Does Alcohol Contribute to College Men's Sexual Assault Perpetration? Between- and Within-Person Effects Over Five Semesters

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ABSTRACT. Objective: The current longitudinal study was designed to consider the time-varying effects of men's heavy episodic drinking (HED) and drinking setting attendance on college sexual assault perpetration. **Method:** Freshman men (N = 992) were recruited in their first semester and completed online measures at the end of their first five semesters. Using multilevel models, we examined whether men with higher frequency HED (or party or bar attendance) were more likely to perpetrate sexual assault (between-person, Level 2 effect) and whether sexual assault perpetration was more likely in semesters in which HED (or party or bar attendance) was higher than each individual's average (within-person, Level 1 effect). **Results:** The between-person effect of HED on sexual assault was not significant after accounting for the between-person effects of antisocial behavior, impersonal sex orientation, and low self-control. The within-person effect of HED on sexual assault perpetration was not significant. However, models substituting frequency of party attendance or bar attendance revealed both between- and within-person effects. The odds of sexual assault were increased for men with higher bar and party attendance than the sample as a whole, and in semesters in which party or bar attendance was higher than their own average. Supplemental analyses suggested that these drinking setting effects were explained by hookups, with sexual assault perpetration more likely in semesters in which the number of hookups exceeded one's own average. **Conclusions:** Findings point toward the importance of drinking contexts, rather than drinking per se, as predictors of college men's sexual assault perpetration. (*J. Stud. Alcohol Drugs, 78,* 5–13, 2017)

ALCOHOL IS BELIEVED TO PLAY a significant role in college sexual assault, with half of sexual assault incidents occurring when the perpetrator, the victim, or both have been drinking (Abbey, 2002, 2011). College women's heavy episodic drinking (HED) increases risk for sexual assault victimization, particularly incapacitated rape (Mohler-Kuo et al., 2004; Parks et al., 2008; Testa & Livingston, 2009). Because men and women drink together, men's drinking may also contribute to sexual assault; however, evidence has been limited. The current study examined the independent role of college men's drinking on sexual assault perpetration over the first five semesters of college. We considered whether men's HED predicts sexual assault perpetration (between-person effect) independent of whether time-varying HED predicts when risk of perpetration is elevated (within-person effect). Similarly, we considered the between- and within-person effects of drinking contexts (parties, bars) on sexual assault.

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Effects of alcohol on sexual assault perpetration

Men's HED is thought to contribute to sexual assault perpetration via alcohol's acute, pharmacological effect on physical and sexual aggression (see Crane et al., 2015; Ito et al., 1996, for reviews of this experimental literature). This acute effect is consistent with the Alcohol Myopia Model (see Giancola et al., 2010), which posits that intoxication narrows attention to more salient, typically instigatory cues (e.g., sexual arousal, Simons et al., 2016), while impairing the ability to attend to less salient inhibitory cues (e.g., woman's reluctance). In natural drinking settings, pharmacological effects may be enhanced by alcohol expectancy effects (Abbey, 2011), i.e., the belief that alcohol enhances sex (George et al., 2000) and that drinking women are more interested in sex (George et al., 1995).

Consistent with these presumed mechanisms, cross-sectional studies reveal a positive association between college men's drinking and sexual assault perpetration (Abbey, 2011; Abbey et al., 2014). Compared with nonperpetrators, perpetrators drink more heavily (Koss & Gaines, 1993; Locke & Mahalik, 2005; Tuliao & McChargue, 2014) and more frequently within dating and sexual situations (Abbey et al., 2001; Schwartz et al., 2001). Although the positive association between drinking and sexual assault is consistent with a pharmacological effect, heavy drinking men also possess characteristics associated with sexual assault perpetration (e.g., impulsivity, delinquency; Abbey et al., 2006; Thompson et al., 2011). Within the influential Confluence Model

(Malamuth et al., 1991; 1995), sexual assault perpetrators are characterized by impersonal sexuality (promiscuity) and hostile masculinity, robust predictors of sexual assault both independently (Abbey & McAuslan, 2004; DeGue & DiLillo, 2004; Murnen et al., 2002) and synergistically (Jacques-Tiura et al., 2007). Men's alcohol use adds modest predictive power to the Confluence Model (Abbey et al., 2006; Parkhill & Abbey, 2008). For example, Abbey et al. (2011) found an indirect effect of HED on sexual assault via increased impersonal sex and sexual misperception.

Identifying men at risk for sexual assault is important for targeting sexual assault prevention. However, few studies have used longitudinal designs to determine whether college men's drinking increases the risk of later perpetration. Gidycz and colleagues (2007) found a relationship between baseline HED and later perpetration that became nonsignificant after accounting for prior sexual assault. Abbey and McAuslan (2004) found that college students who perpetrated at more than one point in time were heavier drinkers than those who perpetrated only once or not at all. A third longitudinal study failed to find either a prospective or a cross-sectional relationship (Loh et al., 2005).

In a prospective study of college men, Thompson et al. (2011) found an indirect effect of Time 1 (T1) HED on T2 sexual assault mediated via T1 perceived peer norms supporting sexual aggression. A subsequent path model revealed that T1 HED predicted T3 sexual assault via T2 fraternity membership, T2 peer norms supportive of sexual aggression, and T2 HED (Kingree & Thompson, 2013). Taken together, analyses suggest indirect effects of HED on sexual assault via drinking contexts and social networks that facilitate perpetration. Person-centered analyses were used to predict high, increasing, and decreasing trajectories of perpetration relative to no sexual assault over all 4 years. Changes in sexual assault over time were associated with changes in impulsivity, sexual compulsivity, peer norms, and hostile masculinity but not with changes in drinking (Thompson et al., 2013; 2015). However, men who never perpetrated drank less than men with increasing, decreasing, or high perpetration trajectories (i.e., there was a between-person effect of HED on sexual assault) (Thompson et al., 2015).

Effect of drinking settings on sexual assault perpetration

The indirect effects of HED on sexual assault via fraternity membership and peer norms (Kingree & Thompson, 2013) and via sexual misperception and impersonal sex (Abbey et al., 2011) suggest the potential importance of drinking settings. HED cannot lead to sexual assault unless it occurs in a context in which a potential victim is present. College students typically drink at parties and bars (Clapp et al., 2006; Harford et al., 2002), settings that facilitate sexual activity and attract people seeking to "hook up" (Norris et al., 1996; Owen et al., 2011). These settings include women who are sexually vulnerable because of their intoxication (Graham et al., 2014; Testa & Livingston, 2009) and may offer peer support for sexual aggression (Swartout, 2013). Not surprisingly, college women's party attendance is associated with sexual victimization (Cranney, 2015; Franklin et al., 2012). Similarly, frequency of attending bars increases women's risk of sexual victimization independent of drinking (Pino & Johnson-Johns, 2009), and men frequently make sexual advances toward women in bars (Thompson & Cracco, 2008). Men's attendance at parties and bars may increase the risk of sexual assault. However, to our knowledge, the effects of drinking setting on sexual assault perpetration previously had not been examined.

Present study

The current study examined the role of men's alcohol use on sexual assault perpetration over five semesters of college. Most previous studies have used a between-participant approach to examine whether heavier drinking men are more likely to perpetrate sexual assault. However, multilevel models with repeated measures permit disaggregating within-person from between-person effects (Curran & Bauer, 2011), allowing testing of the hypothesis that sexual assault will be more likely during semesters in which men drink more than their average amount relative to semesters of less-than-average drinking (i.e., a within-person effect). A positive within-person effect of HED on sexual assault perpetration indicates that changes in HED coincide with the odds of sexual assault, independent of the association of sexual assault with being a heavier drinker (i.e., the between-person effect). Because the settings in which alcohol is consumed are also associated with sexual assault, we considered the effects of party and bar attendance as independent between- and within-person predictors, hypothesizing positive associations for both effects.

We hypothesized that men who reported more frequent HED, on average, would have increased odds of sexual assault perpetration over time (a between-person effect). We included as between-person covariates individual difference variables associated with sexual assault perpetration: impersonal sex orientation, hostility toward women, antisocial behavior (Abbey & Jacques-Tiura, 2011; Abbey & McAuslan, 2004), and self-control, which is negatively associated with aggression in a variety of contexts (DeWall et al., 2011). These covariates allowed us to determine whether there is a between-person effect of drinking or drinking settings independent of personality factors.

Method

Participants and procedures

All procedures were approved by the university's institutional review board. Participants included 994 freshman men

who entered a large Northeastern public university in fall 2011. Sample composition was 72.2% White; 3.9% African American; 5.2% Hispanic; 14.6% Asian American; and 4.1% mixed, other, or not reported, slightly overrepresenting White students from the class of 2011 overall (65.5% White). Most lived on campus (67.0%), slightly less than the proportion for all freshmen (74.0%).

Participants were recruited by email to participate in a study of college men's behaviors and attitudes over five semesters of college. All first-semester freshman men who resided in the United States, allowed their university email address to be included in the student directory (about 85% of the class), and were 18 or 19 on November 1, 2011, were invited. Nonresponders were sent up to five email reminders and a letter to their permanent address at Thanksgiving. Email invitations included a link to a secure site, which required that participants provide a student ID number to enter. After providing online informed consent, respondents were directed to the 30-minute survey. On completion, they were asked to provide contact information (preferred email address, phone number). The response rate for the initial recruitment was 68.9% (994 / 1,442).

For the next four semesters, in November or April, participants were sent a similar email invitation containing a link to the survey, followed by up to five email reminders and phone calls, if necessary. Men were able to continue participation if they left the university; however, such men accounted for no more than 8% of the participants (at T5).

The participants were compensated $25 in Campus Cash (or check) for completing Waves 1, 3, and 5 and $10 for completing the briefer spring semester surveys at Waves 2 and 4. To encourage completion, each semester there was a lottery in which one student was selected to win $400.

Measures

Time-varying indicators of HED, sexual assault perpetration, bar and party attendance, and hookups were assessed each semester (T1–T5). Between-person indicators (self-control, antisocial behavior, impersonal sex orientation, hostility toward women) were assessed at T1.

Sexual aggression perpetration. This variable was assessed using a 16-item version of the Sexual Experiences Survey (SES) that measures unwanted contact, attempted intercourse, and intercourse using verbal, physical force, and incapacitation tactics (Abbey et al., 2007; Testa et al., 2015a). Men were asked how many times they had done each behavior over the past semester (*never, once,* or *2 or more times*). They were classified as perpetrators if they reported one or more items.

Heavy episodic drinking. HED was assessed with the item, "During the past semester, how often did you drink 5 or more drinks in a row in a single occasion (e.g., in the same evening)?" Seven response categories ranged from 0 (*never*) to 6 (*3 or more days per week*). Students who indicated in response to an earlier question that they never drank skipped the questions and were assigned a 0.

Bar and party attendance. Men were asked, "During the past semester, how often did you attend a party?" and ". . . how often did you go to a bar or club?" Frequency was assessed using the same 7-point scale used to assess drinking.

Hookups. Respondents were provided the definition of a hookup ("a romantic or sexual encounter between two people who are strangers, friends, or acquaintances. Some physical interaction is typical but it may or may not involve sexual intercourse") and asked how many hookups they had had in the past semester. At Waves 1 and 3, hookups were assessed with an open-ended scale and responses were Winsorized to the 95th percentile (Reifman & Keyton, 2010). At others waves, hookups were assessed with a 6-point scale ranging from 0 to 5 or more.

Self-control (T1). This variable was assessed using the 13-item Brief Self-Control Scale (Tangney et al., 2004). Items (e.g., "Sometimes I can't stop myself from doing something even if I know it is wrong") were assessed on 5-point scales ranging from 1 (*not at all*) to 5 (*very much*) and summed (α = .82).

Antisocial behavior (T1). Antisocial behavior was assessed using the 18-item Antisocial Behavior Checklist, adolescent version (Zucker, 2005), which includes items such as "cursed at a teacher," "skipped school," or "beat someone up." Four response options included *never, rarely, sometimes,* and *often.* Responses were assigned scores from 0 to 3 and summed (α = .82).

Hostility toward women (T1). This scale consisted of 10 items such as, "I am easily angered by women" and "I feel that many times women flirt with men just to tease them or hurt them" (Lonsway & Fitzgerald, 1995). These were rated on 7-point scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and summed (α = .84).

Impersonal sex (T1). This composite variable was based on the Sociosexuality Index (Simpson & Gangestad, 1991). Three items assessed attitudes toward impersonal sex (e.g., "sex without love is okay"), using 9-point scales ranging from 1 (*strongly disagree*) to 9 (*strongly agree,* α = .79). The number of lifetime sex partners and the number of partners desired in the next 5 years were assessed using open-ended responses and then were Winsorized (to 95th percentile, Reifman & Keyton, 2010) to reduce outliers. Men were asked, "How often do you fantasize about having sex with someone (other than your current dating partner if you have one)?" using a 7-point scale (0 = *never,* 6 = *at least once a day*). The four components (lifetime and 5-year sex partners, sexual fantasies, impersonal sex attitudes) were standardized and combined (α = .71).

Analytic strategy

Because the outcome variable was a dichotomous measure (sexual assault perpetration each semester), a series of hierarchical generalized linear models were estimated to examine the effects of HED on repeated measures of sexual assault perpetration across the five semesters. Following established recommendations (Raudenbush & Bryk, 2002), the between-person predictors (measured at T1) were centered on the sample mean (i.e., grand-mean centered) to provide between-person effects of these covariates. The time-varying predictors were centered on each individual's overall mean (i.e., person-mean centered) to provide a within-person effect (Level 1). Each individual's overall mean value was also centered on the grand mean to provide a between-person effect (Level 2) for each time-varying predictor.

The resulting models specified a binomial distribution and a logit link function to estimate the odds of sexual assault perpetration each semester. We tested hypotheses by estimating three separate generalized linear mixed models. Model A included only the between-person effects of HED. Model B also included between-person effects of self-control, antisocial behavior, impersonal sex, and hostility toward women. Model C added the within-person effects of HED. Thus, the hierarchical logistic model estimated in Model C can be expressed as follows:

Level 1 (within-person) model:

$$logit\ (SA)_{it} = \beta_0 + \beta_{1i} HED_{it} + e_{it}$$

Level 2 (between-person) model:

$$\beta_{0i} = \gamma_{00} + \gamma_{01} HED_i + \gamma_{02} Time1\ Covariates_i + u_{0i}$$

$$\beta_{1i} = \gamma_{10}$$

To test hypotheses regarding effects of drinking settings, the three modeling steps described above were repeated with the between-person and within-person effects of party attendance and bar attendance replacing HED effects. All models were estimated with SAS Proc Glimmix (SAS Institute Inc., Cary, NC) using the adaptive quadrature approach, the recommended estimation procedure for hierarchical generalized linear models (Hedeker, 2015). To take advantage of full information maximum likelihood (FIML) for missing data (Enders & Bandalos, 2001; Larsen, 2011), means, variances, and covariances of predictors with missing data were estimated. FIML addresses missing data by computing parameter estimates and standard errors using all available information from partially missing cases and produces less biased and more efficient results than listwise deletion (Graham, 2009).

Results

Retention

Of 994 men who completed the T1 survey, 2 had missing data on all 16 SES items and were dropped from subsequent analyses. Of the remaining 992, 786 completed T2, 738 completed T3, 625 completed T4, and 658 completed T5. Nearly 90% completed at least two waves of data and 77.6% completed three or more waves. Subsequent analyses revealed that the data were not missing completely at random, $\chi^2(229) = 424.60$, $p < .001$ (Little, 1988). However, univariate *t* test comparisons revealed that the likelihood of missing data on the sexual assault perpetration measures was significantly associated with three of the four T1 covariates (self-control, antisocial behavior, and impersonal sex) but not with T1 sexual assault perpetration or hostility toward women. Inclusion of these variables in all subsequent analyses allowed us to meet the missing-at-random assumptions that underlie FIML estimation techniques (Enders, 2010).

Table 1. Comparison of sexual assault perpetrators and nonperpetrators on Time 1 (T1) variables

Variable	Nonperpetrators (n = 817) M (SD)	Perpetrators (n = 175) M (SD)
T1 HED Frequency	1.73 (1.89)	2.54 (2.08)
T1 Party Frequency	2.37 (1.88)	3.16 (1.86)
T1 Bar Frequency	0.78 (1.25)	1.38 (1.70)
T1 Number of Hookups	1.21 (2.04)	2.01 (2.35)
T1 Sex Partners, Lifetime	1.45 (1.89)	2.16 (2.14)
T1 Sex Partners Desired	4.84 (5.32)	6.86 (6.41)
T1 Antisocial Behavior	6.16 (4.64)	9.11 (7.81)
T1 Self-Control	43.55 (8.00)	39.54 (7.59)
T1 Hostility Toward Women	33.06 (10.21)	35.91 (9.89)

Notes: Perpetrators reported sexual assault in one or more semesters. HED = heavy episodic drinking. All bivariate group comparisons were significant at $p < .001$ or greater.

Descriptives

The proportion of men who reported any sexual assault (positive response to at least one SES item) was 5.9% at T1, 7.0% at T2, 9.5% at T3, 6.6% at T4, and 9.3% at T5. Of 992 men, 175 (17.6%) reported sexual assault in at least one semester (106 perpetrated it in one semester, 44 in two semesters, and 25 in three or more). As shown in Table 1, men who perpetrated sexual assault differed significantly from those with no sexual assault on all key T1 variables. All variables in the table were positively and linearly associated with whether perpetration occurred in zero, one, two, or three or more semesters, all ps < .001. T1 correlations among predictors are presented in Table 2. The frequencies of HED, party attendance, and bar attendance were highly correlated at this and other waves (rs range: .43–.82), supporting our decision to examine the effects of the three alcohol variables in separate models.

Twenty-eight men reported on at least one survey that they perpetrated all 16 SES items. Although this seemed implausible and suggested frivolous responding, we believed it likely that they had perpetrated some sexual assault. Men with this unusual response pattern did not differ from other perpetrators on key variables, and 15 of 28 (54%) reported perpetrating in

Table 2. Correlations among Time 1 (T1) variables

Variable	Heavy episodic drinking	Hostility toward women	Self-control	Antisocial behavior	Impersonal sex, composite	Frequency parties	Frequency bars	Frequency hookups
Heavy episodic drinking	1							
Hostility toward women	.184**	1						
Self-control	-.288**	-.257**	1					
Antisocial behavior	.317**	.179**	-.414**	1				
Impersonal sex, composite	.485**	.283**	-.285**	.360**	1			
Frequency of parties	.780**	.170**	-.248**	.304**	.514**	1		
Frequency of bars	.426**	.130**	-.146**	.218**	.358**	.520**	1	
Frequency of hookups	.407**	.135**	-.190**	.204**	.508**	.460**	.402**	1
Any sexual assault perpetration (yes/no)	.144**	.086*	-.168**	.210**	.174**	.144**	.121**	.140**

*$p < .01$; **$p < .001$.

at least one other semester. We retained these men; however, removing them from analyses did not alter results.

Preliminary model

Preliminary unconditional models revealed a small, linear increase in sexual assault over time ($b = 0.18$, $p < .001$) but no evidence for a quadratic effect. Thus, a random intercept and a fixed linear slope term were included in all models. Participants were more likely to report sexual assault on long-form fall surveys compared with short-form spring surveys; hence, a dummy-coded variable (0 = *fall,* 1 = *spring*) was included as a main effect in all models. All models also included an indicator of the participants' relationship status (0 = *no,* 1 = *yes*) reported each semester.

Model building to test hypotheses

Results of the series of hierarchical generalized linear models are presented in Tables 3–5. In each table the estimated binary logistic regression coefficients are presented along with the corresponding standard errors; these represent the log odds of reporting sexual assault perpetration for a 1-unit increase in the predictor variable. For ease of interpretation, the associated odds ratios (ORs) for each predictor are also provided. Table 3 displays the results for the within- and between-person effects of HED on sexual assault perpetration. Model A revealed, as hypothesized, that sexual assault was more likely among men who reported more frequent HED than the sample as a whole (between-person effect, OR = 1.51). However, HED was not significant after adding the T1 covariates in Model B, which indicated between-person effects of self-control (OR = 0.94), antisocial behavior (OR = 1.07), and impersonal sex orientation (OR = 1.70) in the expected directions. The within-person effect of HED, added in Model C, was not significant.

Table 4 displays results substituting frequency of party attendance for the within- and between-person effects of HED. The positive between-person effect of party attendance remained significant in Model B after controlling for T1 covariates (OR = 1.30). The results of Model C indicated that the within-person effect of frequency of party attendance was also significant (OR = 1.15). Thus, sexual assault perpetration was more likely to occur in semesters in which frequency of party attendance was higher than one's own average and among students who, on average, reported more frequent party attendance than the sample as a whole. The results for frequency of bar attendance (Table 5) were nearly identical to those for party attendance.

Supplemental analyses

To better understand how drinking settings contribute to sexual assault perpetration, we considered the role of hookup frequency in the party and bar models, reasoning that these casual sexual encounters may explain the link (e.g., Flack et al., 2007). Thus, we added Model D, which included the between- and within-person effects of frequency of hookups, to Tables 4 and 5. When added to either the party or the bar frequency model, the within-person effect of hookups was significant (OR = 1.12 in both models), whereas the within-person effect of party and bar attendance became nonsignificant. The between-person effect of hookups was significant in the party model (OR = 1.27) but not significant in the bar model. After controlling for hookups, the between-person effect of bar frequency remained significant (OR = 1.61), whereas the effect of party frequency was not.

Discussion

College men with higher frequency HED were more likely to perpetrate sexual assault over the first five semes-

TABLE 3. Results of hierarchical generalized linear models with heavy episodic drinking as a predictor of sexual assault perpetration across the five semesters

	Model A			Model B			Model C		
Variable	*b*	(*SE*)	OR	*b*	(*SE*)	OR	*b*	(*SE*)	OR
Level 2 (BP effects)									
Heavy alcohol use	0.41**	(0.08)	1.51	0.13	(0.08)	1.13	0.13	(0.08)	1.13
Hostility toward women				0.01	(0.01)	1.01	0.01	(0.01)	1.01
Self-control				-0.06***	(0.02)	0.94	-0.06***	(0.02)	0.94
Antisocial behavior				0.07**	(0.02)	1.07	0.07**	(0.02)	1.07
Impersonal sex				0.53**	(0.19)	1.70	0.53**	(0.19)	1.70
Level 1 (WP effects)									
Heavy alcohol use							0.07	(0.07)	1.07
Goodness-of-fit indices									
AIC		1,732.28			1,684.70			1,685.78	
BIC		1,761.68			1,733.70			1,739.68	

Notes: b = logistic regression coefficient; OR = odds ratio; BP = between-person; WP = within-person; AIC = Akaike information criterion; BIC = Bayesian information criterion. All models include five semesters, nested within 992 participants.
**$p < .01$; ***$p < .001$.

ters of college. However, this between-person effect was completely explained by characteristics shared by heavier drinkers and perpetrators—impersonal sex orientation, antisocial behavior, and low self-control. The absence of an independent between-person effect of HED is consistent with the results of previous studies that have found weak or nonsignificant effects of men's alcohol use on perpetration relative to strong effects of personality variables (Parkhill & Abbey, 2008; Thompson et al., 2013; 2015). In contrast, when we substituted frequency of party or bar attendance for HED, we found independent, between-person effects, indicating that men who frequent these settings more than average are at a higher risk for perpetrating sexual assault over time.

We also failed to support the hypothesis that sexual assault would be more likely to occur in semesters in which HED was more frequent than one's own average. However, we found within-person effects for party and bar frequency on sexual assault, with a higher risk in semesters in which attendance exceeded one's own average frequency. College students, aware of the strong link between drinking, drinking settings, and sexual assault, attend parties and bars to drink and find sex partners (Lindgren et al., 2009; Norris et al., 1996). Predatory men may seek out these settings to target vulnerable, intoxicated women for sexual advances (Graham et al., 2014; Mumford et al., 2011). Accordingly, when we entered time-varying hookup behavior, the within-person effects of party and bar attendance became nonsignificant, as hookups emerged as a significant predictor of sexual assault. Consistent with research linking hookups with sexual aggression (Flack et al., 2007; Testa et al., 2015b), casual sexual behavior may be an even more proximal driver of sexual assault than drinking settings.

Limitations

Because these are not event-level data, we do not know whether within-person effects reflect perpetration occurring

TABLE 4. Results of hierarchical linear modeling with party attendance as a predictor of sexual assault perpetration over five semesters

	Model A			Model B			Model C			Model D		
Variable	*b*	(*SE*)	OR	*b*	(*SE*)	OR	*b*	(*SE*)	OR	*b*	(*SE*)	OR
Level 2 (BP effects)												
Frequency of going to parties	0.51***	(0.08)	1.67	0.26**	(0.09)	1.30	0.26**	(0.09)	1.30	0.15	(0.09)	1.17
Frequency of hookups										0.24*	(0.10)	1.27
Hostility toward women				0.01	(0.01)	1.01	0.01	(0.01)	1.01	0.01	(0.02)	1.01
Self-control				0.06***	(0.02)	0.94	-0.06***	(0.02)	0.94	-0.06***	(0.02)	0.94
Antisocial behavior				0.06**	(0.02)	1.06	0.06**	(0.02)	1.06	0.06**	(0.02)	1.06
Impersonal sex				0.40*	(0.19)	1.49	0.41*	(0.19)	1.50	0.22	(0.20)	1.25
Level 1 (WP effects)												
Frequency going to parties							0.14*	(0.07)	1.15	0.13	(0.07)	1.14
Frequency of hookups										0.11*	(0.05)	1.12
Goodness-of-fit indices												
AIC		1,719.45			1,679.53			1,677.39			1,656.12	
BIC		1,748.85			1,728.52			1,731.29			1,719.81	

Notes: b = logistic regression coefficient; OR = odds ratio; BP = between-person; WP = within-person; AIC = Akaike information criterion; BIC = Bayesian information criterion. All models include five semesters, nested within 992 participants.
*$p < .05$; **$p < .01$; ***$p < .001$.

Table 5. Results of hierarchical linear modeling with bar attendance as a predictor of sexual assault perpetration over five semesters

	Model A			Model B			Model C			Model D		
Variable	*b*	(*SE*)	OR	*b*	(*SE*)	OR	*b*	(*SE*)	OR	*b*	(*SE*)	OR
Level 2 (BP effects)												
Frequency of going to bars	0.81***	(0.11)	2.25	0.56***	(0.11)	1.75	0.56***	(0.11)	1.75	0.48***	(0.11)	1.61
Frequency of hookups										0.15	(0.09)	1.16
Hostility toward women				0.01	(0.01)	1.01	0.01	(0.01)	1.01	0.01	(0.01)	1.01
Self-control				-0.06***	(0.02)	0.94	-0.06***	(0.02)	0.94	-0.06***	(0.02)	0.94
Antisocial behavior				0.06**	(0.02)	1.06	0.06**	(0.02)	1.06	0.06**	(0.02)	1.06
Impersonal sex				0.28	(0.18)	1.32	0.29	(0.18)	1.33	0.17	(0.20)	1.19
Level 1 (WP effects)												
Frequency of going to bars							0.16*	(0.07)	1.18	0.13	(0.07)	1.13
Frequency of hookups										0.11*	(0.05)	1.12
Goodness-of-fit indices												
AIC		1,696.39			1,660.21			1,656.70			1,641.05	
BIC		1,725.79			1,709.21			1,710.59			1,704.74	

Notes: *b* = logistic regression coefficient; OR = odds ratio; BP = between-person, WP = within-person; AIC = Akaike information criterion; BIC = Bayesian information criterion. All models include five semesters, nested within 992 participants.
*$p < .05$; **$p < .01$; ***$p < .001$.

within drinking settings (or hookups) or on separate occasions within the same semester. There are always limitations associated with self-report data; these may be relatively more significant for assessment of sexual assault perpetration, a socially proscribed behavior. Although the SES is a standard, widely used measure, there has been little psychometric evaluation of its validity (Kolivas & Gross, 2007). Because personality variables were not assessed at all waves, we were unable to model their time-varying effects on sexual assault (see Thompson et al., 2015). Finally, although we had good retention in this large sample, it is possible that missing data influenced the results in unknown ways.

Implications for preventing college sexual assault

Consistent with Thompson et al. (2015), sexual assault perpetration did not decline over the course of college. Yet, the risk of sexual assault victimization among women declines from a peak in the first year (Humphrey & White, 2000; Parks et al., 2014). Because this pattern suggests that upperclassmen may be targeting vulnerable freshman women, sexual assault prevention efforts need to include these older men.

Although we did not find an independent between- or within-person effect of HED on sexual assault, heavier drinkers were more likely to perpetrate over the next several semesters than lighter drinkers. Because heavy drinkers are potentially identifiable (e.g., mandated for intervention), it may be feasible to provide them with sexual assault prevention programming (see Orchowski et al., 2016), although our results do not imply that reducing men's HED in itself will prevent sexual assault perpetration. The between- and within-person effects of party and bar attendance are consistent with a growing body of research pointing toward drinking settings as "hot spots" for sexual victimization (e.g., Bersamin et al., 2012; Graham et al., 2014). The choice to frequent these settings reflects not only the desire to drink but also personality characteristics, expectancies about alcohol within these settings, and desire to have sex or possibly to use sexually aggressive tactics to obtain sex (Mumford et al., 2011). Although eliminating college parties and bars seems unrealistic, it may be possible to make these social settings safer (e.g., Glindemann et al., 2007)—for example, through server or bystander intervention training (e.g., Salazar et al., 2014).

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