How Much Does One More Drink Matter? Examining Effects of Event-Level Alcohol Use and Previous Sexual Victimization on Sex-Related Consequences

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ABSTRACT. Objective: The first semester of college has been associated with increased drinking and sexual risk. However, it remains unclear why some drinking occasions result in experiencing negative sexual consequences whereas others do not. The current study used a diary-based approach to assess the event-level effect of alcohol use and previous adult/adolescent sexual victimization (PSV) on experiencing negative sex-related consequences in first-year college women. **Method:** Participants ($N = 120$) provided repeated measures of weekend drinking and sex-related consequences on the Friday and Saturday nights of six different weekends over the course of their first semester, resulting in 12 measured drinking occasions. A multilevel model was used to assess both between- and within-person effects of alcohol use and between-

person effects of PSV on the likelihood of experiencing negative alcohol-related sexual consequences. **Results:** Findings revealed an important within-person association, such that every drink consumed above one's mean was associated with a 13% increase in the likelihood of experiencing negative consequences. In addition, PSV had a significant main effect on experiencing negative sex-related consequences. Individuals with PSV experienced nearly 2.5 times more sexual consequences than individuals without PSV. **Conclusions:** These results yield important implications for prevention, particularly with respect to limiting "above average" alcohol consumption among women with a history of sexual victimization. (*J. Stud. Alcohol Drugs*, 75, 241–248, 2014)

THE FIRST SEMESTER OF COLLEGE has been associated with increases in drinking (Hingson et al., 2005; Humphrey and White, 2000; Turrisi et al., 2009). Approximately 50% of students begin drinking regularly for the first time when they enter college (Turrisi et al., 2013), and inexperienced drinkers have been shown to be at increased risk for experiencing negative alcohol-related sexual consequences such as unprotected, unwanted, or forced sex (Neal and Fromme, 2007). Alcohol consumption has been implicated in more than 50% of sexual victimization situations (Abbey, 2002), with particular prominence among first-year college women (e.g., Abbey et al., 1996; Flack et al., 2007; Parks et al., 2008). Further, previous sexual victimization (PSV), occurring in adolescence, has been associated with increased alcohol consumption and future revictimization (Testa et al., 2010), suggesting that first-year women who come to college with a recent history of PSV may be particularly at risk for drinking and experiencing sexual consequences once they arrive on campus. What remains unclear is why some drinking occasions during the first year of college result in experienc-

ing negative sexual consequences whereas others do not. To address this issue, the current study used a diary-based approach to assess the effects of event-level alcohol use and recent (past-year) PSV on the likelihood of experiencing negative sex-related consequences in an all-female sample of first-year college students.

Event-level approach

Studies examining the relationship between drinking and increased rates of experiencing sex-related consequences at the event level have reported inconsistent findings, as the methodologies and types of consequences assessed have varied widely. For example, Brown and Venable (2007) found that students who drank during their last sexual encounter with a nonsteady partner were more likely to have unprotected sex, whereas Desiderato and Crawford (1995) observed no association between alcohol consumption and unprotected sex. Other studies, using a critical-incident approach (Weinhardt and Carey, 2000) or recall of single events, have compared sexual events involving and not involving alcohol. Although Trocki and Leigh (1991) found that students were less likely to use condoms after drinking, Testa and Collins (1997) found no differences in adolescent females' condom use, regardless of the presence of alcohol.

A limitation of these studies was that they examined only one or two events that may not adequately represent typical

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behaviors (e.g., most recent sexual encounter). In contrast, Patrick and Maggs (2009) used a repeated measurement event-level approach to collect daily diary data across 14 consecutive days. However, a majority of their observed days were nondrinking days, and they did not observe significant associations between daily alcohol use and experiencing negative consequences of sex (e.g., feeling like things moved too fast). In contrast, using 7-day drinking diaries, Neal and Carey (2007) found a significant event-level association between alcohol intoxication and risk of experiencing negative consequences, particularly sexual consequences (e.g., unsafe, forced, or coerced sex).

Although previous research has examined event-level associations between alcohol consumption and risky sexual behaviors or sex-related consequences, these studies have not focused solely on drinking occasions, nor have they examined the role of recent PSV within the alcohol-consequence relationship in first-year college students. The present study used assessments of 12 possible drinking days (e.g., Fridays and Saturdays) over six weekends, taking into consideration incidents of sexual victimization that occurred in the year before entering college, in order to clarify the relationship between alcohol and sex-related consequences.

Previous sexual victimization

Numerous studies have observed that both childhood sexual abuse and adult/adolescent sexual victimization have been associated with future victimization (e.g., Gidycz et al., 1993; Testa et al., 2010). For example, a recent national surveillance study indicated that approximately 35% of women who reported PSV before age 18 experienced revictimization as adults (Black et al., 2011). Thus, it is plausible that victimization occurring in the year before college could predict future negative sex-related consequences independent of alcohol consumption in first-year college women.

Women with PSV are also at an increased risk for lower self-esteem, depression, and problem drinking (Kilpatrick et al., 2000; Nolen-Hoeksema, 2004). Given these associations, it is also plausible that PSV could moderate (by either strengthening or weakening) the relationship between alcohol use and sex-related consequences (Kilpatrick et al., 2000). The event-level approach used in the current study allows for further exploration of the day-to-day fluctuations in drinking and associated consequences among women who have experienced PSV in the past year versus those who have not. Such findings will inform intervention efforts designed to meet the needs of previously victimized college students.

Current study

The current study builds on literature by assessing the association between alcohol use and sex-related consequences

among first-year college women, using a repeated-measures, event-level approach. Two aims guided the present study. The first aim was to examine both between- and within-person differences in the association between alcohol use and negative sex-related consequences (unplanned, unprotected, regretted, and unwanted/forced sex). Using a multilevel model, the effect of average drinking on experiencing consequences was assessed to address whether the likelihood of experiencing negative sex-related consequences differed between individuals who engaged in more or less drinking. The model also examined within-person variability in the relationship between alcohol use and negative sex-related consequences to identify if days on which individuals exceeded their typical drinking pattern (i.e., daily fluctuations in drinking) were associated with experiencing sex-related consequences. It was hypothesized that both within-person deviation from one's average number of drinks and between-person typical number of drinks would be positively associated with the likelihood of experiencing sex-related consequences on a given day.

The second aim evaluated the role of PSV, a between-person variable, within the association between alcohol use and sex-related consequences among first-year college women. Based on research showing positive relationships between sexual victimization and revictimization (Testa et al., 2010), sexual victimization and heavy drinking (Kilpatrick et al., 2000; Nolen-Hoeksema, 2004), and heavy drinking and sexual consequences (Abbey, 2002; Core Institute, 2010), two hypotheses were posited. First, it was expected that PSV, experienced in the year before entering college, would have a positive main effect on negative sex-related consequences. Second, PSV was also expected to moderate the within-person relationship between daily fluctuations in alcohol use and sex-related consequences such that the relationship would be stronger for women who reported prior victimization.

Method

Participants

Participants were 120 first-year, female college students from a large, public university in the Northeast United States. All participants were current drinkers such that they reported alcohol use within the month before study enrollment. On average, the sample was 18.16 ($SD = 0.40$) years of age on the first drinking occasion. Participants mostly identified as White (86.7%) and heterosexual (98.3%). A smaller portion of participants identified as Hispanic/Latina (11.9%), Asian/Asian American (7.5%), Black/African American (2.5%), and multiracial (2.5%). Only participants who identified as drinkers were used in the current study, and drinking behaviors were widely varied, with participants reporting an average of 11.84 ($SD = 7.78$) drinks per

week. These demographic characteristics are consistent with those describing the entire female sample within the larger study (described below) as well as with the demographics describing the first-year population of female drinkers at the university where the study was conducted.

Recruitment and procedures

Participants were recruited during the beginning of the fall semester as part of a larger, longitudinal study assessing self-regulated drinking behaviors in first-year college student drinkers. A random sample of 700 first-year students between ages 18 and 20 years was drawn from a university database of all students. Students were sent both a letter and an email describing the study and inviting their participation. They were asked to complete six web-based assessments (each survey assessed drinking behaviors on a consecutive Friday and Saturday) starting in October of their first year of college. Each student received an email with a URL and personal identification number when it was time to complete each assessment. Survey invitations were emailed on Sundays, and participants had 3 days to complete each assessment, which asked about drinking behaviors that occurred over the weekend. Students were sent up to three email reminders per survey. Because the goals of the study were to examine drinking behaviors, only students who completed the initial assessment and reported past-month alcohol use were invited to complete the remaining five surveys.

Surveys 1 and 6 were approximately 45–60 minutes in length, whereas surveys 2–5 were relatively brief, lasting 10–15 minutes each. Participants were compensated up to \$100 for their participation, receiving \$30 on completion of each of the longer surveys and \$10 for completion of each brief survey. The university's institutional review board reviewed and approved all procedures.

A total of 476 students completed the initial survey, yielding a 68% response rate, with 358 (75% of respondents) meeting the drinking-specific inclusion criteria. Retention rates for the remaining surveys were high, ranging from 98.6% at Wave 2 to 93.0% at Wave 6. Because the aims of the current study were to study the role of alcohol use and PSV among women, all participants within the current study ($N = 120$, 33.5% of the original sample) completed at least two assessments, including Wave 1 and Wave 6, which assessed gender and PSV, respectively. Participants were not excluded from the sample based on missing data at any other time points (i.e., Waves 2–5).

Measures

The current study included 12 repeated measures of student alcohol use and sex-related consequences (reported separately for Friday and Saturday over six weekends) as

well as a single measure of PSV incidents 1 year before college. The timing of the PSV assessment was planned to ensure that prior incidents were mutually exclusive from reports of sex-related consequences experienced during the study's event-level assessment period. Each measure will be discussed in turn.

Alcohol use. Students were asked to report the number of drinks they consumed on Friday and Saturday for each of the six weekend assessments, resulting in a total of 12 potential drinking occasions. A typical drink was defined as a 12 oz. beer, a 10 oz. wine cooler, 4 oz. of wine, or 1 oz. of 100-proof (1.25 oz. of 80-proof) distilled spirits (National Institute on Alcohol Abuse and Alcoholism, 2000). Students also reported their body weight and the number of hours they spent drinking on that occasion. This information was used to calculate an estimated blood alcohol concentration (eBAC) for each reported drinking occasion.

Sex-related consequences of alcohol use. On the nights that students reported any alcohol use, they were asked follow-up questions pertaining to alcohol-related consequences using items adapted from the Young Adult Alcohol Consequences Questionnaire (Read et al., 2006). The current study used a subset of items to assess negative sex-related consequences (e.g., unplanned/unprotected sex, regretted sex, and unwanted sexual attention). Students were asked to indicate whether they had experienced any of the consequence items on that particular drinking occasion (e.g., "After drinking on Friday . . . I neglected to protect myself or my partner from an STD or unwanted pregnancy"; "I ended up having sex I later regretted"; "I was sexually harassed"), where 1 = yes and 0 = no. Although the number of consequences experienced over the 12 assessments ranged from zero to three ($M = 0.24$, $SD = 0.58$) for each occasion, a majority of participants (81.3%) experienced no negative consequences on a given occasion.

Previous sexual victimization. PSV was assessed using Testa and colleagues' (2010) revised version of the Sexual Experiences Survey (Koss and Oros, 1982; Koss et al., 1987; Testa et al., 2004). This measure consisted of 20 items that asked participants to report how many times (0, 1, 2, 3, ≥ 4) in the year before Wave 1 of the study they experienced unwanted sexual advances (i.e., touching, kissing, or vaginal, anal, or oral sex) as a result of either threats, verbal coercion, physical force, or incapacitation caused by alcohol or other drugs. Approximately 42% of the sample ($n = 50$) reported at least one unwanted sexual experience in the year before the study, with a majority of victims reporting more than one experience. Of the 50 participants who reported at least one unwanted sexual experience, 13 (26%) indicated that their most serious experience consisted of unwanted sexual contact (e.g., touching, kissing, fondling), 16 (32%) indicated coercion or attempted coercion, and 21 (42%) indicated attempted or completed rape. Responses were collapsed and

coded into a dichotomous measure of PSV (1 = any; 0 = none).

Analytic rationale

A multilevel model (HLM version 7.0; Raudenbush et al., 2011) was used to examine (a) between- and within-person relationships between alcohol use and sex-related consequences and (b) whether PSV moderated the within-person relationship between alcohol use and negative sex-related consequences. Because of the count nature of consequences, which was also skewed with a high proportion of zeros, an overdispersed Poisson distribution was used (Snijders and Bosker, 1999). The zero-inflated negative binomial (ZINB) model and hurdle model were also considered; however, the hurdle model did not allow for differentiation between structural and functional zeros (see Atkins et al., 2013), and the ZINB model presented challenges within HLM, likely because of the inclusion of random effects (see Rabe-Hesketh and Skrondal, 2008).

Further, the more parsimonious overdispersed Poisson has been considered functionally equivalent to the ZINB model (Atkins et al., 2013) and is the best analytical choice for the current study. To separate the within- and between-person effects of drinking on sex-related consequences, drinking was group mean centered at Level 1 and grand mean centered at Level 2. The resulting model is described below:

Level 1 model

Probability model: $E(\text{SEXCONS}_{it} | \pi_i) = \lambda_{it}$

Link function: $\log[\lambda_{it}] = \eta_{it}$

Linear model: $\eta_{it} = \pi_{0i} + \pi_{1i} \times (\text{DRINKS}_{it}) + \pi_{2i} \times (\text{TIME_CE}_{it})$

Level 2 model

$\pi_{0i} = \beta_{00} + \beta_{01} \times (\text{PSV}_i) + \beta_{02} \times (\text{DRINKS_M}_i) + r_{0i}$

$\pi_{1i} = \beta_{10} + \beta_{11} \times (\text{PSV}_i)$

$\pi_{2i} = r_{2i}$

The research questions aimed to predict the probability of experiencing negative sex-related consequences (SEXCONS), given one's pattern of drinking (DRINKS) and history of PSV. As such, the appropriate statistical model resulted in a probability model, typical of analyses describing a Poisson distribution. However, obtaining the expected probability given other factors was not interpretable for our scientific purposes. Thus, a log-link function was used to translate the results into the linear model format for ease of interpreting the findings. Event rate ratios (ERR) were calculated by exponentiating the log estimates of the intercept and coefficients, which present results in terms of likelihood of occurrence. Both coefficient estimates and ERR are pre-

sented in Table 2; however, results will be discussed in terms of the more meaningful ERR.

In the equation described above, at Level 1, the likelihood of experiencing negative sex-related consequences on a given drinking occasion was modeled as a function of an intercept (π_{0i}), a slope describing change in the likelihood of experiencing consequences with each additional drink (above the mean) consumed (π_{1i}), and a slope describing change in the likelihood of experiencing consequences over time (π_{2i}).

Level 2 variables were modeled as functions (e.g., averages across individuals in the sample) of the Level 1 variables described above. Specifically, Level 2 variables included the sex-related consequences intercept (π_{0i}), which represented the person-level average of consequences experienced (β_{00}), the main effect of PSV (β_{01}), the effect of between-person differences in average alcohol use across the measured days (β_{02}), and between-person residuals (r_{0i}). The within-person alcohol use slopes (π_{1i}) were modeled as a function of the average association of daily alcohol use and sex-related consequences across all individuals in the sample (β_{10}) and the effect of PSV on this association (β_{11}) (i.e., the Alcohol $\times$ PSV cross-level interaction).

Examination of the final estimation of variance components revealed the relationship between alcohol use and sex-related consequences should not be allowed to vary, $\chi^2(117) = 117.03, p = .48$; thus, a Level 2 residual was not included in this portion of the model. Finally, for the slope associated with incremental change in consequences over time, the fixed effect was removed, leaving only the residual (r_{2i}). This allowed for fluctuations in consequences over time without requiring a linear trend, as it was not expected that consequences would occur as a function of time.

As a secondary analysis, the model described above was re-estimated; however, the Level 1 and Level 2 drinking variables (DRINKS and DRINKS_M) were replaced by event-level and average eBAC, respectively. This model was used to validate the findings by accounting for participants' level of intoxication.

Results

Descriptive statistics

Participants provided data for 760 drinking occasions, with each participant reporting alcohol use on at least 3 of the 12 measured occasions. Approximately 72% of participants reported drinking on at least half (6) of the measured occasions ($M = 7.24, SD = 2.43$). Further, participants reported consuming an average of 5.60 ($SD = 3.26$) drinks per drinking occasion, and more than 30% of the sample reported experiencing at least one sex-related negative consequence within the 6 weeks of assessment. Mean eBAC across the 12 drinking occasions ranged from .12 to .16. A full presentation of descriptive statistics can be found in Table 1.

TABLE 1. Level 1 and Level 2 descriptive statistics

Variable	<i>N</i>	<i>M</i> (<i>SD</i>) or % (<i>n</i>)	Min.	Max.
Level 1	760			
Negative sex-related consequences		0.24 (0.58)	0.00	3.00
Weekend drinks		5.60 (3.26)	1.00	22.00
Level 2	120			
Average drinking		5.16 (2.25)	1.25	13.00
Previous sexual victimization		41.7% (50)	0.00	1.00

Notes: Level 1: 760 represents the total number of drinking occasions assessed (across all participants). All Level 1 variables are group mean centered. Level 2: 120 is the total number of female drinkers who provided data. All Level 2 variables are grand mean centered. Min. = minimum; max. = maximum.

Multilevel model results

Table 2 presents the primary multilevel model results, including coefficient estimates, ERR, and ERR confidence intervals (CI) for all fixed effects as well as parameter estimates for all variance components, or random effects. The first finding of significance is a within-person association between drinking and negative sex-related consequences (β_{10}). On days when individuals consumed a greater number of drinks above their “typical” number (as reflected by within-person centering), they also reported experiencing more sex-related consequences. More specifically, examination of the ERR reveals that every drink consumed above one’s mean was associated with a 13% increase in the likelihood of experiencing a negative sex-related consequence on that drinking occasion ($\beta = 0.12$, $SE = 0.02$; ERR = 1.13, 95% CI [1.09, 1.17]).

The second finding of importance revealed a significant main effect of PSV on negative sex-related consequences (β_{01}). Individuals with PSV experienced sex-related consequences at a rate nearly 2.5 times higher than individuals with no PSV ($\beta = 0.91$, $SE = 0.17$; ERR = 2.48, 95% CI

[1.78, 3.47]). Mean levels of drinking did not significantly predict sex-related consequences (β_{02}), and the cross-level interaction between fluctuations in daily drinking and PSV was not significant (β_{11}).

The secondary model (not shown in the table), which assessed eBAC instead of number of drinks, confirmed these findings. In addition, this model revealed a significant main effect of average eBAC on negative sex-related consequences, such that individuals with higher average eBACs across the 6 weeks tended to experience more consequences ($\beta = 3.67$, $SE = 1.15$; ERR = 39.37, 95% CI [4.06, 382.19]). The cross-level interaction between event-level eBAC and PSV was also significant, indicating that individuals with PSV were nearly 10 times more likely to experience consequences on occasions when they reached higher-than-average levels of intoxication compared with individuals without PSV ($\beta = 2.28$, $SE = 1.21$; ERR = 9.78, 95% CI [0.90, 106.27]).

Discussion

The current study had two aims. The first examined both between-person and within-person differences in the

TABLE 2. Summary of regression coefficients for hypothesized model

Fixed effects ^a	Coefficient (<i>SE</i>)	ERR	[confidence interval]
Average likelihood of negative sex-related consequences, π_0			
Intercept, β_{00}	-3.37 (0.09)***	0.03	[0.03, 0.04]
Main effect of PSV, β_{01}	0.91 (0.17)***	2.48	[1.78, 3.47]
Effect of person-level average drinking, β_{02}	0.04 (0.03)	1.04	[0.97, 1.11]
Average fluctuations in daily alcohol use, π_1			
Intercept, β_{10}	0.12 (0.02)***	1.13	[1.09, 1.17]
Alcohol $\times$ PSV interaction effect, β_{11}	0.02 (0.03)	1.02	[0.95, 1.08]
Random effects			
	Parameter estimate	<i>df</i>	χ^2
Intercept, r_0	1.19***	117	438.90
Time slope, r_2	0.09***	120	299.51

Notes: ERR = event rate ratio; PSV = previous sexual victimization. The overall model is based on 12 occasions nested within 120 participants for a total number of 760 observations. ^aBecause consequences were not expected to vary as a function of time, and the fixed effect of time (π_2) was ultimately removed from the model, it is excluded from the table of results.

*** $p < .001$.

association between alcohol use and negative sex-related consequences in a sample of first-year college women. It was hypothesized that first-year female students' alcohol use (at both between- and within-person levels) would be positively associated with the experience of negative sex-related consequences. This hypothesis was supported at the within-person level. On days when an individual reported drinking more alcohol than she typically consumed, she was also more likely to experience negative sex-related consequences.

This suggests that intervention efforts could encourage women to consider what is "typical" for them and set limits accordingly, as higher alcohol consumption is more likely to result in negative sexual consequences on occasions when women consume more than their typical, or average, amount of alcohol. It seems such a message could be easily adapted for use within existing parent- or individual-based interventions that target college drinking (e.g., parent-based intervention [Turrisi et al., 2013]; brief motivational interventions [Dimeff et al., 1999]).

However, it is also important to highlight that when level of intoxication was considered, as opposed to just number of drinks, higher average eBACs also were significantly related to experiencing negative sex-related consequences both within and between persons. Thus, in designing messages that support setting limits around a "typical" number of drinks, it is important to emphasize that women with consistently high levels of intoxication will still be at risk and that building a high tolerance is not protective. This is consistent with research that has identified a consistent global relationship between heavy drinking and risk of sexual consequences (Testa and Hoffman, 2012; Testa et al., 2010).

The second aim of the study was to further explain the event-level association between alcohol use and negative sex-related consequences by exploring the role of PSV (measured at the between-person level). As expected, a significant main effect of PSV on sex-related consequences was observed. Individuals who experienced some level of sexual victimization in the year before the study reported a significantly higher number of negative sex-related consequences during the study. This association between PSV and subsequent sexual consequences is quite alarming and suggests the need for prevention efforts specifically targeting female students who have been previously victimized. Although more research is needed to understand causal factors underlying the relationship between PSV and subsequent sex-related consequences, it may prove advantageous to reach recent victims of sexual assault with interventions that teach protective drinking and dating behaviors. These skills could prevent future high-risk alcohol use and negative sex-related consequences.

There was partial support for the hypothesis that PSV would moderate the association between deviations from one's typical drinking and negative sex-related consequences. The relationship was not significant when drinking was as-

sessed by number of drinks; however, when eBAC was examined, the expected interaction was supported. Compared with women without PSV, women who reported unwanted sexual experiences in the previous year were at significantly higher risk for experiencing subsequent negative consequences on days when they reached higher-than-average eBACs. This suggests that number of drinks alone does not account for the differential risk between women with and without PSV, and the time over which one's drinking occurred or drinking style (e.g., drinking quickly, drinking shots) should be considered.

It is plausible that this interaction might be influenced by type and severity of both PSV and consequences. Because of small cell sizes, this level of specificity was beyond the scope of the current study. The current sample included participants who experienced all forms of PSV, including unwanted contact, coercion, and rape. The severity of these experiences may have an impact on one's drinking behavior and future risk of experiencing consequences or potential revictimization (Testa et al., 2010).

Similarly, it would be useful to explore whether this relationship remains consistent across different types of sexual consequences. The current study combined unplanned/unprotected sex, regretted sex, and unwanted sexual attention into one sexual consequences category. Future work should examine these consequences separately and include forced sex, as these consequences clearly vary in severity and may be differentially affected by drinking and PSV.

In addition to further exploring moderators, future work might consider mediating relationships between alcohol and negative sexual consequences. Given the significant effect of daily fluctuations in alcohol use on consequences and the significant effect of PSV on consequences, it is plausible that within-person fluctuations in alcohol use mediate the relationship between PSV and future sex-related consequences. For example, individuals with PSV may have more frequent heavy drinking days, subsequently increasing the opportunity to experience negative sex-related consequences. Alcohol has been identified as a mediator in the sexual victimization–revictimization relationship at the global level (Testa et al., 2010); however, these relationships have yet to be explored at the event level and would provide a good avenue for future work.

It is noteworthy to bring attention to the large number of women in our sample who endorsed experiencing sex-related consequences. More than 30% of the sample reported at least one sex-related consequence as an outcome of their drinking during the 6 weeks in which the study was conducted. Further, consistent with previous work examining victimization across the transition to college (e.g., Testa and Hoffman, 2012; Testa et al., 2010), more than 40% of the participants endorsed experiencing PSV in the year before the study. Moreover, the modal type of experience reported was attempted or completed rape—the most severe

experience one could report. This highlights the magnitude of sexual victimization in this population and the need for more research differentiating between the different types of unwanted sexual experiences as well as efficacious prevention efforts to reduce sexual victimization and the negative sex-related consequences of alcohol use.

Limitations and future directions

The current study contributes unique aspects to this field of literature, specifically in quantifying the risk associated with membership in a vulnerable population (first-year college women with PSV) that may benefit from intervention efforts. However, there were limitations to the study that should be addressed. First, the sample of first-year women was demographically homogeneous and represented one third of the originally recruited sample. It is important that future studies replicate these findings in larger, more diverse samples of freshmen. Second, the current study may be limited by its narrow scope of measurement, focusing on weekend-only assessments of drinking and a small selection of consequences. Despite contributing to our knowledge of weekend drinking behaviors, daily diaries that span the full week and a larger variety of consequences should be assessed to develop a more complete picture of "typical" drinking behaviors and consequences.

In addition, the current study assessed the association between alcohol use and negative sex-related consequences without taking into account individuals' drinking context. For example, Brown and Venable (2007) looked at this association within the context of partner type and found that after drinking, individuals are more or less likely to engage in unprotected or unsafe sexual activity depending on how well and in what context they knew the person with whom they were having sex. Other drinking context variables might include where students are drinking (e.g., at a fraternity house, at a football game, at a bar or nightclub), with whom they are drinking, or the social context (i.e., whether they are out with friends or on a date). Although the current study does not account for these variables, their inclusion in future studies may provide clearer insight into the association between college students' alcohol use and their experiences with negative sex-related alcohol consequences.

Finally, the current study did not examine positive sex-related consequences associated with alcohol consumption (e.g., having an enjoyable experience, meeting a new partner). These consequences are prevalent among college students (Lee et al., 2010; Patrick and Maggs, 2009) and should be taken into account when examining longitudinal patterns of sexual behavior and alcohol use. For instance, experiencing positive sex-related consequences and having an absence of negative sexual consequences could reinforce risky alcohol consumption and increased risk behavior. Further, it is unclear how positive and negative sex-related consequences

uniquely influence subsequent alcohol use and sexual risk behaviors; therefore, future work is needed to explore this relationship.

Conclusions

The current study contributes a unique, event-level perspective on the between-person differences and within-person covariation in alcohol use and negative sex-related consequences among first-year college women. The current findings provide additional support for relationships discovered through previous research (e.g., Neal and Carey, 2007). They also shed light on new perspectives regarding alcohol and negative sex-related consequences, particularly in relation to PSV. Findings from the current study provide a clearer understanding of the etiology of the relationships among alcohol use, PSV, and sex-related consequences as well as suggested entry points for intervention efforts.

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