



Published in final edited form as:

J Sex Res. 2012 ; 49(0): . doi:10.1080/00224499.2010.548012.

Young Adults and Casual sex: The Relevance of College Drinking Settings

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Abstract

The current study investigated the relevance of college drinking settings on the likelihood of students' having sexual intercourse with a stranger. A random sample of 7414 undergraduates at 14 public California universities responded to questions regarding frequency of attendance at six different setting types since the beginning of the semester (e.g. Greek, residence-hall parties, bars/restaurants), drinking behavior and sexual activity. Multi-level modeling examined the association between each setting type and the occurrence of alcohol-related sexual intercourse with a stranger. Findings indicated strong positive associations between frequency of attendance at Greek parties, residence hall parties, off-campus parties, and the occurrence of alcohol-related sex with a stranger. Frequency of attending the six settings and proportion of times drunk at the settings were also positively associated with alcohol-related sex with a stranger. Efforts aimed at preventing outcomes associated with casual sex (e.g. pregnancy, STIs, mental health) should target specific drinking settings where students might be at high risk for risky alcohol use and unsafe sex behaviors.

Keywords

College students; sexual behavior; drinking settings; alcohol; casual sex

Several studies have found that casual sex is not an unusual event among college students. For example, a random sample of undergraduate students found that 30% had engaged in sexual intercourse with a stranger or brief acquaintance in college and 48% had some physical interaction (but no sexual intercourse) with a stranger in college (Paul, McManus, & Allison, 2000). A study of Canadian university students found that 33% of college males reported having had sex with someone they had met that day or evening compared to 16% of females (Herold, Maticka-Tyndale, & Mewhinney, 1998). Young adults who have engaged in sexual intercourse with a relative stranger are significantly more likely to report a sexually transmitted infection (STI) than those who have not (Tanfer, Cubbins, & Billy,

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1995). It may be that the risk for STIs is potentially higher with partners whose sexual history is unknown. Sexual experiences outside of a romantic context have also been linked to negative socio-emotional outcomes such as depression (Grello, Welsh, & Harper, 2006). Given that adolescents and young adults acquire half of all new STIs (CDC, 2010), continued research on college students' risky sexual behavior can help inform appropriate and effective STI prevention strategies for this population.

Research with college students has documented a relationship between heavy alcohol use and risky sexual behaviors (Cooper, 2002). For example, a recent study examined the relationship between condom use, alcohol use, and partner type and found that alcohol use decreased condom use in casual sex partnerships (LaBrie, Earleywine, Schiffman, Pedersen, & Marriot, 2005). In addition, several studies have found a positive association between drinking and having a more casual sexual relationship - as measured by partner intimacy (e.g., from someone you just met to your fiancé, Cooper, Peirce, & Huselid, 1994; Cooper, Skinner, & George, 1990; Graves & Leigh, 1995; Testa & Collins, 1997), while others have found a positive association between heavy drinking and having multiple sexual partners (Poulin & Graham, 2001; Santelli, Robin, Brener, & Lowry, 2001; Thompson, Kao, & Thomas, 2005; Wechsler, Dowdall, Davenport, & Castillo, 1995). Research has explored psychological and cognitive mechanisms that may explain the relationship between drinking and risky sexual behavior (e.g., alcohol related sexual expectancies, alcohol myopia theory, propensity for sensation seeking), and psychosocial risk factors that contribute to alcohol related sexual behavior. The present study examined the relevance of drinking context on young adult sexual behaviors. This is an important avenue of research for both students and college administrators as it contributes to better understanding environmental factors associated with unwanted pregnancy, STI, and poor mental health outcomes in a college population.

A majority of studies which examine the relationship between alcohol use and sexual behavior utilize global associations, that is, simply assessing the correlation between the key variables of interest (e.g., frequency of binge drinking and frequency of casual sex). This methodology is limited because it does not take into account the co-occurrence of the two behaviors. The relationship between alcohol use and risky sexual behavior might be an artifact of a third variable such as sensation seeking, and thus drinking and risky sex may be occurring on separate occasions (see Cooper, 2002). Event analyses studies are a methodological improvement upon previous work in that these studies focus on a specific sexual incident (e.g., most recent sexual experience) and explore the use of alcohol and/or risky sexual behavior during that event. The current study is an improvement to previous research in that there is a shift away from global associations between drinking and sexual behaviors and towards event analysis; specifically, measures of location/drinking context, alcohol use, and sexual behavior are linked to one occasion.

To date, few studies have taken an ecological approach to examine how drinking contexts or settings may relate to the co-occurrence of alcohol use and risky sexual behaviors. This is surprising as a significant body of literature has focused on the role of settings on alcohol expectancies (e.g., Wall, McKee, Hinson, & Goldstein, 2001, Wall, McKee, & Hinson, 2000; Wingmore & Hinson, 1991, Zamboanga & Ham, 2008; Zamboanga, 2005) and drinking behaviors (Clapp, Shillington, & Segars, 2000; Demers et al., 2002; Paschall & Saltz, 2007). The situational-specificity hypothesis suggests that drinking behaviors and patterns are a function of environmental cues (see Wall et al., 2001). Cues unique to each environment influence alcohol expectancies (Wall et al., 2001) as well as memory associations (Lau-Barraco & Dunn, 2009), which in turn may influence alcohol use patterns. As such, different environments or contexts engender different cues leading to unique

patterns of drinking behaviors. Similarly, it can be argued that alcohol-related risky sexual behavior differs based on contextual factors associated with specific drinking locations.

In order to compliment research focusing on individual risk factors for alcohol-related risky sexual behavior, research should also consider drinking settings. Focusing on specific localities provides public health practitioners researchers with additional tools to utilize in their efforts to effectively provide health related information and resources (e.g., condoms, attending events with a group of friends that can provide support, knowing and trusting the local bartender or party host, or using environmental strategies to create a low-risk drinking setting, such as responsible beverage service training and low alcohol content beverages). For example, the social context of a bar may be more (or less) strongly associated with the likelihood of risky alcohol-related sexual behavior among college students compared to the context of a party in a residence hall or an off-campus apartment. Unique setting characteristics may exist that increase students' risk for alcohol-related sexual behavior, regardless of drinking behavior or other individual characteristics. Arguably, it would follow to direct resources, intended to support healthy behaviors, to this venue. The current study focused on how college specific drinking settings (Fraternity/Sorority [Greek] parties, residence hall parties, off-campus parties, campus events, bars/restaurants, and outdoor settings) are associated with having sexual intercourse with a stranger as a result of drinking, controlling for individual- and population-level factors.

Drinking Settings, Drinking Behavior, and Drinking-Related Consequences

Several studies have found associations between specific drinking settings and alcohol consumption. For example, a recent survey of students at a California public university found that alcohol consumption among students, both under and of the legal drinking age, was higher if they were drinking in public bars in Mexico versus private parties in the United States. Additionally, a hierarchical regression model predicting alcohol consumption found that the addition of a location variable (public bars or private parties) significantly increased the model's predictive power (Clapp, Reed, Holmes, Lange, & Voas, 2006). A study based on the Canadian Campus Survey, a random sample of 8,864 students from 18 universities in Canada, also examined the relationship between drinking setting and alcohol consumption per drinking occasion. A multi-level analysis found that while individual level-characteristics (e.g., gender) were associated with alcohol intake per occasion, so were situational characteristics (e.g., private settings, bars). Specifically, college students who drank off-campus and at bars/discos were at greater risk for higher levels of alcohol consumption than those who drank on-campus or at home (Demers et al., 2002).

Studies have also examined how drinking settings are associated with negative drinking outcomes. For example, a study based on data from the National Alcohol and Drug Survey of Canadian households found an association between drinking at bars/taverns and self-reported drinking problems. Specifically, respondents who identified themselves as current drinkers were asked if their alcohol use in the past year had caused any problems (e.g., social, physical, financial). Multivariate analyses that controlled for demographic variables and drinking behaviors found that the proportion of total drinking done at bars/taverns and parties/weddings were positively related to total number of alcohol-related problems. Conversely, the proportion of total drinking conducted at home, restaurants, or during recreational activities was not associated with alcohol related problems (Single & Wortley, 1993).

Study Aims and Hypotheses

The current study extends previous research by examining how six different types of drinking settings: Greek fraternity/sorority parties, bars, residence hall parties, campus events (e.g., concert, sporting event), parties at off-campus houses or apartments, restaurants or bars, and outdoor settings (e.g., park, beach), might impact sex with a relative stranger after drinking at those settings in a large sample of college students. Given previous research suggesting a relationship between having sex with a relative stranger and STI's, it is important to examine how individual characteristics are associated with this sexual behavior and examine how unique contexts may impact this behavior. Findings from this research can be used to identify physical locations where prevention efforts can be targeted precisely at the point when risk is present, and reach students who may be at risk, simply as a result of attending a particular venue. In addition, we can train wellness educators to discuss risks that may emerge at specific venues as well as educate individuals who work at high risk venues.

Unlike prior studies, we use within-student, setting-level data to examine relationships between drinking settings and the incidence of having sex with a stranger, controlling for student- and college-level factors that may account for those relationships. We also accounted for potential confounding factors, including frequency of attendance and drinking behavior at each setting, to ensure that effects are a result of setting characteristics and not a simple function of exposure (e.g., young people having a location to congregate, consume alcohol, and meet strangers). We hypothesized that sex with a stranger would be most likely to occur at drinking venues with the lowest level of social controls (e.g., absence of law enforcement, security, residence hall monitors) such as Greek and off-campus parties, and that these differences would remain even after adjusting for student- and college-level characteristics that could influence opportunities for risky alcohol-related sexual behavior.

Method

Procedure

In the fall of 2003, a random sample of 14,280 undergraduates at 14 public California universities, eight from the University of California system and six from the California State University system participated in a web-based or mailed confidential survey. Institutional Review Boards from all participating universities and research institutions approved the human subject protocol. The survey data were collected at baseline as part of a multi-campus intervention study. A simple random sample of 2,000 undergraduate students per college campus was targeted for data collection for a total of 28,000. A "pre-notification" letter informed students of the study. An e-mail invitation followed with a URL that the student could click on to go to a web site that hosted the survey. Additional follow up attempts included two e-mail reminders and a hard copy of the questionnaire sent to their home address. This was followed by a post card and final duplicate questionnaire. On average, the questionnaire took approximately 30 minutes to complete. The electronic and paper versions included identical items, though skip instructions had to be followed on paper whereas the skip logic was built into the web version. Students completed surveys beginning in November and ending in December of 2003. The overall response rate was 51% for a final sample size of 14,280. Students received a \$10 incentive for completing the questionnaire. For the analyses reported here, students were selected if they were between the ages of 18–25, non-married, heterosexual, past-year drinkers, and did not have any missing data for the selected variables at the individual level ($N=7,414$).

Measures

Settings—A series of questions specific to six drinking settings were presented to respondents. The settings were (1) fraternity/sorority parties – Greek parties, (2) residence hall parties, (3) campus events (e.g., concert, sporting event), (4) parties at off-campus houses or apartments, (5) restaurants or bars, and (6) outdoor settings (e.g., park, beach). Students were asked whether and how often they went to each setting since the beginning of the semester, how often they consumed any alcohol, how often they drank enough to get drunk, and possible consequences of drinking for each setting. Thus, each student could provide information for up to six different settings, which created an opportunity to conduct analyses at three levels: setting-level (within-student), student level, and college level. Dummy-coded variables were created to represent the settings. Outdoor setting was selected as the reference group as prevalence of the behavior was lowest at this setting.

Setting Level Variables

Alcohol Related Sex with a Relative Stranger—For each setting, college students were asked to indicate how many times since the beginning of the semester/quarter had they had sex with someone they had just met as a result of drinking. This allowed us to specifically assess how specific drinking settings (e.g., bars, dorm parties) and casual sex behavior might be associated with one another. Six response options ranged from “Never” to “10 or more times.” However, as a result of a skewed distribution and infrequent occurrence of this behavior, a dichotomous measure was created to represent the occurrence of sex with a relative stranger versus non-occurrence.

Frequency of Attendance--Drinking Settings—Students were asked to indicate how many times since the beginning of the semester/quarter had they gone to each of the six settings. The response option was open ended.

Proportion of Times Drunk at Settings—Students were also asked to indicate the number of the times they had attended each setting and how many times they had drank enough to be drunk. This value was then transformed into a proportion based on the total number of times drunk at all settings divided by the total number of times they went to all the settings.

Student Level Variables

Sexual Experience—Students were asked how many people they had sexual intercourse with since the beginning of the school year. Responses ranged from “none” to “10 or more.” A dichotomous measure was created to represent college students with current sexual experience and those without current sexual experience.

Heavy Drinking—Respondents were asked, “Since the beginning of the semester/quarter, how often would you say you drank enough to have been drunk?” Students were given seven possible ascending response options including “never,” “less than once a month,” “one to three times a month,” and “almost every day.” Due to overlap among some of the response categories, some response categories were collapsed, yielding a five-level ordinal heavy drinking measure.

Background Variables—Respondents were asked to provide their age, gender, and race/ethnicity. Given that a positive association exists between white college students and heavy alcohol use (Bersamin, Paschall, & Flewelling, 2005), a dummy variable for being white was created. Students were also asked to indicate their living arrangement. Research shows that Greek residence and living in a co-ed dormitory are correlates of binge drinking

(Wechsler et al., 1995). Therefore, two dummy variables were created to represent students who lived in Greek housing and students who lived in a residence hall (other places of residence; e.g., off-campus apartment/house, at home with parents was the referent category).

In addition, a variable was created to control for issues associated with “time at risk.” For example, one student may complete the survey in October and therefore only be at risk for 30 days while another may complete the survey in December and therefore be at risk for 60 days. The timing variable represents the number of days since participants were asked to participate in the survey and the date the survey was completed.

College Level Variables

College population-level characteristics considered for this study included student population size, percent of students that live on campus, percent of students who were white, and percent of students who were members of a Greek organization. Fall 2003 data for these variables were typically available online, but in some instances were requested from the university’s institutional research office.

Data Analytic Strategy

A multi-level modeling approach was used to examine the unique effects of drinking setting or venue on alcohol-related sexual intercourse with a stranger, controlling for individual and college population-level effects. A three level model allowed us to concurrently model and examine the effects of drinking at specific settings (level 1), individual-level effects, such as gender or overall drinking (level 2) and college population-level variables (percent of college students who live on-campus [level 3]), on alcohol-related sexual behavior with a stranger. Data were analyzed using HLM 6.0 with a logit link to account for the binary outcome. Three data sets were created for each level of the analysis. The first data set (setting level) was created by restructuring the data set from variables into cases. Thus, each drinking location was converted into a case and individual responses to behavior at each drinking setting were associated with that case. The second data set was based on individual student characteristics, and the third data set (college population level) was based on archival data available for each college. A final model was specified that included all of the setting variables: Greek, residence hall, and off-campus parties, bars/restaurants, and campus events. Two additional setting level characteristics were also added - frequency of attending events at that setting and proportion of times one was drunk at the location in order to control for exposure to events and exposure to events while being drunk. We anticipated that the likelihood of meeting a stranger increases as individuals increase their exposure to various settings. Likewise, we expected that risk was higher with increasing frequency of drunkenness at a given setting. By controlling for both these exposure variables, there is greater confidence that a setting is having a unique influence and not just increasing the likelihood of intoxication.

Individual and college level predictors: age, white ethnicity, gender, sexual experience, drinking behavior, timing, and percent of students who live on-campus were also incorporated into the final model. Note however, that initial models included the college level variables: student population, percent white, and percent that are members of a Greek organization, and the individual level variables: dorm and Greek residence. However, preliminary analyses found that these items did not contribute to the model in any significant manner and therefore they were deleted from the final model. The full model is a result of three regression equations being simultaneously modeled. That is, setting-level events or episodes nested within individual student-level variables nested within colleges or:

$$\text{Level 1: } \log\left[\frac{P}{1-P}\right] = P_0 + P_1^*(\text{GREEK}) + P_2^*(\text{RESIDENCE HALL}) + P_3^*(\text{CAMPUS}) + P_4^*(\text{OFFCAMPUS}) + P_5^*(\text{BAR}) + P_6^*(\text{FREQ.OF ATTENDANCE}) + P_7^*(\text{PROPORTION DRUNK AT SETTING}) + R \quad 1$$

$$\text{Level 2: } P_0 = B_{00} + B_{01}^*(\text{AGE}) + B_{02}^*(\text{WHITE}) + B_{03}^*(\text{MALE}) + B_{04}^*(\text{SEXEVER}) + B_{05}^*(\text{DRUNK}) + B_{06}^*(\text{TIME AT RISK}) + R_0 \quad 2$$

$$\text{Level 3: } B_{00} = G_{000} + G_{001}(\text{ONCAMPUS}) + U_{00} \quad 3$$

Results

Attrition Analyses

Based on data provided by the university, we were able to determine whether students who participated in the survey differed from those who did not participate with regards to year in college and gender. No differences emerged with regards to grade level; however, a significantly higher number of women participated in the survey than men. As indicated earlier, the response rate was 51%, however, the response rate varied by institution with a high of 64.6% and a low of 37%.

Preliminary Findings

Table 1 provides an overview of individual-level characteristics of the study population. The sample was 54.4% men, 48.7% white, and 38.1% age 21 and over. A little less than half (43.9%) of students reported not getting drunk since the beginning of the quarter/semester. Conversely, 10.3% reported being drunk once a week or more since the beginning of the quarter/semester. A total of 46.8% of the population reported being sexually active since the beginning of the quarter/semester and 2.2% reported sexual intercourse with a stranger.

Of the six college drinking settings polled, students were most likely to frequent bars/restaurants ($M = 5.81$) since the beginning of the semester (see Table 2). This was followed by off-campus parties ($M = 5.56$) and Greek parties ($M = 5.20$). Results also indicate that heavy drinking occurred at higher percentages of off-campus and Greek parties (36% and 34% respectively). This was followed by dorm parties, bars/restaurants, and outdoor settings. Heavy drinking occurred least frequently at campus events (20%). Alcohol-related sexual intercourse with a stranger occurred at a greater percentage of Greek party events (4%), followed by off-campus (3%), and residence hall parties (3%).

Multi-level Analyses

Setting Level—Results from the HLM analyses indicated that relative to outdoor settings, all settings (with the exception of campus events and bars/restaurants) were positively and significantly associated with the occurrence of alcohol-related sexual intercourse with a stranger (Table 3). Specifically, alcohol-related sexual intercourse with a stranger was ten times more likely to occur after a Greek party relative to an outdoor setting ($OR = 10.09$, $p < .01$). Alcohol-related sexual intercourse with a stranger was four times more likely to occur at or after a residence hall party ($OR = 4.96$, $p < .01$) or an off-campus party ($OR = 4.92$, $p < .01$) relative to an outdoor setting. Frequency of attending the six settings and proportion of times drunk at the settings were also positively associated with alcohol-related sex with a stranger.

Individual Level—Gender, ethnicity, heavy drinking behavior and previous sexual behavior were significantly associated with alcohol-related sexual intercourse with a stranger. Specifically, males ($OR = 1.62$), students who reported being drunk in the past semester/quarter ($OR = 1.61, p < .01$), and those who reported having sexual intercourse in the past semester/quarter ($OR = 23.77, p < .01$) were more likely to report having alcohol related sexual intercourse with a stranger than others. Ethnicity was moderately associated with alcohol related sexual intercourse with a stranger ($OR = .70, p = .03$).

College Level—The percentage of student living on campus was inversely, though modestly, related to the occurrence of alcohol-related sexual intercourse with a stranger such that campuses with a greater number of students living on campus were less likely to report instances of this risky behavior ($OR = .98, p = .02$).

Discussion

A key finding of this study is that drinking settings have a unique influence on alcohol-related risky sexual behavior apart from student-level factors that may predispose individuals to engage in this risky behavior. Specifically, the results indicated that Greek parties, followed by residence hall and off-campus parties are high-risk settings for having alcohol-related sexual intercourse with a stranger relative to other locations. Just as important, this effect persisted even after controlling for several exposure variables: frequency of attending settings and proportion of getting drunk at settings, as well as individual and population level characteristics. These findings are in line with the situation-specificity hypothesis and highlight the impact that environmental cues may have on drinking patterns and behaviors.

The lack of an association between bars/restaurants and alcohol related sexual behavior was unexpected given previous research which found that these venues are significantly associated with high levels of drinking and negative alcohol-related outcomes (Clapp et al., 2006; Demers et al., 2002; Single & Wortley, 1993; Stockwell, Lang, & Rydon, 1993). It is difficult to ascertain whether this apparent discrepancy may be unique to college student drinking, where licensed establishments are “competing” with other venues that may not be so easily available to non-college populations, or perhaps related to the fact that most students are minors (and not legally permitted to drink in bars). Our results may also differ because we were able to separate the exposure variables and drinking within those same settings, which is not common in most other studies.

Finally, although we were not focused on student-level effects here, we note the unsurprising results that gender, sexual experience, and frequency of being drunk increased the odds of sex with a stranger. More interesting, however, we found no significant risk of living in a Greek house (once setting-level variables were included). This suggests that the “risk” of being a member of a Greek organization may not be related to the kind of people attracted to such organizations, but rather to the nature of the parties they host. Many Greek parties are not limited to members of a Greek organization. Indeed, more than half our sample who reported attending such parties was not members themselves. A parallel phenomenon appears for residence hall parties versus living in those halls.

Additional research is necessary to understand why specific drinking settings may influence drinking behaviors as well as negative alcohol-related outcomes. For example, settings may attract individuals with specific shared beliefs and expectations. Individuals with a high level of motivation to participate in sexual intercourse may select one drinking venue over another. These locations may then become known for their “sexual” atmosphere and therefore draw like-minded patrons, resulting in social contexts where drinking and sexual

behavior with strangers are more likely to occur. On a related note, it may be that some drinking venues have low levels of social control (e.g., lack of oversight by responsible adults or monitoring by law enforcement agents), which contribute to alcohol misuse and risky sexual behavior. Perceived peer attitudes and behaviors (i.e., normative beliefs) may also be setting specific and thus contribute to venue effects on behavior through maintenance and/or promotion of risky alcohol-related sexual behaviors. If so, it is not surprising that Greek parties, residence hall and off-campus parties are associated with this risky sexual behavior as these venues are likely to be “invitation-only” or private parties drawing like minded people, and with little or no security and safety monitoring other than that provided by the hosts. Additionally, these locations are all tied to a residence that increases the likelihood of finding or accessing a semi-private “setting” or more candidly a “bed” or bedroom where sexual intercourse can occur. Note, however, that risk is significantly higher at Greek parties in comparison to parties off-campus or at Residence Halls. Campus events and outdoor settings (e.g., park, beach) are public locations with greater degrees of social control which may explain the lower likelihood of alcohol-related sex with a stranger relative to other high risk settings. Additional research is necessary to test these hypotheses and further explore how setting influences drinking related sexual behavior.

The current study focused specifically on one alcohol-related sexual behavior, having sex with a stranger. Although recent research suggest that settings are associated with preloading behavior (Paschall & Saltz, 2007), it is unknown whether drinking venues have similar effects on other risky sexual behaviors. It may be that bars/restaurants are positively associated with condom use as bars are located near retail outlets thereby increasing condom availability. Future research should also investigate how different drinking venues impact a range of high-risk sexual behaviors.

This study has a number of limitations. First, the low response rate raises issues of selection bias and generalizability to the overall college student population. However, a review of survey research by Krosnick (1999) indicates that among probability samples, low response rates do not necessarily translate into an inability to generalize results of a research study or alternatively that high response rates are needed for sample representativeness. Second, all items are based on self-report, and the sensitivity of those items relating to sexual behavior and alcohol use may lead to under-reporting. Likewise, our dependent measure was based on students’ attribution of alcohol use to the occurrence of sex with a stranger. Some students may have engaged in the same risky behavior after drinking, but did not attribute the behavior to drinking.

Third, the degree of risk each individual student experienced is unknown. Due to the wording on the questionnaire, we are unable to determine whether students interpreted “sexual intercourse” to signify oral, vaginal, or anal intercourse, each with different degrees of risk. Similarly, we did not capture condom use. The risk of sexually transmitted disease is decreased significantly when condoms are used. Future studies may want to focus on identifying the degree of risk, both social and emotional, associated with drinking related casual sex by focusing on specific sexual behaviors as well as prophylactic use. Finally, there may be an issue with accuracy of recall, particularly as the behavior was associated with alcohol consumption. Our hope was that the relatively recent time frame (since the start of the semester or quarter) would minimize the likelihood of recall bias.

Despite these weaknesses, a major strength of the study is the research design which allows for event specific analysis. Specifically, measuring the occurrence of drinking related casual sex linked to specific venues. In moving away from global correlations between sex, alcohol

use, and setting, a more comprehensive understanding of the role of location and context on drinking related sexual behavior can be developed.

Taken together, these findings may lead to a broader understanding of the nature of “risk” associated with drinking, and from that, greater appreciation of the value of a more comprehensive set of prevention strategies. As we move from assuming that risk of unsafe sex is limited to the attributes of individuals to specific settings or venues as well, we can give more attention to intervention and prevention strategies that directly impact those settings. For example, the high level of risk associated with Greek parties, independent of individual characteristics, may help universities recognize the need to reduce the occurrence of such parties, take steps to improve safety precautions (e.g. provide condoms, reduce access to private rooms, create social networks to provide support), work with campus and local police to enforce policies that are often violated at these parties (e.g., serving alcohol to underage students, violation of public nuisance ordinance), and educate individuals who work at high risk venues as well as those who attend these locations.

Acknowledgments

The Authors thank Jamie Sullivan for her editorial assistance with this manuscript. This research was supported by a grant from the National Institute on Alcohol Abuse and Alcoholism #R01 AA012516-08.

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Table 1

Descriptive Statistics, student level (N=7414)

Variable	Mean (SD), %
Male, %	54.4%
White, %	48.7%
21 and over, %	38.1%
Prior sexual experience	46.8%
Times drunk since beginning of semester/quarter	.90 (1.00)
Never	43.9%
1 – 5 days this semester/quarter	32.3%
6 – 10 days this semester/quarter	13.5%
Once a week or more	9.9%
Almost everyday	.4%
Reported sexual intercourse with a stranger, %	2.2%
Days to complete survey	64.21 (16.60)

Table 2

Frequency of setting attendance and risky behavior by students, mean (SD)

Setting	Attendance	Drunk	Sex with a relative stranger
Sorority/fraternity parties	5.20 (8.61)	.34 (.40)	.04 (.27)
Residence hall parties	4.28 (7.04)	.31 (.40)	.03 (.37)
Off-campus parties	5.56 (7.77)	.36 (.39)	.03 (.32)
Campus events	2.74 (3.40)	.20 (.37)	.00 (.08)
Bars/restaurants	5.81 (8.03)	.30 (.38)	.01 (.14)
Outdoor settings	3.62 (7.62)	.24 (.40)	.00 (.10)

Table 3

Results of Multi-Level Analysis Predicting Likelihood of Sex with a Stranger, Odds Ratio (95% Confidence Interval)

Fixed parameters	OR	CI
Intercept	0.00	(0.00, 0.00)
<u>Level 1 – setting event level (N = 18623)^a</u>		
Greek	10.09	(4.54, 22.40)
Residence hall	4.96	(2.10, 11.67)
Campus events	0.88	(0.22, 3.49)
Off Campus	4.92	(2.23, 10.86)
Restaurant/Bar	2.04	(0.85, 4.89)
Frequency of attendance -all settings	1.03	(1.02, 1.04)
Proportion of times drunk, all settings	2.93	(1.89, 4.55)
<u>Level 2 – individual level (N = 7414)</u>		
Age (over 21)	0.91	(0.64, 1.30)
White	0.70	(0.50, 0.98)
Gender (male)	1.62	(1.20, 2.20)
Sexual experience	23.77	(10.43, 54.18)
Drunk	1.61	(1.34, 1.94)
Days to complete survey	0.99	(0.97, 1.02)
<u>Level 3 – college level (N = 14)</u>		
% Living on campus	0.98	(0.96, 0.99)

^aThe reference group for all level 1 variables is outdoor settings.