receiving Federal Grant	3.90 *	3.97 *	3.96 *	3.74 *	3.46	3.62	3.68	3.29	3.67
Offers On-Campus Housing	0.37 *	0.36 *	0.44 *	0.68 *	0.54 *	0.55 *	0.58 *	0.79	0.58
Sample Size	345	346	432	490	299	294	602	836	3,644

*Significantly different from respondents who are continuing-generation, not working, and not living with their parents at the $p < .05$ level.
[1]Add Health Picture Vocabulary Test Scores
[2]Thoughtfully Reflective Decision-Making

Figure 1. Graduation rates by college generation and life course role configurations.



Multivariable Analyses

Substance Use During College

The descriptive statistics are generally supportive of our hypotheses regarding higher substance use among continuing-generation students. However, these patterns may be a function of other differences across the groups such as the institutional characteristics just noted. Thus, Table 2 presents the results of multivariable logistic regression models predicting substance use while controlling for a wide range of variables potentially associated with role configurations and substance use.

Column 1 presents the results for binge drinking. Interpretation will focus primarily on the odds ratios associated with the life course role configurations, with continuing-generation students, not working, and not living at home as the reference category. Note first that 4 of the 7 role configuration indicators are statistically significant, and all odds ratios are less than one, indicating that the reference category was among those most likely to binge drink. To better illustrate this pattern, an exploratory model (not presented) that uses this group as the sole indicator (and referencing all other configurations) revealed an odds ratio of 1.61, indicating that continuing-generation students who were not working nor living with parents had a 61 percent higher odds of binge drinking than all other groups. Also notable is the protective role of living with parents, as all of the statistically significant role configurations included living with parents. The least likely to binge drink were first-generation students who were living with their parents and not working, who had a 57 percent lower odds of binge drinking than the reference group.

Although not our primary focus, males, whites, and those from neighborhoods of lower disadvantage were more likely to report binge drinking. Also note that respondents who were married or had a resident child, statuses more common among first-generation students not living with parents, were less likely to binge drink. Of the selection-related variables, persons with lower grade point

Table 2. Logistic Models of Substance Use Regressed on Life Course Role Configurations and Other Covariates (Odds Ratios)

Variable			Binge drinking		Marijuana use		Illicit drug use	
			Exp(b)	95% CI	Exp(b)	95% CI	Exp(b)	95% CI
First-generation	Working	Living w/par.	0.64**	0.46, 0.89	0.67 *	0.49, 0.92	0.75	0.48, 1.17
		Not living w/par.	0.77	0.54, 1.09	0.88	0.63, 1.23	0.55 *	0.33, 0.92
	Not working	Living w/par.	0.43 ***	0.32, 0.58	0.63 **	0.47, 0.84	0.67	0.44, 1.01
		Not living w/par.	0.81	0.62, 1.07	1.02	0.78, 1.33	1.17	0.83, 1.66
Continuing-Generation	Working	Living w/par.	0.71 *	0.51, 0.97	0.87	0.64, 1.19	1.31	0.90, 1.89
		Not living w/par.	0.75	0.53, 1.04	0.83	0.61, 1.15	1.39	0.93, 2.06
	Not working	Living w/par.	0.50 ***	0.39, 0.64	0.65 **	0.51, 0.84	0.76	0.54, 1.06
		Not living w/par. (Ref.)	—	—	—	—	—	—
Wave I controls								
Male			2.16 ***	1.84, 2.52	1.71 ***	1.47, 2.00	1.53 ***	1.25, 1.89
Age			0.93 *	0.88, 0.98	0.91 **	0.86, 0.96	0.99	0.92, 1.06
Black[1]			0.21 ***	0.15, 0.29	0.68 *	0.50, 0.91	0.17 ***	0.08, 0.32
Hispanic			0.46 ***	0.35, 0.61	0.63 **	0.48, 0.83	0.83	0.56, 1.21
Asian			0.31 ***	0.21, 0.45	0.36 ***	0.24, 0.54	0.47 **	0.27, 0.82
Other race			0.87	0.46, 1.65	0.46 *	0.22, 0.96	0.60	0.21, 1.73
Lived with both parents			1.19	1.00, 1.41	1.11	0.94, 1.32	0.91	0.72, 1.14
Parents' occupation			1.01	0.95, 1.08	1.09 **	1.03, 1.16	1.11 *	1.01, 1.21
Neighborhood disadvantage			0.98 *	0.96, 1.00	0.99	0.97, 1.00	0.98	0.96, 1.01

(*Continued*)

Table 2. ***continued***

Variable	Binge drinking		Marijuana use		Illicit drug use	
	Exp(b)	95% CI	Exp(b)	95% CI	Exp(b)	95% CI
Parents received welfare	1.07	0.66, 1.75	0.91	0.55, 1.52	0.96	0.44, 2.10
Grade point average	0.78 ***	0.69, 0.88	0.86 *	0.77, 0.98	0.97	0.83, 1.15
AHPVT[2]	1.00	0.99, 1.00	1.01 **	1.00, 1.02	1.01 **	1.00, 1.02
TRDM[3]	1.02	0.99, 1.05	1.03	0.99, 1.06	0.97	0.93, 1.02
Wants to go to college	1.04	0.72, 1.50	0.95	0.66, 1.36	1.27	0.75, 2.14
Expects to go to college	1.17	0.87, 1.57	1.41 *	1.05, 1.91	1.12	0.74, 1.72
Wave III controls						
Depression	1.03 *	1.00, 1.05	1.03 **	1.01, 1.05	1.08 ***	1.05, 1.11
Married[1]	0.26 ***	0.17, 0.39	0.55 **	0.38, 0.81	0.66	0.36, 1.21
Cohabiting	0.80	0.59, 1.10	1.13	0.83, 1.54	1.37	0.92, 2.05
Children	0.53 **	0.36, 0.77	0.48 ***	0.34, 0.69	0.28 **	0.14, 0.55
Full-time student	0.90	0.72, 1.11	1.04	0.84, 1.29	1.09	0.82, 1.47
Financial support from parents	1.67 ***	1.32, 2.11	1.33 *	1.06, 1.67	1.14	0.84, 1.54
Student loans	1.11	0.94, 1.31	0.93	0.79, 1.10	1.04	0.84, 1.31
Institutional selectivity						
Inclusive 4-year[1]	1.17	0.84, 1.63	1.38 *	1.00, 1.91	1.02	0.65, 1.59
Moderately selective 4-year	1.12	0.83, 1.49	1.25	0.95, 1.65	0.92	0.63, 1.35
Highly selective 4-year	1.17	0.82, 1.68	1.13	0.79, 1.61	1.06	0.66, 1.71

Institutional type						
Private, for-profit institution[1]	1.57	0.90, 2.73	1.50	0.88, 2.55	1.62	0.77, 3.40
Private, non-profit institution	1.16	0.87, 1.55	1.00	0.74, 1.34	0.67	0.42, 1.05
Institutional cohort size						
1,001 to 3,000 students[1]	1.56 ***	1.25, 1.95	1.51 **	1.22, 1.86	1.44 *	1.04, 1.98
3,001 to 5,000 students	1.86 **	1.30, 2.67	1.83 **	1.27, 2.62	1.33	0.80, 2.20
> 5,000 students	1.82 *	1.13, 2.93	1.10	0.67, 1.79	1.28	0.70, 2.35
Other institutional characteristics						
% Receiving federal grant	0.97	0.90, 1.04	0.99	0.92, 1.07	0.97	0.88, 1.07
Offers on-campus housing	0.69 *	0.51, 0.93	0.56 ***	0.41, 0.75	0.73	0.48, 1.10
Past substance use (wave I)						
Binge drinking	3.01 ***	2.41, 3.76				
Marijuana use			3.36 ***	2.71, 4.17		
Illicit drug use					1.41	0.93, 2.14
Model χ^2	712.20 ***		544.16 ***		305.56 ***	

* $p < .05$, ** $p < .01$, *** $p < .001$, N: 3,644.

[1]Reference categories include white, single, two-year or open enrollment institutions, public institutions, and cohort sizes of 1000 students or less.

[2]Add health picture vocabulary test scores.

[3]Thoughtfully reflective decision-making.

Table 3. Logistic Model of Four-Year College Graduation Regressed on Life Course Role Configurations, Substance Use, and Other Covariates (Odds Ratios)

Generation and role configurations			Four-year college graduation	
			exp(b)	95% CI
First-generation	Working	Living with parent	0.11***	0.07, 0.16
		Not living with parent	0.39***	0.27, 0.57
	Not working	Living with parent	0.29***	0.21, 0.41
		Not living with parent	0.44***	0.32, 0.61
Continuing-generation	Working	Living with parent	0.37***	0.26, 0.53
		Not living with parent	0.30***	0.21, 0.44
	Not working	Living with parent	0.47***	0.35, 0.64
		Not living with parent (Ref.)	—	—
Wave III substance use				
Binge drinking			0.90	0.73, 1.10
Marijuana use			0.92	0.74, 1.14
Illicit drug use			0.56***	0.42, 0.74
Wave I controls				
Male			0.77**	0.64, 0.93
Age			1.06	0.99, 1.13
Black[1]			1.06	0.77, 1.46
Hispanic			1.66**	1.20, 2.28
Asian			1.57*	1.01, 2.45
Other race			0.43*	0.21, 0.85
Lived with both parents			1.14	0.94, 1.38
Parents' occupation			1.06	0.99, 1.14
Neighborhood disadvantage			0.97**	0.95, 0.99
Parents received welfare			0.98	0.59, 1.64
Grade point average			2.17***	1.88, 2.50
AHPVT[2]			1.01	1.00, 1.01
TRDM[3]			1.03	0.99, 1.06
Wants to go to college			1.19	0.78, 1.81
Expects to go to college			1.03	0.74, 1.43
Binge drinking			1.25	0.95, 1.65
Marijuana use			1.12	0.84, 1.49
Illicit drug use			1.06	0.69, 1.62

(*Continued*)

Table 3. ***continued***

Generation and role configurations	Four-year college graduation	
	exp(b)	95% CI
Wave III controls		
Depression	0.96**	0.93, 0.98
Married[1]	0.73	0.50, 1.08
Cohabiting	0.62**	0.43, 0.88
Children	0.45***	0.32, 0.65
Full-time student	4.15**	3.24, 5.32
Parent financial support	0.72**	0.56, 0.92
Student loans	1.34**	1.11, 1.63
Institutional selectivity		
Inclusive 4-year[1]	3.02***	2.17, 4.22
Moderately selective 4-year	3.26***	2.40, 4.45
Highly selective 4-year	3.48***	2.27, 5.35
Institutional type		
Private, for-profit[1]	1.09	0.64, 1.86
Private, non-profit	2.19***	1.53, 3.13
Institutional cohort size		
1,001 to 3,000 students[1]	1.05	0.82, 1.35
3,001 to 5,000 students	1.79**	1.18, 2.73
> 5,000 students	1.86	0.94, 3.67
Other institutional characteristics		
% Receiving federal grant	1.03	0.95, 1.11
Offers on-campus housing	1.03	0.76, 1.39
Model χ^2	1667.43***	

* $p < .05$, ** $p < .01$, *** $p < .001$, N: 3,644.
[1]Reference categories include white, single, two-year or open enrollment institutions, public institutions, and cohort sizes of 1000 students or less.
[2]Add health picture vocabulary test scores.
[3]Thoughtfully reflective decision-making.

averages or who reported depression had higher odds of binge drinking. Also note that students reporting any financial assistance from their parents had 67 percent higher odds of binge drinking than those not receiving assistance.

Interestingly, institutional selectivity was generally not associated with binge drinking, or with marijuana or other illicit drug use (one exception is the positive association between attending an inclusive, four-year institution and marijuana use). Institutional type was also not significantly associated with binge drinking

or marijuana use. This likely reflects the widespread nature of party cultures across campuses. In contrast, attending larger institutions was significantly associated with greater substance use, particularly binge drinking and marijuana use.

A fairly similar pattern of relationships is observed for marijuana use in Column 2. Three of the four role configurations involving living with parents were statistically significant, again suggesting a protective role against marijuana use. The least likely to report marijuana use were first-generation students who were not working and living with their parents, with 37 percent lower odds of marijuana use than the reference group. Men, whites, those who were single, those without a resident child, and those from more advantaged family backgrounds were more likely to report marijuana use.

The third column of Table 2 presents the logistic model of other illicit drug use. Of the life course role configurations, only one is statistically significant, with first-generation students who were working and not living with their parents the least likely to have used other illicit drugs. Men, whites and Hispanics, those without a resident child, and those whose parents had a higher occupational status were more likely to report other illicit drug use.

Life Course Role Configurations, Substance Use, and Graduation

We turn next to the question of whether life course role configurations and substance use are associated with college graduation (see Table 3). Consistent with our hypothesis, the significance of the coefficients associated with all role configurations indicates that all groups had a lower odds of graduation than the reference group. Least likely to graduate were first-generation students who were living with their parents and working long hours, with an 89 percent lower odds of graduation than the reference group. They were followed closely by their non-working counterparts, who had a 71 percent lower odds of graduation than the reference group. Note also that working long hours and living with parents were negatively associated with graduation among continuing generation students.

Of the substance use variables from Wave III, only other illicit drugs were associated with a significantly lower odds (by 44 percent) of graduation compared to those not using such drugs. Although the odds ratios for binge drinking and marijuana use were of similar magnitudes and in the expected direction, they did not reach statistical significance. Several individual and institutional variables deserve highlighting given their relationship to our focal variables. Perhaps most notable is that full-time students and those attending four-year institutions had considerably higher odds of graduating. For example, full-time students had a 315 percent higher odds of graduating with a four-year degree than did part-time students. Similarly, those attending four-year colleges, regardless of selectivity, had more than three times the odds of graduating than did those in two-year or open-enrollment four-year institutions. Also note that those who were cohabiting, had a resident child, or receiving any financial aid from

their parents had a lower odds of graduating, whereas those with student loans had higher odds.

Differential Consequences of Substance Use for Graduation

Table 4 presents the models assessing our focal question regarding the degree to which the associations between substance use and college graduation vary across the role configuration groups. This is done with coefficients representing interactions between each life course group and each substance use indicator. Given the number of interactions tested simultaneously, we adjust the critical values from the conventional alpha of 0.05 following the sequential rejection rules of the Bonferroni-Holm approach (Holm 1979), so as to guard against type I errors stemming from multiple hypothesis tests. Odds ratios that lose statistical significance following this procedure are indicated with a cross symbol in the table. Although not displayed, models include all controls from the model in Table 3.

Column 1 assesses the role of binge drinking. First note that the odds ratio reflecting the main effect of binge drinking (which can be interpreted as the unique association for the excluded group) is statistically significant and *positively* associated with graduation. Specifically, reporting any binge drinking in the past two weeks increased the odds of graduation for the most traditional students by 48 percent, compared to their non-binge drinking counterparts. In contrast, the odds ratios for the interaction terms representing the difference in the association for each of the first-generation groups were all below one and statistically significant, indicating that any binge drinking was more detrimental to the graduation prospects of these groups (though note one coefficient falls below significance after the Bonferroni-Holm adjustment). Within the continuing-generation students, only the interaction term for those working long hours and living with parents was statistically significant, although this was deemed non-significant following the Bonferroni-Holm adjustment. To aid interpretation of these interactions, Figure 2 displays changes in the odds of graduation associated with binge drinking for each group relative to non-binge drinkers in the reference group. Overall, the figure suggests that avoidance of binge drinking was particularly important for first-generation students.

Turning next to marijuana use (see Column 2), the odds ratio for the main effect is positive but not statistically significant, indicating that marijuana use was not associated with graduation for the reference category. Five of the 7 interaction terms were statistically significant and had odds ratios less than one, suggesting that marijuana use was associated with a lower odds of graduation for these groups (though two interactions lose statistical significance after the Bonferroni-Holm adjustment). To aid interpretation again, Figure 3 visually presents changes in the odds of graduation for each of the groups. Perhaps most notable here is that marijuana use appears to have most strongly undermined the graduation prospects of those not living with parents but working long hours, regardless of generation status.

Finally, in Column 3 we assess differences in the associations of other illicit drug use with graduation across the groups. The odds ratio for the main effect

Table 4. Logistic Models of Graduation with Interactions of Life Course Role Configurations and Substance Use (Odds Ratios)

			Graduation		Graduation		Graduation	
			Exp(b)	95% CI	Exp(b)	95% CI	Exp(b)	95% CI
First-generation	Working	Living w/par.	0.17 ***	0.11, 0.26	0.20 ***	0.13, 0.30	0.15 ***	0.10, 0.21
		Not living w/par.	0.57 **	0.38, 0.85	0.64 *	0.43, 0.98	0.49 ***	0.35, 0.70
	Not working	Living w/par.	0.49 ***	0.34, 0.70	0.42 ***	0.29, 0.60	0.34 ***	0.25, 0.46
		Not living w/par.	0.64 *	0.44, 0.92	0.55 **	0.38, 0.79	0.47 ***	0.34, 0.64
Continuing-generation	Working	Living w/par.	0.54 **	0.35, 0.83	0.51 **	0.33, 0.78	0.45 ***	0.31, 0.64
		Not living w/par.	0.31 ***	0.19, 0.48	0.54 **	0.34, 0.85	0.41 ***	0.28, 0.60
	Not working	Living w/par.	0.57 **	0.41, 0.80	0.62 **	0.44, 0.87	0.57 **	0.42, 0.76
		Not living w/par. (ref.)	—	—	—	—	—	—
Wave III substance use								
Binge drinking			1.48 *	1.00, 2.18				
Marijuana use					1.44	0.99, 2.10		
Illicit drug use							1.04	0.64, 1.70

			Binge drinking		Marijuana use		Illicit drug use	
Configuration by substance use interactions								
First-generation	Working	Living w/par.	0.36 **	0.18, 0.74	0.16 ***	0.08, 0.36	0.03 **	0.00, 0.26
		Not living w/par.	0.46 *†	0.24, 0.87	0.36 **	0.19, 0.69	0.19 **	0.06, 0.63
	Not working	Living w/par.	0.27 ***	0.15, 0.50	0.51 *†	0.29, 0.90	0.76	0.33, 1.79
		Not living w/par.	0.43 **	0.25, 0.76	0.69	0.39, 1.21	0.87	0.41, 1.85
Continuing-generation	Working	Living w/par.	0.45 *†	0.23, 0.86	0.48 *†	0.25, 0.91	0.43 *†	0.20, 0.96
		Not living w/par.	0.92	0.46, 1.81	0.26 ***	0.13, 0.51	0.29 **	0.13, 0.68
	Not working	Living w/par.	0.80	0.46, 1.39	0.60	0.35, 1.02	0.41 *†	0.20, 0.85
		Not living w/par. (ref.)	—	—	—	—	—	—
Model χ^2			2045.56	***	2052.82	***	2071.66	***

* $p < .05$, ** $p < .01$, *** $p < .001$ N: 3,644.

Note: All models include controls from Table 3.

† Although the p-value is smaller than the conventional .05 alpha, it exceeds the Bonferroni-Holm adjusted alpha.

Figure 2. Changes in odds of graduation—interactions of role configurations and binge drinking.

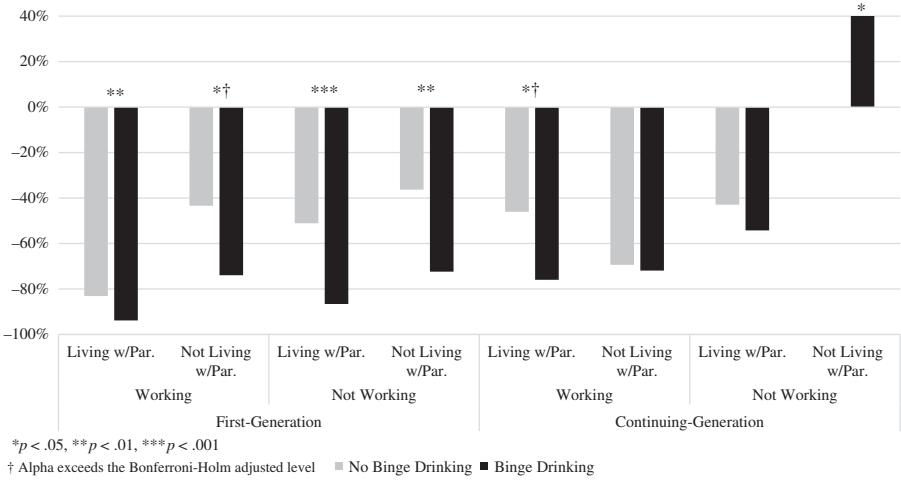
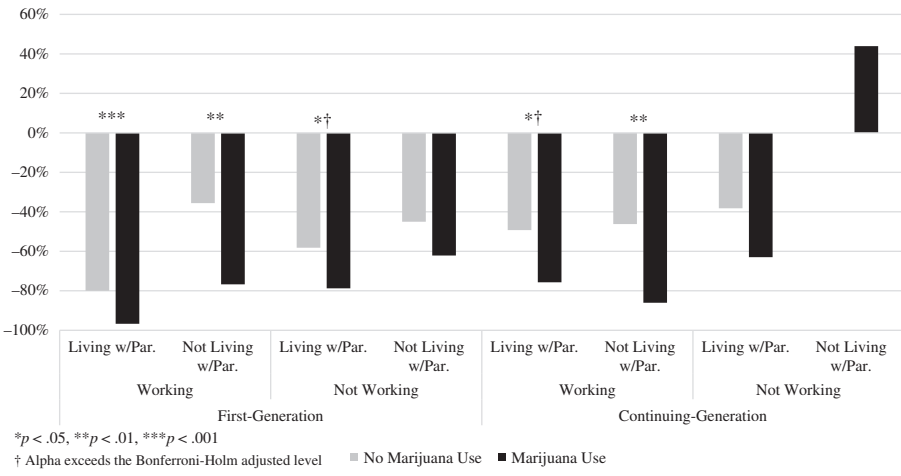
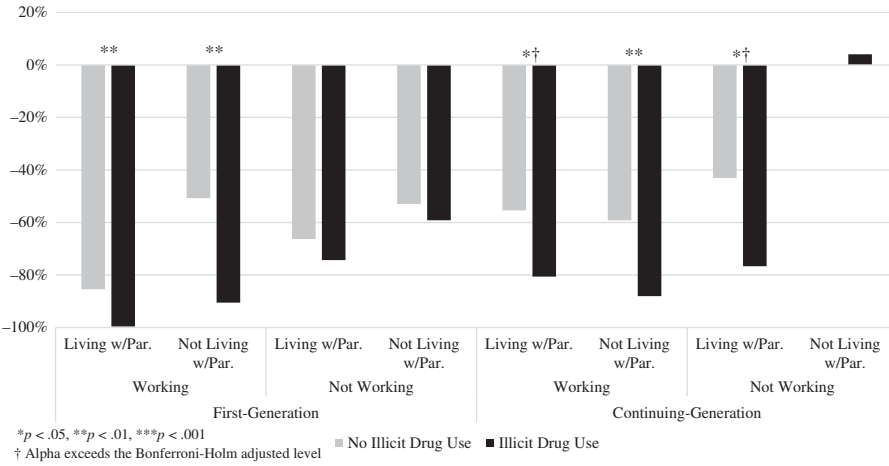


Figure 3. Changes in odds of graduation—interactions of role configurations and Marijuana use.



of other drug use is again not statistically significant, indicating that there was no difference in the odds of graduation for the most traditional students who used illicit drugs and those who did not. Five of the 7 interaction terms, however, are statistically significant with odds ratios below one, suggesting other drug use was associated with a lower odds of graduation for most other groups (note again that two lose significance following Bonferroni–Holm adjustment). Overall, the results are fairly similar to those observed for marijuana use (see Figure 4), as other illicit drug use was most consistently and negatively

Figure 4. Changes in odds of graduation—interactions of role configurations and illicit drug use.



associated with graduation among those who were working, regardless of generation status.

Sensitivity Analyses

One debate in studies of first-generation students is how to define first-generation. We have used a broad definition that included students for whom neither parent had *completed* a four-year degree. To test the robustness of our results, we re-examined all models with a narrower definition that included only students whose parents had no postsecondary enrollments, with the continuing-generation expanded to include parents with some postsecondary experience. Although this cut the number of first-generation students by more than half, the same general pattern of results was observed. Thus, we feel confident that the definition of first-generation is not driving the results.

A related issue is the appropriate way to capture social class among college students. Despite a large number of controls for parental education, occupation, welfare receipt, and neighborhood disadvantage, a remaining concern is lack of data on family income and wealth. To partially address this we used data from parent reports of family income in 1994, to examine whether being low income and first-generation was more strongly associated with graduation than was first-generation alone. Low income was defined as less than $30,000 (roughly twice the federal poverty guideline for a family of 4 in 1994). For three of the four first-generation groups, low income seemed to add little explanatory information. For example, the graduation rate for first-generation students living with parents, working, and low income was 19 percent compared to 21 percent for the non-low income. For those not living with parents and working the graduation rate was 37 percent, compared to 35 percent of the non-low income. These differences were not statistically significant. The only group for whom

income seemed to differentiate was among first-generation students not working nor living with parents (57 percent graduating among the low income, versus 67 percent for the non-low income), though this difference was also not statistically significant. Lastly, in a replication of the graduation model from Table 3, an indicator for low income status was not statistically significant.

Our focus on those living with parents may be missing important variation across the residential settings of those *not* living with parents. Although small cell sizes preclude us from a thorough analysis of all the possible configurations of generational status, work, and residences such as dorms, fraternities, sororities, and off campus housing, we were able to compare those living on campus (i.e., in dorms or fraternities/sororities) versus off campus. These results suggest that the largest odds of substance use were for those in off campus housing. Those living with parents remained least likely to use substances.

As noted above, our binary measure of binge drinking represents any binge drinking during the last two weeks. As an additional sensitivity analysis, we employed a count measure of binge drinking (ranging from 0 to 14 days) to investigate the extent to which frequency of binge drinking is associated with college graduation. Overall, the results are consistent with those presented, as binge drinking was most negatively associated with graduation for first-generation students. However, the main effect associated with this binge drinking measure in our interaction model (i.e., the effect of binge drinking for the most traditional students), although still positive, was not statistically significant.

As the negative academic consequences associated with work have been found to increase with the number of work hours (Kalenkoski and Pabilonia 2010), we chose a cutoff of 30 hours a week or more. However, we recognize that this cutoff might be exaggerating the consequences of work. Thus, we re-examined our models using a cutoff of 20 hours per week, and found that the results were largely consistent with those presented here.

We chose to include in the analysis all students enrolled in postsecondary educational institutions, whether they were in two-year or four-year institutions. Despite controls for institutional types, a concern might be that some of the differences observed are a function of the varying enrollments of first- and continuing-generation students. Thus, we ran our models separately for the subsample of students enrolled in four-year institutions. The results are strikingly similar to those presented previously, and in some cases resulted in slightly larger and more statistically significant associations.

Finally, some previous research into the consequences of the party subculture has examined the experiences of men (Hagan 1991) and women (Armstrong and Hamilton 2013) separately. Although the development of gender-specific hypotheses is beyond the scope of the present study, as a final sensitivity analysis we examined our models separately by gender. For the most part, the patterns were similar for men and women. For example, for both men and women the most traditional students were among the most likely to engage in binge drinking and marijuana use. Similarly, other illicit drug use was associated with a lower odds of graduation for both men and women. It was also the case that substance use was least damaging to the graduation prospects of the most

traditional men and women. One subtle difference, however, that future research might explore is that the "benefit" of binge drinking and marijuana use for graduation among the most traditional students was accentuated for women. All results from these sensitivity analyses are available upon request.

Discussion

This paper has examined differences in binge drinking, marijuana use, and other illicit drug use among college students, and their consequences for completion of a four-year degree, for groups of first-generation and continuing-generation students defined by role configurations of work and residence with parents. These are timely questions given renewed concerns about the role of alcohol and drugs, as well as the challenges faced by first-generation students.

We found support for our hypothesis that the most traditional continuing-generation students would be more likely to engage in substance use than first-generation students. This was particularly true in the cases of binge drinking and marijuana use. When comparing the life course role configuration groups, in all cases the continuing-generation students who were not working heavily nor living with parents were among the most likely to binge drink or use marijuana. However, the pattern of results was complex, and was also related to working long hours and residence with parents.

Our central question was to examine the differential consequences of substance use for graduation across the role configuration groups. The most consistent finding was that substance use does not appear to be detrimental to the graduation prospects of the most traditional continuing-generation students. In fact, any binge drinking was found to be positively associated with graduation for this group, though this relationship differed when frequency rather than prevalence of binge drinking was measured. In contrast, among most first-generation students, binge drinking, marijuana use, and other illicit drug use were associated with poorer prospects of graduation.

Why is substance use not more detrimental for the most traditional continuing-generation students? Previous research suggests several possibilities. Given the pervasiveness of the party subculture on campuses, perhaps substance use is simply viewed as a part of going to college for many students, and may be an indirect measure of social integration. Indeed, the development of social capital was part of Hagan's (1991) explanation for the benefits of the party subculture for middle-class high school students. Armstrong and Hamilton's (2013) research suggested that the party subculture, combined with easier majors, was a pathway to social reproduction for more advantaged students. It should also be recalled that our comparison of a dichotomous any binge drinking measure, to a continuous measure, suggested that the benefits of binge drinking were confined to less frequent levels, which would be consistent with a social integration explanation.

Our finding with respect to the detrimental consequences of binge drinking for first-generation students is also consistent with Armstrong and Hamilton's (2013) research, which found the party subculture to derail the mobility

pathways of less advantaged students. Other research shows that heavy drinking is associated with less time preparing for classes, lower attendance, lower grade point averages, non-completion (An et al. 2017; Martinez et al. 2009; Pascarella et al. 2007), as well as negative health outcomes including long-term alcohol dependence and abuse, physical and sexual assaults, accidents, and mortality (Merrill and Carey 2016; White and Hingson 2013). Although not an initial focus, our results also highlight that first-generation students are more likely to be married and have children, factors which we found had a double-edged nature, protecting against substance use while at the same time being negatively associated with graduation. Future research should further explore the role of familial responsibilities among first-generation students.

Although we were not able to fully assess parenting practices (beyond co-residence and provision of financial help), Hamilton's *Parenting to a Degree* (2016) suggests that social class differences in parents' conceptions of the college experience, adulthood, and their corresponding parenting strategies, may help to interpret our findings. Hamilton observed that advantaged parents were more likely to engage in "helicopter" parenting, and to intervene in times of trouble, whereas disadvantaged parents tended to view their children as independent adults, thus taking a hands-off or "bystander" approach. Moreover, many advantaged parents saw partying as a valuable part of the college experience, and may have socialized their children to better manage its consequences (Hamilton 2016). Further examining the role of parents and other mechanisms that might explain class differences in the consequences of substance use would be fruitful avenues for future research.

We also found support for our hypotheses regarding the role of residence during college. Living with parents was found to be protective against substance use, yet at the same time was negatively associated with graduation. The protective role of living with parents is consistent with previous studies of substance use (Cacciola and Nevid 2014; Simons-Morton et al. 2016; Wechsler and Nelson 2008; White et al. 2006). As noted previously, we are likely missing variability of residences among those not living with parents. For example, previous research suggests that living in dorms and involvement with fraternities are positively associated with substance use and alcohol related problems (Carter, Brandon and Goldman 2010; McCabe, Veliz, and Schulenberg 2018; Wechsler, Kuh, and Davenport 2009). Our sensitivity analyses suggested that those living off campus were most at risk of substance use. Unfortunately, data limitations precluded us from examining whether this varied by distance from campus or commuting time. Future research is needed to consider the experiences of first- and continuing-generation students in these varied residential contexts.

Our findings regarding employment during college provided partial support for our hypotheses, yet also presented some unexpected patterns. As expected, extensive work was negatively associated with graduation. Not anticipated, however, was the uniquely negative consequences for graduation of the combination of work and marijuana or other illicit drug use, regardless of generation status. Several potential explanations are tentatively proposed. On the one hand, long work hours likely creates conflicts with student role demands, which

combined with drug use may place students at particular risk for educational difficulties. Alternatively, the combination of drug use and work may be a proxy for the setting in which drug use is occurring. Drug use with work colleagues may draw students away from more college-oriented social networks. Finally, as has been reported in the adolescent work literature (e.g., Staff, Schulenberg, and Bachman 2010; Warren 2002), the combination of long work hours and drug use may reflect unobserved differences in student engagement or educational performance. Those who are doing poorly in school or who anticipate that graduation is unlikely may select into long work hours and drug use. Future research into the interplay between substance use and employment among college students is needed to disentangle these potential explanations.

We focused on substance use, and did not consider other elements of the campus party subculture. Armstrong and Hamilton's (2013) research, as well as that of Sweeney (2014), also examined the role of sexual relationships. Future research examining connections between substance use and risky sexual behavior is thus needed. We also primarily focused on one dimension of educational attainment (and social class)—parent's and respondent's completion of a four-year degree. Although we would argue this is an important first step, understanding the consequences of substance use for other measures of educational success (e.g., on-time graduation versus delayed), and for socioeconomic attainments more broadly, awaits future research. For example, research shows that inequalities in the selectivity of colleges between first- and continuing-generation students affect career earnings (Rothwell 2015; Witteveen and Attewell 2017). Compared to those with only a high school diploma, the payoff to college is less for those coming from families with fewer socioeconomic resources (Hershbein 2016). Other research has emphasized the growing importance of graduate degrees (Torche 2011).

Conclusion

The present study has shown that the likelihood of engaging in substance use, and the consequences of such substance use, vary for first- and continuing-generation students. Traditional continuing-generation students were found to engage in more substance use than other students, but this substance use had little if any consequences for their eventual graduation. In contrast, among most other groups of students, particularly first-generation, substance use was negatively associated with graduation.

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