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It's not just drinking, but where you drink: A daily diary study of drinking venue effects on sexual activity with new partners

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ABSTRACT

It is well established that young adults' drinking is positively associated with sexual activity with new partners. While pharmacologic effects of alcohol (e.g., impaired sexual decision-making) can contribute to sexual activity with new partners, the context in which alcohol is consumed may also be important. We tested the hypothesis that drinking venues such as parties and bars increase the likelihood of sexual activity with new partners beyond any pharmacological effects of drinking quantity. Participants were 427 first-year men (aged 18–19). They reported on their relationship status and sociosexuality (i.e., attitudes/behaviors related to casual sex) at baseline and completed daily diary reports of drinking events (including number of drinks and venue) and sexual activity with new or previous partners over the span of 56 days. Drinking events at parties/bars (but not at home) increased the odds of sexual activity in the next four hours with new partners (but not with previous partners), even after controlling for the number of drinks consumed. Parties/bars are an integral part of facilitating sexual activity with new partners, and have effects *independent* of pharmacological alcohol effects, which has implications for reducing alcohol-related risky sexual activity. Interventions should not only target alcohol consumption, but where consumption takes place.

1. Introduction

There is a well-established association between drinking and casual sex among young adults (Claxton et al., 2015; Goldstein et al., 2007; Kiene et al., 2009; Cooper, 2002). Drinking is thought to facilitate casual sex (Dermen et al., 1998; Lindgren et al., 2009; Vander Ven and Beck, 2009; Lefkowitz et al., 2016), and most hookups occur after alcohol use (Garcia, 2019). Alcohol challenge studies show that the pharmacological effects of alcohol on cognitive processes (e.g., disinhibition, impaired judgment) related to riskier sexual decision-making may contribute to the increased likelihood of sex (Garcia, 2019; Norris, 2009; Davis et al., 2004; Abbey, 2002; Berry and Johnson, 2018). We argue that it's not just drinking, but also *where* one drinks that impacts sexual activity with new partners (SANP). SANP (compared to sexual activity with previous partners; SAPP) is associated with fewer intimate behaviors (i.e., penetration, oral sex, sexual touching), but more drinking before sex, verbal persuasion, physical force, intentional intoxication, encouragement to drink, and sexual aggression (Testa, 2015). SANP is also uniquely related to individual differences. For example, antisocial behavior and hostility towards women are both positively related to reports of SANP involving some verbal persuasion, physical force, or encouragement to drink (Testa, 2015), and sociosexuality (i.e., attitudes and behaviors related to casual sex) is related to SANP (Hone et al., 2020). The present daily diary study considers the impact of drinking venues independent of the effects of drinking quantity on SANP. Here, we test whether drinking venue effects exist on sexual activity with new—but not previous—partners, and whether these effects exist even after accounting for the intoxicating effects of alcohol that may be present for men during those hours.

Young adults consume alcohol both in public (e.g., parties) and in private (e.g., home) venues, and the venue in which a drinking event occurs predicts the amount of alcohol consumed (Ehlke et al., 2019), with more alcohol being consumed in public, compared to private venues (Clapp, 2006). Moreover, heavier drinking at bars (compared to parties, campus events, and dorms) is associated with unprotected sex among men, but not women, suggesting there are also gender-specific effects of drinking venues on sexual outcomes (Mair et al., 2016). But research using event-level methodology suggests the association between drinking and SANP is not solely dose-dependent on the intoxicating effects of alcohol in the moment (Testa, 2015; Mair et al., 2016;

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Bersamin, 2012; Howells and Orcutt, 2014). For example, frequency of attending Greek parties, residence-hall parties, and off-campus parties (relative to other drinking contexts) was related to increased risk of alcohol-related sex with a stranger, controlling for frequency of getting drunk in such contexts (Bersamin, 2012). Similarly, frequency of drinking at parties and bars was related to having more sexual partners, controlling for quantity of alcohol consumed (Mair et al., 2016). Moreover, drinking episodes (venue unspecified) increase the odds of (both aggressive and non-aggressive) SANP (Testa, 2015). Of note, drinking episodes involving alcohol consumption at doses below the level required to produce pharmacological effects of alcohol (<2 drinks) still increased the odds of SANP (Testa, 2015), suggesting there are situational, and not just pharmacological, effects of alcohol on SANP that have yet to be examined.

The notion that drinking venues play a role in SANP is not new. Global studies have consistently revealed an association between drinking in bars and victimization (Parks and Zetes-Zanatta, 1999), and are useful in identifying potential high-risk targets for SANP interventions. But it remains unclear whether drinking at parties and bars increases the likelihood of subsequent sex with new partners in the next few hours, or merely whether those who drink more in these contexts are also more likely to have more sex with new partners on separate occasions (i.e., reflecting a pattern of high-risk behavior) (Parks and Zetes-Zanatta, 1999). Early event-based studies of sexual and nonsexual aggression in bars revealed that venues potentiate risk (Parks, 2000). Because SANP does not occur after every drinking event, event-based studies enable researchers to pinpoint differences between instances when SANP occurred versus times when it did not (e.g., if/where prior drinking occurred). For example, recent daily survey research suggests differences between instances when (nonconsensual) SANP occurred among college women versus when it did not can be attributed to contextual risk (i.e., exposure to potential sex partners (Blayney et al., 2022).

Here we similarly consider college men's drinking events at parties and bars versus at home (venues that vary regarding how many women are present, and perceived level of women's intoxication), as well as the number of drinks men consumed, and SANP within the next four hours. Because SANP is associated with negative consequences like sexual aggression (Garcia, 2019; Perkins et al., 2002), deducing whether venues might potentiate risks beyond level of intoxication has the potential to inform prevention programs. In addition to targeting and reducing average drinking, we might also target social drinking venues that are hot spots for meeting potential new sex partners, and individuals (especially men; Treat et al., 2021) who frequent these venues for tailored interventions (Saltz et al., 2010).

Earlier analyses of the present dataset (conducted to examine the role of sociosexuality—attitudes and behaviors related to casual sex—in drinking at parties/bars to facilitate new partner sex) revealed that men who reported a greater total number of drinking events at parties/bars across a 56-day reporting period also reported a greater total number of SANP events throughout the study (Hone et al., 2020). However, it is unclear whether this global association reflects an event-specific effect of drinking at parties/bars on increased likelihood of subsequent SANP in the next few hours. Because the primary goal of prior analyses was to evaluate the role of sociosexuality in drinking at parties/bars to facilitate SANP, whether venue effects were independent of the intoxicating effects of alcohol has not yet been examined. Prior research suggests that drinking quantity influences the likelihood of SANP, so we controlled for the effects of number of drinks consumed to address this limitation. In doing so, we elucidate whether it's *just* drinking (i.e., number of drinks consumed), or perhaps also *where* these high-risk men drink that contributes to SANP.

The present daily diary study tested whether drinking in certain venues increases the odds of certain types of sexual activity in the next four hours, independent of alcohol quantity consumed. To answer our questions of interest regarding drinking venues and sexual activity, we deliberately limited the sample to men likely to have incidents of drinking and sex, as men reporting no drinking or sex would add no variance. Based on prior research highlighting the importance of relationship status (Simpson et al., 2004; Simpson and Gangestad, 1992) and sociosexuality (i.e., attitudes and behaviors related to casual sex; Hone et al., 2020; Simpson and Gangestad, 1991) in sexual activity, we include men's relationship status and sociosexuality in our models. The 4-hour window was chosen to approximate the period of elevated blood alcohol concentrations following drinking initiation and to be consistent with prior studies (aan het Rot et al., 2008; Testa and Derrick, 2014). We hypothesized that drinking events at parties/bars (but not at home) would increase the odds of SANP (but not SAPP) within the next four hours, and that these effects would be independent of effects of number of drinks. We do not hypothesize that drinking at home would increase the odds of SAPP (or SANP) within the next four hours independent of alcohol quantity consumed—we presume that venue effects are specific to social drinking venues and casual sex.

2. Method

2.1. Participants

Participants (N = 427) were first-year men 18 or 19 years of age at a large, public, Northeastern university. The present study included data from men who completed a baseline assessment in the fall as part of a larger study and were later invited to participate in a daily report study during the following spring (Testa, 2015). Eligibility criteria for the daily report study were designed to yield a sample of men likely to engage in drinking and sexual activity during a 56-day reporting period (thus at risk of perpetrating sexual aggression toward women (Testa, 2015). That is, baseline assessment responses were used to identify men who (a) had a hookup or sexual intercourse with a woman at least once in the first semester and (b) drank five or more drinks on one occasion at least twice per month (or drank weekly). A few men who failed to meet these criteria but who reported (c) at least one sexual aggression item on the Sexual Experiences Survey (SES) (Koss, 2007) or the Sexual Strategies Survey (SSS; Strang et al., 2013) during the first semester were also invited. We did not limit our sample to exclusively heterosexual males; however, the focus of this study was on sexual activity with women. Men who participated in the daily report study did not differ from those who chose not to participate on race, frequency of drinking, hookups, sexual aggression, or involvement in a relationship (Brown et al., 2018).

2.2. Procedure

Participants provided online consent before completing baseline and daily assessments. Every day, participants received email reminders at 9:00AM containing a link to the daily report. If they missed one day of reporting, they were allowed to complete an abbreviated make-up report for that day after completing the current day's report. Missing more than one day of reporting triggered a phone call by project staff to encourage continued reporting. Daily surveys took no more than five minutes to complete. Participants were compensated with $10 for each complete week (6/7 reports) and a $40 bonus for completing all eight weeks (maximum $120). Daily assessments are frequently used to assess college students' drinking at the event-level and have high (96%) protocol compliance on drinking days (Hultgren et al., 2020).

2.3. Measures

2.3.1. Daily drinking events

Each day, men were asked: "*Since this time yesterday, have you consumed any alcoholic beverages?*" Positive responses were followed by the questions: "*Did this drinking episode take place…at a party?*" "*…in your dorm or your home?*" or "*…a bar or other public place?*" Responses to these questions ("*Yes,*" or "*No,*" with an option to not respond) allowed us to

categorize each drinking event as occurring either at a party, bar, or other public place versus in a dorm or home. If participants reported drinking in multiple venues (i.e., at both a party/bar/other public place *and* in a dorm/home), they were categorized as drinking at a party, bar, or other public place on the premise that there were opportunities to meet new sex partners. Participants were also asked to "*Please enter the number of drinks you had*" with a range of 1 to 30 drinks, and to report the time drinking occurrence began. We coded those who did not drink as 0, allowing us to analyze number of drinks as a continuous variable. Finally, participants were asked to, "*Please enter the number of females who were with you when you were drinking*" and to report "*On average, how intoxicated would you say they were?*" on a scale of 1 ("*Not at all intoxicated*") to 7 ("*Extremely intoxicated*"). Because number of women present was only assessed for drinking events, we were limited to providing descriptives on this variable.

2.3.2. Daily sexual activity events

Each day, men were also asked: "*Since this time yesterday, have you hooked up, engaged in any sexual activity, or tried to engage in any sexual activity with a woman (including flirting, kissing, touching, or intercourse)?*" Given a tendency for men to underreport sexual aggression, this question was developed to be intentionally inclusive of all attempts to engage in sexual activity, including activity that might have been interrupted or stopped (Testa, 2015). Positive responses were followed by the question: "*Would you describe the woman involved as a previous partner, that is, someone you have been sexually intimate with in the past?*" Responses to this question were used to categorize sexual events as involving either previous (SAPP) or new partners (SANP). Participants were also asked to report the time of occurrence, allowing for a determination of the temporal ordering of drinking and sexual activity (Testa, 2015).

2.3.3. Relationship status

On the first day of the daily study, men were asked: "*Are you currently in a relationship with a woman (*i.e.*, have a girlfriend)?*" with "*Yes*" (1) and "*No*" (0) as the response options.

2.3.4. Sociosexuality

Sociosexuality was assessed at baseline via three attitude items on 9-point scales from 0 (strongly disagree) to 8 (strongly agree): "Sex without love is OK," "I can imagine myself being comfortable and enjoying casual sex with different partners," and "I would have to be closely attached to someone before I could feel comfortable and fully enjoy having sex with that person" [reversed]. We also measured four behavioral items: "How often do you fantasize about having sex with someone (other than your current dating partner if you have one)?" rated on a 7-point scale from 0 (never) to 6 (at least once a day), as well as lifetime number of sex partners, number of sex partners on one occasion, and number of sex partners desired in the next 5 years. The latter three items were assessed using open-ended responses and then Winsorized to the 95th percentile to reduce outliers (Reifman and Keyton, 2010). Items were standardized, and a mean score was calculated (Testa and Cleveland, 2017). Reliability was acceptable ($\alpha = 0.68$).

2.4. Analytic strategy

The two outcome variables in all models were (1) SANP and (2) SAPP within four hours of beginning drinking at parties/bars or at home (to approximate the period of elevated blood alcohol concentrations following drinking initiation; aan het Rot et al., 2008; Testa and Derrick, 2014), analyzed as dichotomous variables (versus no sexual activity). Data comprised 573,888 rows (427 participants × 56 days × 24 hours) modeled at Level 1. Between participant effects were modeled at Level 2.

At Level 1 (the event-level), we included the uncentered binary drinking venue variables (i.e., parties/bars; home) that occurred within four hours before sexual activity. Consistent with prior studies (Testa, 2015; Wood et al., 2007), we also included a weekend variable (versus weekday), uncentered, with the weekend including Thursday to Saturday (1) and weekdays including Sunday to Wednesday (0) because college student drinking is more likely to occur on a weekend (Wood et al., 2007). We also included time of day (5:00PM – midnight versus other times; uncentered) to control for potential time differences in occurrence of events. We included day of the study (1–56), grand mean centered, to account for the tendency for daily reports to decline over time (Testa and Derrick, 2014; Barta et al., 2012). At Level 1, we also considered the within-participant pharmacological effects of alcohol by adding the effect of number of drinks consumed during each drinking event (no drinking coded as 0), person-mean centered.

At Level 2 (the individual-level), we controlled for each man's total drinking episodes in each distinct venue over 56 days, grand mean centered, permitting distinguishing of within-person effects of drinking events from between-person effects (Enders and Tofighi, 2007). The total number of drinks consumed over 56 days were also added at Level 2, grand mean centered. To be conservative, we also included total events of sexual activity, grand mean centered, since individuals who experience more events overall are more likely to experience sexual activity at a given hour. In addition, we included relationship status on the first day of daily study, because men in relationships have more frequent sexual activity (Manning et al., 2005); and are less likely to report SANP (Testa, 2015). Finally, we considered the between-subject impact of sociosexuality at Level 2, and we examined the cross-level interaction of sociosexuality with daily drinking in each venue at Level 1. Analyses were performed using multivariate multilevel modeling and Bayesian estimation in MPlus Version 8.6 (Gelman et al., 2014; Muthén and Muthén, 2017).

3. Results

3.1. Descriptive statistics

Table 1 presents descriptive statistics. Participants ($N = 427$) completed a total of 20,366 daily reports over 56 days (85.2 % of all possible 23,912 days). Men reported 2,284 days of drinking ranging from 0 to 31 drinking days per man ($M = 5.61$, $SD = 5.47$; Median = 4), with an average of 6.88 ($SD = 4.32$; Range = 1–15; Winsorized to 93rd percentile) drinks per occasion. Men reported 1,022 days of drinking at a party/bar (including 329 days of drinking in multiple venues) and 681 days of drinking in their dorm/home (and only in their dorm/home—they did not report drinking elsewhere). Most public drinking events involved parties (867) rather than bars (283 days).

As expected, men reported that there were significantly more women

Table 1
Prior Drinking Events on Days of Sexual Activity with Previous Partners, Sexual Activity with New Partners, and No Sexual activity.

Variable	Sexual Activity with previous partners (n = 2,092)	Sexual activity with new partners (n = 309)	No sexual activity (n = 18,274)
Drinking at a party, bar, or other public place, *N* (%)	146 (6.3)	114 (47.5)	762 (4.4)
Drinking in the dorm or home, *N* (%)	202 (11.7)	58 (21.6)	750 (4.2)
Number of drinks, *M* (*SD*)	1.41 (3.40)	5.59 (5.72)	0.63 (2.33)
Weekend (vs. weekday)[a], *N* (%)	711 (39.9)	123 (39.8)	7,171 (39.2)
Time of drinking (evening vs. other times)[b], %	58.7	50.5	33.2

Note. Numbers were computed on 20,366 rows of data, 427 participants.
[a] Weekend vs weekday (0 = Monday to Thursday; 1 = Friday - Sunday).
[b] Time (0 = 1 AM to 4 PM; 1 = 5 PM to midnight; computed on 573,888 rows).

with them when they were drinking at parties ($M = 8.45$, $SD = 11.12$) versus elsewhere ($M = 1.77$, $SD = 3.72$), as well as at bars ($M = 6.43$, $SD = 11.85$) versus elsewhere ($M = 4.49$, $SD = 7.90$), $ps < 0.008$. Conversely, men reported that there were significantly fewer women with them when they were drinking in their dorm/home ($M = 3.12$ $SD = 6.91$) versus elsewhere ($M = 6.59$, $SD = 9.87$), $p < .001$, indicating there were more opportunities for SANP after drinking events that occurred at parties/bars (or that did not occur in their home/dorm). Men perceived women to be significantly more intoxicated when drinking episodes took place at parties/bars ($Ms = 4.21$–4.36, $SDs = 1.41$–1.79) versus elsewhere ($Ms = 3.27$–3.82, $SDs = 1.70$–1.88), $ps < 0.002$, and significantly less intoxicated when drinking episodes took place in their dorm/home ($M = 3.77$, SD – 1.79) versus elsewhere ($M = 4.00$, SD – 1.65), $p = .012$.

Men reported 2,092 days of sexual activity with a woman, ranging from 0 to 47 sexual activity event days per man ($M = 5.19$; $SD = 8.54$), with 37.9 % of men reporting at least one day of SANP and 55.4 % of men reporting at least one day of SAPP. Across the sample, there were 309 days of SANP, ranging from 0 to 17 new partner event days per man ($M = 0.74$; $SD = 1.46$) and 1,783 days of SAPP, ranging from 0 to 47 previous partner event days per man ($M = 4.44$; $SD = 8.53$). One-third of the sample (33.3 %; 142/427) reported being in a relationship with a woman at the beginning of the daily study.

3.2. Drinking events and subsequent sexual activity

We first tested whether drinking in certain venues (i.e., parties/bars; home) increases the odds of certain types of sexual activity (i.e., SAPP; SANP) in the next four hours. Table 2 depicts the results of a multivariate multilevel model predicting SANP and SAPP, with no sexual activity as the referent. As expected, at Level 2 (the individual-level), being in a relationship at the beginning of the study was related to increased odds of SAPP and decreased odds of SANP; and total sexual activity events over 56 days were related to increased odds of SAPP at a given hour. Total number of drinks over the 56 days positively predicted SANP (but not SAPP). Total number of drinking events at parties/bars (but not at home), also positively predicted SANP (but not SAPP). Total number of drinking events at home was not related to SANP or SAPP.

Table 2
Sexual Activity with Previous Partners and Sexual Activity with New Partners as a Function of Drinking in Certain Venues in the Previous Four Hours.

Variable	Sexual Activity with Previous Partners		Sexual Activity with New Partners	
	Estimate (S.D.)	95 % CI	Estimate (S.D.)	95 % CI
Intercept	3.284 (0.038)***	[3.215, 3.366]	3.191 (0.050)***	[3.112, 3.301]
Level 1				
Drinking in the dorm or home	0.160 (0.087)	[-0.010, 0.330]	0.181 (0.123)	[-0.069, 0.418]
Drinking at a party, bar, or other public place	0.164 (0.093)	[-0.023, 0.348]	0.357 (0.093)***	[0.176, 0.544]
Number of standard drinks	0.015 (0.008)	[0.000, 0.031]	0.065 (0.008)***	[0.049, 0.079]
Weekend vs. weekday [a]	0.007 (0.019)	[-0.029, 0.044]	0.012 (0.035)	[-0.055, 0.087]
Time [b]	0.386 (0.018)***	[0.352, 0.421]	0.157 (0.036)***	[0.089, 0.227]
Day of the study [c]	−0.003 (0.001)***	[-0.004, −0.002]	−0.007 (0.001)***	[-0.010, −0.005]
Level 2				
Relationship status	0.342 (0.043)***	[0.261, 0.430]	−0.425 (0.073)***	[-0.574, −0.297]
Total drinking episodes in the dorm or home over 56 days	0.005 (0.008)	[-0.010, 0.020]	−0.009 (0.009)	[-0.027, 0.009]
Total drinking episodes at a party, bar, or other public place over 56 days	0.007 (0.011)	[-0.014, 0.028]	0.024 (0.011)*	[0.001, 0.047]
Total sexual activity episodes over 56 days	0.040 (0.002)***	[0.036, 0.044]	0.004 (0.003)	[-0.003, 0.010]
Total number of standard drinks over 56 days	−0.391 (0.931)	[-2.224, 1.421]	1.944 (0.887)*	[0.264, 3.717]

Note.
[a] Weekend (weekend = 1, Thursday, Friday, and Saturday; weekday = 0, Sunday to Wednesday).
[b] Time (0 = Hour 1 to Hour 16; 1 = Hour 17 to Hour 24).
[c] Day of the study (1–56). *** $p < .001$, ** $p < .01$, * $p < .05$.

The number of drinks consumed during the drinking event (at Level 1) had a significant positive effect on subsequent SANP—in drinking events during which a man exceeded his own average standard drinks consumption, there was a higher likelihood of SANP (but not SAPP) in the next four hours. We predicted that, at Level 1 (the event-level), drinking events at parties/bars (but not at home), would predict SANP (but not SAPP) within the next four hours. Consistent with our hypothesis, there was a significant positive effect of drinking at parties/bars on SANP at Level 1 that was independent of the Level 2 effect of drinking at parties/bars. Drinking at parties/bars did not increase the likelihood of SAPP, and there was no pharmacological effect of drinking at home on SAPP.

We then considered whether the effects of drinking venues on sexual activity depended on the value of relationship status. Thus, we repeated analyses depicted in Table 2 by including two interaction terms (i.e., drinking at parties/bars × relationship status; drinking at home × relationship status) at Level 1. Neither interaction effect was significant. However, drinking at parties/bars became a significant predictor of SAPP ($b = 0.278$ (0.117), 95 % CI = [0.054, 0.511], $p = .018$). The pattern of all other results (not displayed) remained identical to Table 2.

As a final analysis, we repeated our analyses and considered whether sociosexuality interacted with drinking venue or drinking quantity to increase the odds of SANP. We entered sociosexuality at Level 2, and two interaction terms (drinking at parties/bars × sociosexuality; drinking at home × sociosexuality) at Level 1. As shown in Table 3, sociosexuality increased the likelihood of SANP (but not SAPP). Neither interaction effect was significant (and drinking at parties/bars was not a significant predictor of SAPP).

4. Discussion

In prior studies, effects of drinking on sex have been inconsistent, and our results suggest that this may be because drinking venue has been unspecified: When we take venues into consideration, we find no effect of drinking at home on SANP—only drinking at parties/bars leads to SANP. We sought to test whether drinking venue effects on men's SANP exist even after accounting for the intoxicating effects of alcohol, indicating that it's not just drinking, but also *where* men drink that impacts the likelihood of SANP. As hypothesized, drinking at parties/bars (but not at home) significantly affected the likelihood of men's SANP within the next four hours—the period of elevated blood alcohol concentrations following drinking initiation (aan het Rot et al., 2008; Testa and Derrick, 2014). Party/bar effects were observed even after accounting for the significant positive effect of drinking quantity on men's SANP. These findings are consistent with prior event-level associations between drinking occasions and casual sex independent of pharmacological effects of alcohol, and the gender-specific effect of drinking at bars on sexual outcomes for men (Testa, 2015; Mair et al., 2016; Bersamin, 2012; Howells and Orcutt, 2014).

These findings also extend prior event-level associations by revealing that drinking venue effects (both pharmacological and venue) on sex are specific to new partners—no effects on SAPP were observed. Prior global associations show that men high in sociosexuality engage in more SANP, and that this is mediated by drinking at parties/bars (Hone et al., 2020). Our current findings help explain this relationship at the event-level—it's not just that certain high-risk men drink at parties/bars

Table 3
Sociosexuality, Sexual Activity with Previous Partners, and Sexual Activity with New Partners as a Function of Drinking in Certain Venues in the Previous Four Hours.

Variable	Sexual Activity with Previous Partners		Sexual Activity with New Partners	
	Estimate (S.D.)	95 % CI	Estimate (S.D.)	95 % CI
Intercept	3.286 (0.034)***	3.225, 3.358]	3.206 (0.045)***	3.123, 3.295]
Level 1				
Drinking in the dorm or home	0.174 (0.128)	−0.084, 0.416]	0.205 (0.132)	−0.071, 0.446]
Drinking at a party, bar, or other public place	0.229 (0.121)	−0.012, 0.469]	0.409 (0.097)***	0.228, 0.606]
Number of standard drinks	0.014 (0.008)	−0.002, 0.030]	0.065 (0.007)***	0.050, 0.079]
Weekend vs. weekday [a]	0.009 (0.019)	−0.027, 0.046]	0.020 (0.039)	−0.064, 0.089]
Time [b]	0.386 (0.017)***	0.351, 0.419]	0.161 (0.037)***	0.089, 0.235]
Day of the study [c]	−0.003 (0.001)***	−0.004, −0.001]	−0.008 (0.001)***	−0.010, −0.005]
Drinking in the dorm or home × relationship status	−0.060 (0.164)	−0.378, 0.265]	−0.213 (0.346)	−0.964, 0.387]
Drinking at a party, bar, or other public place × relationship status	−0.162 (0.134)	−0.426, 0.097]	−0.364 (0.216)	−0.814, 0.029]
Drinking in the dorm or home × sociosexuality	0.108 (0.104)	−0.092, 0.313]	−0.070 (0.157)	−0.386, 0.238]
Drinking at a party, bar, or other public place × sociosexuality	0.147 (0.089)	−0.023, 0.326]	−0.081 (0.081)	−0.241, 0.075]
Level 2				
Relationship status	0.347 (0.041)***	0.269, 0.429]	−0.381 (0.065)***	−0.508, −0.259]
Total drinking episodes in the dorm or home over 56 days	0.005 (0.008)	−0.010, 0.020]	−0.008 (0.009)	−0.025, 0.009]
Total drinking episodes at a party, bar, or other public place over 56 days	0.006 (0.011)	−0.015, 0.026]	0.024 (0.011)*	0.002, 0.045]
Total sexual activity episodes over 56 days	0.039 (0.002)***	0.036, 0.044]	0.004 (0.003)	−0.002, 0.010]
Total number of standard drinks over 56 days	−0.351 (0.947)	−2.194, 1.487]	1.764 (0.859)*	0.060, 3.447]
Sociosexuality	−0.003 (0.024)	−0.051, 0.045]	0.058 (0.032)*	0.000, 0.121]

Note.
[a] Weekend (weekend = 1, Thursday, Friday, and Saturday; weekday = 0, Sunday to Wednesday).
[b] Time (0 = Hour 1 to Hour 16; 1 = Hour 17 to Hour 24).
[c] Day of the study (1–56). *** $p < .001$, ** $p < .01$, * $p < .05$.

frequently and separately, also engage in more SANP than their peers. These events are linked—drinking at parties/bars is associated with SANP in the next four hours *and* these effects are independent of both quantity of alcohol consumed and sociosexuality. It seems that men seek out social drinking venues like parties and bars to facilitate casual sex with potential new partners, and these event-level party/bar drinking venue effects on SANP exist even after considering the intoxicating effects of alcohol and individual differences in sociosexuality.

4.1. Limitations

We note that our definition of "previous partners" was broad and included anyone with whom the participant reported having any sexual contact with in the past. This would include partners who were regular "hookup" partners. That is, any partner that a man had reported engaging in sexual activity with before was considered a previous partner, so the measure of new partners was quite conservative, and the measure of previous partners could include a rotation of women that a man had engaged in casual sex with only once or twice before. Future research should include multiple partner types (e.g., regular hook-up partners, same-sex partners) to further disentangle pharmacological and venue effects of alcohol on sex. Moreover, there was no pharmacological effect of drinking at home on SAPP. Future studies could elaborate on venue specific effects of drinking at home on SAPP, which may occur in the context of intimate partner violence.

Our sample comprised college men almost exclusively under the age of 21 and as a result, they frequent parties more often than bars when drinking or seeking SANP. Moreover, underage men who drink at bars (e.g., via fake ID or drink sharing) are likely different from men who are of legal drinking age, as well as from underage men who do not drink at bars (i.e., on delinquency, risk-aversion). Assessing individual differences between underage bar-drinkers and non-bar drinkers, as well as collecting data from men over the age of 21 are necessary to assess generalizability of findings here. Studies of other age-restricted venues like dance clubs would be a fruitful line of future research given some dance clubs are 18+, and many are hotspots for perpetration of nonconsensual sexual behavior (Graham et al., 2014).

Our results here cannot be generalized to women and/or sex and gender minorities. Women may frequent parties/bars more or less often than their opposite-gender counterparts, and students who are sexual and/or gender minorities may also frequent different venues as compared to their cisgender and heterosexual peers. Future work should consider not only different age brackets of young adults, but also gender identity and sexual orientation, especially given high rates of SANP associated sexual aggression victimization among minoritized students.

Our measures of drinking venues were crude (e.g., we failed to distinguish drinking at home alone versus at home with peers as a pregame). Moreover, some drinking venues may be associated with SANP more than others, and future work should evaluate effects of drinking that takes place at tailgates, during pre-games or drinking games, at Greek parties, or other unique venues and subsequence SANP, controlling for quantities of alcohol consumed. This would elucidate whether non-pharmacological effects of drinking are specific to parties and bars, or are generalizable all social events. Future work on the contextual characteristics of parties, bars, and other social venues (beyond number of women present and perceived intoxication of those women) and who frequents these venues (i.e., those high in sociosexuality) are also critical for further examination of these venue effects on different types of sexual risk behavior.

4.2. Implications and future directions

Establishing that drinking at parties/bars influences SANP above and beyond alcohol's intoxicating effects has the potential to inform novel interventions for men. College students may believe that parties/bars facilitate hookups, and our results indicate that this belief is not unfounded—drinking at parties/bars does indeed facilitate SANP. Although consuming more drinks facilitates SANP, drinking at parties/bars is related to SANP within the next four hours even when accounting for number of drinks men consumed in that venue. Interventions aimed at reducing SANP should take into consideration that it's not just men's disinhibition or impaired judgment related to riskier sexual decision-making that contributes to the increased likelihood of sex (as is commonly believed)—merely spending time and drinking at parties/bars may provide opportunities for SANP shortly thereafter.

The context in which alcohol is consumed may be important because some drinking venues (e.g., parties/bars) present opportunities for interactions among new partners while others (e.g., home) do not. That is, drinking contexts likely play a role in sexual activity with new partners because certain social venues allow young adults to meet potential new sex partners, and young adults—especially college students—often frequent these venues. Indeed, drinking is believed to facilitate casual sex (Corbin et al., 2016), and the desire for new sex partners (i.e., high

and unrestricted sociosexuality) encourages college students to use alcohol to facilitate new partner sex. Corbin, Scott, and Treat found that college men high in sociosexuality tended to drink more than their peers who were low in sociosexuality (Testa and Hone, 2019). Testa and Hone replicated this effect in a prospective study of college women and added the finding that women who expected to engage in alcohol-related hookups also reported heavier subsequent alcohol use (Lopez, 2021). Moreover, Lopez and colleagues found that alcohol use mediated the relationship between sociosexuality and risky sexual behavior (Lopez, 2021). Students high in sociosexuality drink more than their peers, and they do so strategically—they seek out specific drinking venues like college parties and bars on the premise that these venues facilitate interactions with potential new sex partners who might also be seeking alcohol-involved casual sex and hookups. Future studies should test the mechanism through which this occurs by examining how number, willingness, and intoxication of potential new partners at parties and bars influence the relationship between drinking venues and sexual activity.

For decades, global studies of drinking venues' role in sexual activity have consistently revealed a relationship between drinking in certain venues and various sexual behaviors (Parks and Zetes-Zanatta, 1999). But because SANP does not occur after every drinking event, event-based studies (Parks, 2000) are needed to elucidate differences between instances when SANP occurred versus times when it did not so that we may pinpoint novel targets for intervention above and beyond reducing drinking. For example, our event-level findings reveal that it's not just men who drink more or men who drink at parties/bars more frequently who engage in more SANP; even men who drink less on average are more likely to engage in SANP when they drink at parties/bars and when they consume more than their typical amount of alcohol. This has unique implications for prevention because most individual-level prevention messages focus on risk associated with typical behavior, not how risk may vary from event-to-event.

Although not a focus of this analysis, SANP events are more likely to include sexually aggressive tactics than SAPP events (Testa, 2015). Few interventions aimed at reducing sexual aggression target men (Treat et al., 2021) and here, our findings provide a novel entry point for addressing SANP-associated sexual aggression and practical recommendations for reducing risk (e.g., tailoring protective behavioral strategies to the context). Also of note, prior work has shown that between-person factors like individual differences in sociosexuality impact men's drinking at parties/bars (Hone et al., 2020) and subsequent sexual aggression perpetration (Cleveland, Testa, & Hone, 2019; Yost & Zurbriggen, 2006). Men high in sociosexuality also report more coercive sexual attitudes and past use of sexual aggression; higher levels of rape myth acceptance, adversarial sexual beliefs, conservative attitudes towards women, and power motivation; and lower levels of affiliation and intimacy motivations (Yost and Zurbriggen, 2006). There is a need for additional research on other potential between-person factors that might impact these event-level associations (e.g., whether venue is only predictive of sexual outcomes among certain men who might seek out these venues to target potential victims).

CRediT authorship contribution statement

Liana S.E. Hone: Conceptualization, Methodology, Validation, Writing – original draft, Writing – review & editing, Funding acquisition. **Maria Testa:** Investigation, Resources, Writing – original draft, Writing – review & editing, Supervision, Funding acquisition. **Weijun Wang:** Software, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Data curation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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