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Alcohol Use and Popularity: Social Payoffs From Conforming to Peers' Behavior

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Although many economic analyses of adolescents have examined the costs of risky behaviors, few have investigated the gains that young people derive from such actions, particularly in terms of social payoffs for complying with peer behavior. This paper studies the relationship between adolescents' use of alcohol (relative to that of their peers) and popularity at school. We use data from the National Longitudinal Study of Adolescent Health, a rich and nationally representative survey with detailed information on social networks. Our findings suggest that adolescents are socially rewarded for conforming to their peers' alcohol use and penalized (to a lesser degree) for increasing their consumption above that of their peers. Male adolescents are rewarded for keeping up with their peers' drinking and for getting drunk. Female adolescents are rewarded for drinking per se, but not necessarily for keeping up with their peers. The results offer new information on peer influence and have implications for substance abuse interventions at school and in the community.

A large body of research has underscored the importance of peer influence in adolescents' decisions to use substances. The relationships between individuals and their peer context are complicated, in part because individuals may elect to join peer groups with similar behaviors (selection) and because the influence between individuals and their peers is bidirectional (reverse causality). Despite these empirical challenges, a number of studies have found strong peer effects (Ennett & Bauman, 1994; Kremer & Levy, 2003; Lundborg, 2006; Urberg, 1992).

Less empirical evidence exists on how peer influence is transmitted, with several authors positing that adolescents use substances to gain recognition and maintain their status among peers (Mitchell & Amos, 1997; Plumridge, Fitzgerald, & Abel, 2002; Prinstein & Cillessen, 2003; Prinstein, Meade, & Cohen, 2003). Social learning theory predicts that individuals conform to behaviors that they believe will earn them high levels of peer status (Bandura, 1973). The theory of social identity contends that individuals adopt those behaviors that are central to the social identity of the group to which they feel attached (Kobus, 2003). Among economists, Becker (1996) proposes that individuals attain utility from the consumption of goods and services and from attributes of "social capital" such as prestige, recognition, and social status. Demand for goods and activities that are complements to social capital would be expected to increase, ceteris paribus. Akerlof (1997) constructed a model in which individuals derive utility from behaving like the average person in a reference group. These theories all contend that individuals pursue peer recognition, either as an end or a means to an end, when making behavioral decisions.

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To examine the effects of adolescent behavior on social status, studies generally rely on social network data from schools (Becker & Luthar, 2007; de Bruyn & Cillessen, 2006; Fryer & Torelli, 2005; Kreager, 2007; Strauss & Pollack, 2003). Social status is often measured as the number of friendship nominations received by adolescents from members of their social networks at school (sociometric popularity) or the number of individuals who consider the adolescent to be popular (consensual or perceived popularity). The concept of sociometric popularity reflects how likeable the individual is in his or her network and depends less upon individual judgments than consensual popularity.

Most of the studies exploring the role of network position on substance use have found an association between the adoption of these behaviors and an individual's social standing within his or her network (Alexander, Piazza, Mekos, & Valente, 2001; Allen, Porter, McFarland, Marsh, & McElhaney, 2005; Bot, Engels, & Knibbe, 2007; Ennett et al., 2006; Valente, Unger, & Johnson, 2005). Killeya-Jones, Nakajima, and Costanzo (2007) found that 7th grade students who used substances at the start of school enjoyed elevated standing among their peers and maintained this standing regardless of their substance use later in the school year. Substance use that began toward the end of the school year, however, did not produce differences in peer ratings of popularity between users and abstainers. The authors interpreted these findings as evidence that network position affects substance use.

Unlike most of the existing research, this paper empirically analyzes the social rewards and penalties that adolescents derive from conforming to peer norms. Specifically, we study the relationships between adolescents' alcohol use, alcohol use by classmates, and sociometric popularity. Our analysis uses data from the National Longitudinal Study of Adolescent Health (Add Health), a rich, nationally representative data set that facilitates the identification of school social networks. To moderate the problem of selection into small groups of friends, we define the peer context for each adolescent as all the students in the same grade at the same school (i.e., *classmates*). The analysis is conducted separately for male and female students.

Using a framework similar to that in Becker (1996), we expect that adolescents will be more (less) likely to internalize prescribed actions or behaviors as social rewards for adopting these behaviors increase (decrease). We view individual drinking that closely matches classmates' drinking as conforming behavior and significant departures from the norm as nonconforming behavior. We hypothesize that alcohol use will enhance (detract from) popularity as the level of consumption for a particular student conforms to (diverges from) the mean for their classmates. The analysis also evaluates whether rewards for conformist drinking patterns differ in magnitude from penalties for nonconformist patterns and how rewards for becoming a drinker compare with those for higher drinking levels.

METHOD

Data

Add Health is a nationally representative study that explores the causes of health-related behaviors among adolescents in Grades 7–12. An initial school survey was administered to 90,118 students attending 175 schools in the 1994–1995 school year. Of these, 20,745 students (and their parents) were administered an additional In-Home interview. Longitudinal information was collected on these students at 1- and 5-year follow-ups.

The In-School Questionnaire in Wave 1 produced social network data for most students in 129 schools. Students were asked to identify up to five male friends and five female friends from the roster of all students enrolled in the respondent's school and/or the sister school (i.e., the main feeder school). For each individual, we used a preconstructed measure of sociometric popularity computed as the number of friendship nominations received. This objective index of friendship nominations (raw popularity) overcomes many of the problems related to self-reported perceptions of social status (Norton, Lindrooth, & Ennett, 2003). Because the number of friendship nominations may be related to the size of the peer context and other unobserved characteristics and behaviors of the cohort, we constructed a standardized measure of popularity. Namely, we created a popularity z-score, which subtracts the average popularity of students in the same grade and school (the classmates) from the adolescent's own popularity and divides it by the standard deviation of classmates' popularity.

Two questions in the In-School surveys address the frequency of drinking and frequency of drinking to intoxication in the past year.[1] Responses to these

[1]The questions were: "During the past 12 months, on how many days did you drink alcohol?" and "Over the past 12 months, on how many days have you gotten drunk or 'very, very high' on alcohol?" In each of these questions, adolescents were offered seven options: every day or almost every day, 3 to 5 days a week, 1 or 2 days a week, 2 or 3 days a month, 3–12 times in the past 12 months, 1 or 2 days in the past 12 months, never.

questions are captured in seven categories ranging from ''never in the past year'' to ''almost every day in the past year.'' Using the midpoint in days for each category, we constructed two frequency variables: one for drinking and the other for drinking to intoxication. We also defined two indicators for whether the individual drank in the past year and whether the respondent got drunk in the past year.

For each continuous measure of individual alcohol use (frequency drinking in the past year, frequency getting drunk in the past year), peer use was computed as the prevalence of the respective measure among students in the same grade and school as the respondent (i.e., classmates).

An extensive set of control variables was obtained from the In-School, In-Home, and Parent interviews. Questions from the In-School survey were used to obtain age, race, gender, grades in English and Math, years at the current school, participation in school activities, and information about the school grade (racial makeup, percent male, average age, and size). From the In-Home file, we obtained language spoken at home, disability status, birth order, household structure (single parent and other nonintact household, number of children in household, presence of residential mother or father), parental work and education, parental welfare status, height, body mass index (BMI), PVT ability test, smoking, cannabis use, interview time (fall or spring), presence of parent during interview, and interviewer ratings of physical attractiveness, personality, and grooming. Information on household income was from the parent interview.

Of the 20,745 observations available from the Wave 1 In-Home sample, 6,289 did not have information on sociometric popularity. These were students in school that were not administered the friends questionnaire, students who did not complete the In-School interview but were listed on the school roster and were eligible for the In-Home interview, students whose names did not appear on the school roster due to errors or because they were new to the school, or students in schools with low response rates or problematic identification numbers. An additional 946 individuals did not have valid information on the frequency of alcohol use. We also excluded 354 observations that belonged to special education schools or individuals in 6th grade. For a few of the control variables that had missing values for more than 1% of the observations (i.e., birth order, parental education, household income, welfare status, English and Math GPA, BMI, and PVT score), we filled in the missing data using multivariate normal multiple imputation (Rubin, 1987). Estimation included 20 different imputed data sets. Observations with $<1\%$ missing values for other control variables were dropped from the analysis (609). Our final sample had 12,547 respondents belonging to 111 schools.[2]

Individuals included in our analysis sample were less likely to get drunk and showed lower drinking frequencies than those excluded from the analysis. They were also more likely to belong to intact families and to households of higher socioeconomic status (parents were more educated, more likely to be employed, and had a higher likelihood of working in a white collar job). These differences should be considered when interpreting the estimation results, as our findings may not be representative for all types of students.

The number of friend nominations ranged from 0 to 32, with an average of 4.47 (see Table 1). Adolescents who reported drinking alcohol in the past year were more popular than abstainers. More than half of the student body in Wave 1 (55%) drank alcohol in the 12 months before the interview, and 30% got drunk at least once during that year. The average drinking frequency (including zeros for abstainers) was 20 days per year and the average frequency of getting drunk was 12 days per year.

While not shown in the table, male respondents received an average of 4.2 friendship nominations and female respondents received an average of 4.6 nominations. Regarding drinking patterns, 53% of girls and 56% of boys in Grades 7–12 reported drinking some alcohol in the past 12 months. One out of three boys reported getting drunk at least once in the past year, with a slightly lower prevalence for girls (28%).

Empirical Methods and Estimation Issues

The first empirical challenge in our analysis is to address the confounding effects of peer selection and influence. A number of studies have shown that the strongest influential processes operate in dyads of best friends (Alexander et al., 2001; Urberg, 1992). When considering alcohol use of close friends, it is unclear whether associations reflect the influence of these peers on the individual's alcohol consumption or whether they reflect selection into groups of equals. Adolescents who enjoy drinking may be more likely to select peers who also drink, thereby enhancing popularity in a group with similar interests. If popular

[2] Of the 144 schools originally selected for the study, only 129 produced social network data. Because our analysis sample comprised only adolescents selected for the In-Home interview, we had to drop an additional 18 out of those 129 schools that did not have enough observations to run the multivariate analysis at the school level.

TABLE 1
Variable Means for the Full Sample and by Drinking Status

	Full sample (N = 12,547)				Nondrinker in past year (n = 5,715)	Drank alcohol in past year (n = 6,832)	
	Mean	SD	Minimum	Maximum	Mean	Mean	t/z test
Popularity measures							
Raw popularity (# nominations)	4.469	3.671	0.000	32.000	4.173	4.714	***
Popularity *z*-score	0.059	1.016	−1.878	6.554	−0.011	0.117	***
Alcohol use measures							
Drank any alcohol past year	0.547	0.498	0.000	1.000	0.000	1.000	N/A
Days drank past year (in tenths)	2.011	5.768	0.000	33.800	0.000	3.676	N/A
Got drunk at least once past year	0.303	0.459	0.000	1.000	0.000	0.549	N/A
Days getting drunk past year (in tenths)	1.211	4.764	0.000	33.800	0.000	2.199	N/A
Peers' drinking frequency (in tenths)	1.960	1.008	0.000	16.900	1.706	2.170	***
SD peers' drinking frequency	51.782	17.871	0.000	176.978	48.198	54.750	***
Peers' frequency drunk (in tenths)	1.199	0.708	0.000	10.400	1.037	1.334	***
SD peers' frequency drunk	41.977	17.575	0.000	112.434	38.929	44.502	***
Control variables							
Age	15.666	1.664	11.219	20.477	15.268	15.995	***
Hispanic	0.151	0.358	0.000	1.000	0.141	0.160	***
Black	0.209	0.406	0.000	1.000	0.226	0.194	***
Other race	0.165	0.371	0.000	1.000	0.183	0.149	***
Male	0.478	0.500	0.000	1.000	0.460	0.493	***
English GPA (imputed)	2.863	0.930	1.000	4.000	3.010	2.741	***
English GPA missing	0.024	0.155	0.000	1.000	0.019	0.029	***
Math GPA (imputed)	2.692	0.994	1.000	4.000	2.818	2.587	***
Math GPA missing	0.071	0.257	0.000	1.000	0.048	0.090	***
First year in current school	0.252	0.434	0.000	1.000	0.281	0.229	***
Three or less years in current school	0.751	0.433	0.000	1.000	0.786	0.722	***
School activities: arts	0.270	0.444	0.000	1.000	0.315	0.234	***
School activities: sports	0.590	0.492	0.000	1.000	0.600	0.582	**
School activities: other	0.453	0.498	0.000	1.000	0.463	0.444	**
# School activities	2.378	2.552	0.000	33.000	2.430	2.334	*
Interviewed in the fall	0.165	0.372	0.000	1.000	0.163	0.167	
Interviewed in the spring	0.084	0.278	0.000	1.000	0.085	0.083	
% Blacks in school grade	0.160	0.206	0.000	0.903	0.166	0.155	***
% Hispanic in school grade	0.174	0.207	0.000	0.911	0.179	0.169	***
% Male in school grade	0.506	0.068	0.167	1.000	0.503	0.509	***
Average age in school grade	15.108	1.564	11.993	17.720	14.732	15.419	***
School grade size	262.414	176.547	2.000	697.000	264.954	260.310	*
English spoken at home	0.892	0.311	0.000	1.000	0.877	0.904	***
Disability flag	0.033	0.178	0.000	1.000	0.026	0.038	***
Birth order (imputed)	2.033	1.097	1.000	15.000	2.015	2.048	*
Birth order missing	0.210	0.407	0.000	1.000	0.192	0.226	***
Single parent household	0.224	0.417	0.000	1.000	0.209	0.236	***
Other nonintact household	0.191	0.393	0.000	1.000	0.170	0.209	***
# Children in the household	1.211	1.188	0.000	10.000	1.304	1.133	***
Resident mother	0.953	0.211	0.000	1.000	0.963	0.945	***
Resident father	0.728	0.445	0.000	1.000	0.755	0.706	***
Parent w/college degree (imputed)	0.503	0.500	0.000	1.000	0.533	0.478	***
Parental education missing	0.018	0.134	0.000	1.000	0.023	0.014	***

TABLE 1 (Contd.)

	Full sample (N = 12,547)				*Nondrinker in past year (n = 5,715)*	*Drank alcohol in past year (n = 6,832)*	
	Mean	*SD*	*Minimum*	*Maximum*	*Mean*	*Mean*	*t/z test*
Resident mom white collar	0.507	0.500	0.000	1.000	0.504	0.509	
Resident mother works	0.826	0.379	0.000	1.000	0.827	0.825	
Resident father white collar	0.265	0.441	0.000	1.000	0.283	0.249	***
Resident father works	0.691	0.462	0.000	1.000	0.719	0.668	***
Parent on welfare (imputed)	0.093	0.290	0.000	1.000	0.099	0.088	**
Welfare status missing	0.007	0.085	0.000	1.000	0.009	0.006	*
Height	66.258	4.075	48.000	81.000	65.726	66.699	***
Body mass index (imputed)	22.552	4.415	11.745	63.493	22.219	22.828	***
Body mass index missing	0.014	0.119	0.000	1.000	0.015	0.014	
PVT ability test (imputed)	101.715	13.772	13.000	138.000	101.585	101.823	
PVT test missing	0.047	0.211	0.000	1.000	0.050	0.044	*
Any smoking past year	0.353	0.478	0.000	1.000	0.102	0.561	***
Smoking frequency past year	0.189	0.392	0.000	1.000	0.033	0.318	***
Used cannabis past 30 days	0.133	0.339	0.000	1.000	0.033	0.215	***
Parent(s) present during interview	0.188	0.391	0.000	1.000	0.208	0.171	***
Physical attractiveness (interviewer)	3.594	0.868	1.000	5.000	3.565	3.619	***
Personality attractiveness (interviewer)	3.635	0.833	1.000	5.000	3.654	3.619	**
Grooming (interviewer)	3.588	0.782	1.000	5.000	3.618	3.563	***
Household income in US dollars thousands (imputed)	44.183	48.294	0.000	999.000	43.041	45.128	**
Household income missing	0.247	0.431	0.000	1.000	0.246	0.248	

*Covariate difference between nondrinkers and drinkers statistically significant at 10%; **covariate difference statistically significant at 5%; ***covariate difference statistically significant at 1%.

individuals attract each other, any findings of a relationship between popularity and distance from the normative levels of alcohol use could reflect both selection and influence processes. An additional concern is whether an individual is mostly influenced by same-sex peers or by peers of the opposite sex. We address this issue in the sensitivity analysis.

It would be best to address selection with longitudinal data. Unfortunately, comprehensive measures of friendships at school are only available in Wave 1 of Add Health, eliminating the possibility of using panel data methods in our estimation. Parents can choose schools for their children, but they usually do not choose the particular cohort that corresponds to the adolescent's grade level, conditional on having chosen a school. Unlike previous studies that consider the group of close friends as the relevant peer group, we define the peer context for each adolescent as all students in the same grade at the same school. By including 110 dummy variables corresponding to each participating school (i.e., school fixed effects), we account for those characteristics that are common for all students in the same school and focus on comparisons across grades within schools. Although the choice of such a large peer context may provide a conservative or lower bound for effect sizes, it moderates potential biases due to selection processes.

To formalize the empirical model, let $Z_{\mathrm{Pop}_{igs}}$ be a standardized measure of social status or popularity defined as:

$$Z_{\mathrm{Pop}_{igs}} = (\mathrm{Pop}_{igs} - \overline{\mathrm{Pop}}_{-igs})/\sigma_{\mathrm{Pop}_{-igs}} \qquad (1)$$

where Pop_{igs} is the number of friendship nominations received by student i in grade g at school s, $\overline{\mathrm{Pop}}_{-igs}$ is the average number of nominations received by peers of i in grade g at school s (i's classmates), and $\sigma_{\mathrm{Pop}_{-igs}}$ is the standard deviation of the popularity of i's grade g and school s classmates. As expected, the distribution of Z_{Pop} is skewed to the right (see Figure 1).

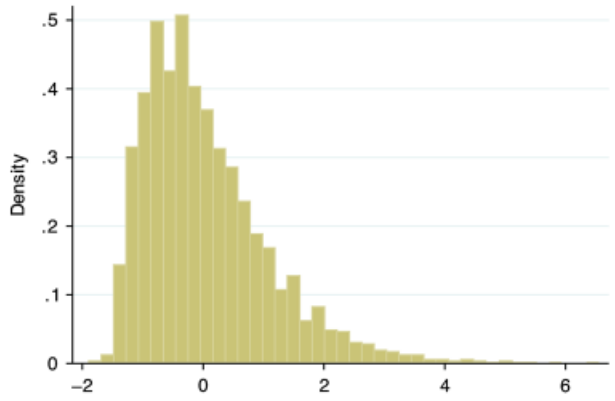

FIGURE 1 Standardized popularity.

In the same way, let $Z_{A_{igs}}$ be a standardized measure of frequency of alcohol use defined in terms of the drinking distribution of students in the same grade and school as adolescent i:

$$Z_{A_{igs}} = (A_{igs} - \bar{A}_{-igs})/\sigma_{A_{-igs}} \quad (2)$$

where A_{igs} is the drinking frequency (or frequency getting drunk, depending on the specification) of adolescent i, $\bar{A}_{-igs}$ is the average drinking frequency of i's classmates (or classmates' frequency of getting drunk), and $\sigma_{A_{-igs}}$ is the standard deviation of the drinking frequency of i's classmates (or i's classmates' frequency getting drunk) in grade g at school s.

We are interested in the social rewards or penalties (captured by changes in popularity) experienced by adolescents as their levels of alcohol intake (A_{igs}) approach or diverge from the average alcohol intake of their classmates ($\bar{A}_{-igs}$). Our main dependent variable is the standardized measure of popularity, $Z_{\text{Pop}_{igs}}$, and our operational measure of alcohol use is the standardized frequency of alcohol use, $Z_{A_{igs}}$. In our analysis, we decompose $Z_{A_{igs}}$ into two parts: $Z^{+}_{A_{igs}}$ contains the values of $Z_{A_{igs}}$ for all adolescents whose drinking frequency exceeds that of their classmates in the same grade and school ($Z^{+}_{A_{igs}} = Z_{A_{igs}}$ if $A_{igs} > \bar{A}_{-igs}$ and $Z^{+}_{A_{igs}} = 0$ otherwise), and $Z^{-}_{A_{igs}}$ contains the values of $Z_{A_{igs}}$ for all adolescents who drink less frequently than their classmates in the same grade and school ($Z^{-}_{A_{igs}} = Z_{A_{igs}}$ if $A_{igs} < \bar{A}_{-igs}$ and $Z^{-}_{A_{igs}} = 0$ otherwise). By including both $Z^{+}_{A_{igs}}$ and $Z^{-}_{A_{igs}}$ as explanatory variables, we are able to isolate the associations between popularity and alcohol use when the student is above and below the class average. The model also contains $D_{A_{igs}}$, a dummy variable that captures whether the respondent drinks (or gets drunk), to differentiate changes in drinking status from increases in frequency.

The full empirical model is specified as follows:

$$Z_{\text{Pop}_{igs}} = \alpha_0 + \alpha_1 D_{A_{igs}} + \alpha_2 Z^{-}_{A_{igs}} + \alpha_3 Z^{+}_{A_{igs}} + X'_{igs}\alpha_4 + \bar{X}'_{-igs}\alpha_5 + F'_s\alpha_6 + \varepsilon_i \quad (3)$$

where X_{igs} captures demographics, interview assessments, household characteristics, and other individual factors such as involvement in extracurricular activities in school. Because these variables are potentially related to both alcohol use and popularity, failure to include them as controls may bias the estimation. Previous studies have identified individual- and family-level variables that are associated with alcohol consumption during adolescence (Hawkins, Catalano, & Miller, 1992; National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2004/2005). Participation in athletics and other school activities as well as academic achievement are related to alcohol use (Eccles & Barber, 2001; Hawkins et al., 1992; Hoffmann, 2006) and popularity in high school (Becker & Luthar, 2007; Fryer & Torelli, 2005; Kennedy, 1995). Drinking patterns and the factors associated with popularity have also been shown to differ by race and ethnicity (Fryer & Torelli, 2005; Johnston, O'Malley, Bachman, & Schulenberg, 2009; Kennedy, 1995). Household characteristics such as family structure and income may be directly associated with adult supervision, a likely correlate of alcohol use and popularity (Barnes, Reifman, Farrell, & Dintcheff, 2000; Kennedy, 1995; NIAAA, 2004/2005). In addition to considering individual-level characteristics, the vector $\bar{X}_{-igs}$ includes measures of average age, gender, and race prevalence for peers of i in grade g at school s, as well as classroom size. These variables may capture characteristics at the group level that are potentially associated with average alcohol consumption. F_s is a vector of 110 dummy variables equaling one if i's school corresponds to school s and zero otherwise. $\alpha_0 - \alpha_6$ are parameters to estimate. All models are estimated using ordinary least squares with standard errors clustered at the school level.

RESULTS

We estimated Equation (3) for two distinct measures of alcohol use: the number of days that the respondent drank alcohol in the past year (Table 2) and the number of days that the respondent got drunk in the past year (Table 3). In addition to estimating the model for the full sample, we ran separate specifications by gender.

TABLE 2
Z-Score Associations Between Relative Drinking Frequency and Popularity

	b/SE		
	Full Sample	*Males*	*Females*
Drank any alcohol past year	0.131*** (0.027)	0.077** (0.037)	0.188*** (0.031)
Z^- (drinking frequency if < peer average)	1.663** (0.658)	3.345*** (1.050)	0.006 (0.973)
Z^+ (drinking frequency if > peer average)	−0.040 (0.091)	−0.076 (0.119)	−0.061 (0.176)
N	12,547	5,988	6,559

**$p < .05$; ***$p < .01$.

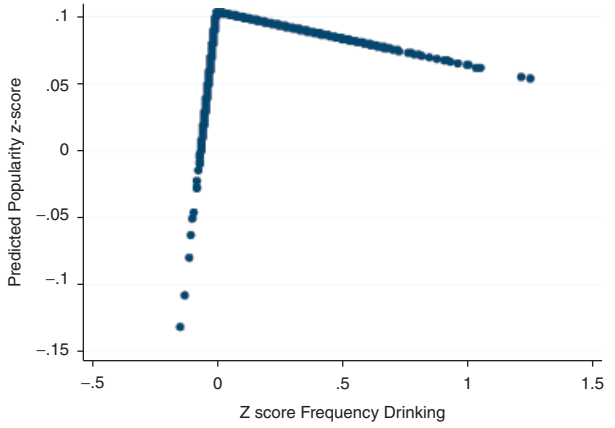

FIGURE 2 Proximity to peers' drinking frequency and popularity (full sample).

Among all adolescents with a drinking frequency below their classmates' average, drinking any alcohol and approaching their classmates' average frequency of alcohol use (as denoted by Z^-) is associated with higher levels of popularity (see Table 2). For females, initiating alcohol use appears more important than conforming to the peer norm. Males, on the other hand, show higher levels of popularity when they keep up with their classmates' drinking frequency. Consuming alcohol with a higher frequency than the grade average is associated with lower levels of popularity, although the effect is not statistically significant. These results suggest that adolescents may be socially rewarded for conforming to the alcohol use frequency of their peers, and could incur a popularity penalty for using alcohol at a higher frequency than their peers (Figure 2).

We observe a similar pattern of behavior when we change the relevant measure of alcohol use to the number of days getting drunk during the past year (see Table 3). Popularity is positively associated with getting drunk at least once in the past year and with conforming to the classmates' average frequency. Once the frequency of getting drunk exceeds that of classmates, however, the association between popularity and frequency of getting drunk becomes negative for some groups of adolescents (Figure 3). Male students show the strongest associations between popularity and drinking to intoxication that converge to peer norms. Keeping up with peers in days of getting drunk is not associated with popularity benefits for female adolescents.

Other control variables in the models have the expected signs (complete estimation results are available from the authors upon request). Popularity is positively associated with being Hispanic (relative to White) and female, being a smoker, having used cannabis in the past month, being among the youngest siblings in the family, living with a mother

TABLE 3
Z-Score Associations Between Relative Frequency of Getting Drunk and Popularity

	b/SE		
	Full Sample	*Males*	*Females*
Got drunk at least once in past year	0.131*** (0.037)	0.090* (0.052)	0.174*** (0.043)
Z^- (frequency drunk if < peer average)	1.937** (0.982)	4.238*** (1.405)	−0.799 (1.580)
Z^+ (frequency drunk if > peer average)	−0.106 (0.091)	−0.185* (0.106)	−0.118 (0.173)
N	12,547	5,988	6,559

*$p < .10$; **$p < .05$; ***$p < .01$.

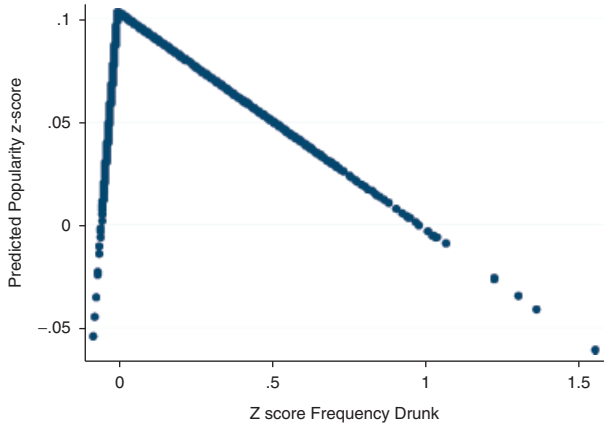

FIGURE 3 Proximity to peers' frequency getting drunk (full sample).

at home, having a parent at home with a college degree, having a white-collar resident parent, having higher household income, being attractive both physically and in terms of personality, having higher grades in English, and participating in sports and other school activities. Popularity is negatively associated with being Black (relative to White), having a parent present during the In-Home interview, smoking frequently, having a large number of siblings, being on welfare, and having a high BMI.

As a first robustness check, the models were re-estimated using a different peer context defined as all students in the respondent's grade, school, and gender group. Results were robust to this change in specification. In fact, the penalties for consuming above the peer mean were slightly stronger in this new specification, both in magnitude and statistical significance. The rewards for conforming to the peer context were similar for drinking frequency but smaller for the frequency of getting drunk.

To explore differential effects by age, we constructed a variable indicating if the student was a junior or senior in high school and interacted this variable with the Z^+ and Z^- variables (results available from the authors). Males in lower grades received greater rewards for conforming to the drinking frequency of their peers than juniors and seniors (the difference was significant at $p<.05$). Results also showed that the penalties for getting drunk at higher frequencies than the peer group were larger for male students in lower grades relative to juniors and seniors. None of the grade-specific interactions were significant for females.

DISCUSSION

This research sheds new light on the incentives associated with drinking by studying the social reinforcements that could be triggered by conformist behavior. We assess how the relative social status of adolescents within their peer context differs as individuals approach or diverge from the average alcohol use of their peer group. By defining the peer context as all students in the same grade and school, we are able to moderate the confounding effects of selection and influence. Relative social status is measured as a *z*-score, which reflects the adolescent's sociometric popularity relative to the average popularity of adolescents in his or her peer context.

In the case of male adolescents, our findings suggest a strong link between conformist behavior and frequency of alcohol use. Male adolescents with drinking frequencies around the peer mean are in the highest popularity ranks. Alcohol consumption above the peer group mean is associated with lower popularity levels. While female adolescents show higher popularity by drinking in small quantities, males optimize their relative social status by conforming to peer group norms in both drinking frequency and times getting drunk. These findings may help explain some of the gender differences in alcohol use patterns identified in surveys such as Monitoring the Future (Johnston et al., 2009).

Our findings are a contribution to the literature on popularity and various behaviors of adolescents, particularly alcohol use (Alexander et al., 2001; Allen et al., 2005; Becker & Luthar, 2007; de Bruyn & Cillessen, 2006; Fryer & Torelli, 2005; Kreager, 2007; Strauss & Pollack, 2003). As in prior studies, our analysis shows that risky behaviors by adolescents may be influenced by norms within their own immediate subcultures (Chen, Chang, & He, 2003; Stormshak et al., 1999). Our results also reinforce prior findings that moderate levels of drinking may enhance popularity, but consumption above group norms could lead to social rejection (Becker & Luthar, 2007; Prinstein et al., 2003).

These results should be considered within the context of some research limitations. First, our analysis cannot identify the direction of causality and whether there is a reciprocal relationship between individual alcohol use and popularity. In this sense, our results could also be compatible with the hypothesis that popular students influence the peer norms in their class. Second, we adjust for numerous individual and family characteristics, but there may be important unobserved factors that could bias the results. Third, our measure of popularity is a simple count of friend nominations available in the Add Health Network files, which is a somewhat limited measure of social status. Those with more peer nominations may be extroverted or have more acquaintances, but not necessarily be of higher social status. Alternative measures of social status are plausible (e.g., weight friendship nominations by the popularity of the nominating referent person), but there is no clear way to statistically rank alternative measures. Fourth, alcohol use may provide other social benefits to the adolescent, independent of the interaction with group norms. For example, a person may become more outgoing and friendly after consuming alcohol, thereby contributing to more close and intense social relationships. While the structure in our model is aimed at identifying rewards derived from conformist behavior, we cannot rule out these other effects.

Despite these limitations, we believe that this study presents novel and interesting information for

school administrators, parents, and policymakers concerned about alcohol use among adolescents. Underage drinking has been associated with serious health risks (e.g., traffic crashes, risky sexual behavior) as well as impaired brain development and negative educational outcomes (Renna, 2007; Steinberg, 2007). Results from the current study offer an explanation for why some adolescents decide to drink, even to the point of intoxication. Conforming to group norms in drinking patterns appears to provide students, especially males, with greater popularity. Understanding why adolescents may view alcohol consumption as socially rewarding and clarifying the mechanisms behind peer influence are crucial for the design of effective interventions.

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