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Dangerous Liaisons: The Role of Hookups and Heavy Episodic Drinking in College Sexual Victimization

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Abstract

Heavy episodic drinking (HED) and hookups increase college women's vulnerability to sexual victimization. We examined whether the effect of HED on first year college sexual victimization severity was mediated via hookups, that is, casual sexual encounters between individuals not in a relationship. We also tested the hypothesis that greater sexual limit-setting would attenuate the positive effect of hookups on sexual victimization. Freshman women ($N = 335$) were recruited by email to complete an online survey regarding their college drinking and sexual experiences. The effect of HED frequency on sexual victimization was completely mediated via hookups. There was a significant indirect path from HED to victimization via alcohol-involved hookups; the path through sober hookups was not significant. We found some support for the hypothesis that sexual limit-setting reduced the impact of hookups on sexual victimization severity. Findings suggest the importance of targeting sexual behavior, which frequently occurs in conjunction with drinking, as a way of preventing college sexual victimization.

Keywords

Sexual victimization; alcohol; heavy episodic drinking; sexual behavior; college

College women who engage in heavy episodic drinking (HED) are at increased risk of sexual victimization (see Lorenz & Ullman, 2016 for a review). Half of college sexual assaults occur when the victim, the perpetrator, or both have been drinking (Abbey, 2002) and HED episodes increase the odds of being sexually victimized later that day by 19 times (Parks, Hsieh, Bradizza, & Romosz, 2008). Casual sexual encounters or "hookups" also increase risk for sexual victimization (Franklin, 2010; Tyler, Schmitz, & Adams, 2017) and hookups are a common context in which sexual victimization occurs (Flack et al., 2007). Women who drink more heavily report more casual sexual partners and hookups (Claxton, DeLuca, & vanDulmen, 2015). Using a sample of first year college women, we

hypothesized and tested an indirect effects model in which the effects of HED on sexual victimization are proposed to be mediated via hookups. Although definitions of hookups vary somewhat across studies, they are typically considered to be casual sexual encounters, not limited to intercourse, involving partners who are not in a romantic relationship and do not expect future commitment (see Bogle, 2008; Flack et al, 2016; LaBrie, Hummer Ghiadarov, Lac & Kenney, 2014; Paul, McManus, & Hayes, 2000). We have adopted such a definition.

Heavy Episodic Drinking and Vulnerability to Sexual Victimization

Drinking alcohol, particularly HED (4 or more drinks on an occasion), increases college women's vulnerability to subsequent sexual assault, which often occurs when the woman is incapacitated by alcohol (Krebs, Lindquist, Warner, Fisher, & Martin, 2009; Mellins et al., 2017; Messman-Moore, Ward, & DeNardi, 2013; Mouilso, Fischer, & Calhoun, 2012). Daily report studies demonstrate that occasions of heavy (4+ drinks, Parks et al., 2008) and heavier than one's usual drinking (Neal & Fromme, 2007; Scaglione et al., 2014) increase the risk of experiencing sexual victimization later that day. There are both direct and indirect mechanisms that may account for the association between HED and sexual victimization. First, women who drink to the point of incapacitation or unconsciousness are vulnerable to incapacitated rape, i.e., unwanted intercourse that occurs because the victim is unable to consent, respond, or object (Testa & Livingston, 2009). Intoxication at less extreme levels may contribute to sexual victimization indirectly as a result of alcohol-related impairment in the ability to recognize, interpret, and respond to sexual assault risk cues (Melkonian & Ham, 2018).

The settings in which alcohol is consumed may also contribute to victimization, since intoxication increases sexual vulnerability only when it occurs in the presence of a potential perpetrator. Most underage college students drink at parties, and to a lesser extent at bars (Clapp, Reed, Holmes, Lange, & Boas, 2006; Mair, Ponicki, & Greenwald, 2016). Many college students believe that alcohol disinhibits sex (Ven & Beck, 2009) and view drinking settings as places that facilitate casual sexual encounters (Lindgren, Pantalone, Lewis, & George, 2009). Sexual advances and activity are normalized in these drinking settings (Norris, Nurius, & Dimeff, 1996; Thompson & Cracco, 2008), which attract individuals seeking not only to drink but to meet potential sex partners (Corbin, Scott, & Treat, 2016). Women's vulnerability within these settings also reflects the effects of men's intoxication. Men's alcohol consumption has been associated with increased likelihood of sexually aggressive behavior in experimental and daily diary studies (Abbey & Wegner, 2015; Neal & Fromme, 2007).

A recent meta-analysis concluded that, among college students and young adults, alcohol use is positively associated with casual sex (Claxton et al., 2015). For example, college students who drink more alcohol or to a higher level of intoxication report more hookups (Owen, Fincham & Moore, 2011; Paul et al., 2000) and the majority of hookups occur when participants are drinking (LaBrie et al, 2014; Paul & Hayes, 2002). Daily diary studies provide evidence that drinking episodes increase the likelihood of having sex with a casual or new partner in the next few hours (Parks, Hsieh, Collins, & Levonyan-Radloff, 2011;

Testa et al., 2015). Such findings are consistent with the notion that alcohol – or the settings in which it is consumed – facilitates these casual sexual encounters. Party attendance and frequency of being drunk at parties predict having sex with a stranger (Bersamin, Paschall, Saltz, & Zamboanga, 2012). Even after accounting for volume of drinking, frequency of attending parties and bars was associated with frequency of unplanned sex and number of sex partners (Mair et al., 2016).

Hookups and Sexual Victimization

Sex partners (Franklin, 2010; Walker, Messman-Moore, & Ward, 2011) and specifically, hookups and casual sexual encounters (Fielder, Walsh, Carey, & Carey, 2014; Mellins et al., 2017; Turchik & Hassija, 2014; Tyler et al., 2017) are positively associated with experiencing sexual victimization. Event-level studies show that hookups are particularly common contexts in which college sexual victimization events occur. For example, the majority of unwanted sexual penetration experiences occurred within a hookup situation (Flack et al., 2007). Although not necessarily limited to hookups, Harrington and Leitenberg (1994) found that most acquaintance sexual assaults occurred following some level of consensual sexual activity. In a daily report study, college men reported using some degree of verbal, physical or intentional intoxication tactics to convince a new sexual partner to have sex with them in the majority of such encounters (63%, Testa et al., 2015). Hookups may be particularly risky contexts because of a lack of norms guiding the sexual activity and the likelihood of misperception of the other's sexual interest (Flack et al., 2007; Lovejoy, 2015). Men tend to over-perceive women's sexual interest (Farris, Treat, Viken, & McFall, 2008) and dates that ended in sexual victimization, compared to other dates, involved higher levels of sexual misperception (Muehlenhard & Linton, 1987; Abbey, McAuslan, Zawacki, Clinton, & Buck, 2001). Women's willingness to engage in some sexual activity may lead the man to believe she is willing to engage in increasingly intimate behaviors.

Hookups or other casual sexual activity may be the pathway by which women's HED increases their vulnerability to sexual victimization. Having a hookup while under the influence of alcohol increases the likelihood of experiencing negative affect and other negative consequences compared to sober hookups (LaBrie et al, 2014; Lewis, Granato, Blayney, Lostutter, & Kilmer, 2012). Recently, Ford (2017) considered risk factors for experiencing rape during the most recent hookup, an outcome that occurred in 2.4% of the 7,481 hookups examined. Consuming more drinks before the hookup increased the odds that the experience resulted in rape, both due to being drunk or incapacitated and due to force. The association between intoxication at the time of hooking up and rape may reflect the fact that intoxication impairs social perception, communication, and ability to extricate oneself from a situation (Melkonian & Ham, 2018), while contributing to sexually aggressive male behavior (Testa, Brown, & Wang, 2018). Experimental studies show that men view women who are drinking alcohol as more sexually available than women drinking cola (George, Gournic & McAfee, 1988). Thus, it is also plausible that men target highly intoxicated women or even encourage their intoxication prior to hooking up with the goal of having sex with them.

Although intoxicated hookups may be particularly risky, 26% of women who experienced forcible rape during their last hookup had consumed no alcohol (Ford, 2017). Regardless of whether alcohol is involved, hookups may pose a risk for sexual victimization due to lack of norms governing hookup behaviors and difficulties in sexual communication between unacquainted partners. In addition, hookups typically occur in private, isolated settings, which make it difficult for bystanders to notice or intervene.

While in no way blaming or putting the responsibility on women victims, women who communicate their sexual limits more clearly during hookups may be less likely to be victimized. Sexual assertiveness reduces the likelihood of experiencing sexual victimization in general (Kelley, Orchowski, & Gidycz, 2016; Livingston, Testa, & VanZile-Tamsen, 2007) and has been a target of sexual risk reduction programs (e.g., Gidycz et al., 2015; Rowe, Jouriles, McDonald, Platt, & Gomez, 2012). Of particular relevance, Walker et al. (2011) found that higher number of sex partners was associated with increased risk of verbal coercion for women low in sexual assertiveness but not for women high in assertiveness. In the present study, we focused specifically on communication of sexual limits during sexual encounters as the aspect of sexual assertiveness most relevant to hookup-related sexual risk. We hypothesized that the effect of hookups on sexual victimization would be attenuated for women better able to communicate their sexual limits compared to those less able to do so.

Present Study

The present study considered the role of HED and hookups as risk factors for experiencing sexual victimization during the first semester of college. We deliberately used cross-sectional data so that we could determine whether women who engage in risky sexual behavior during the first semester of college experience more sexual victimization during that high risk time. Many studies indicate that risk for sexual victimization is particularly high in the first year or first semester of college (Carey, Durbey, Shepherdson & Carey, 2015; Cranney, 2015; Krebs et al., 2016). We considered whether the relationship between HED and sexual victimization was mediated via hookups. An innovation of our study was examination of the effect of hookups involving alcohol separate from the effect of hookups without alcohol. More frequent HED was expected to be associated with increased sexual victimization primarily due to its association with alcohol-involved hookups but possibly through an association with sober hookups as well. As a secondary goal, we considered whether sexual limit-setting moderates the sexual victimization risk associated with hooking up. We hypothesized that hookups would be positively associated with sexual victimization for women low in sexual limit-setting but that this relationship would be attenuated for women high in sexual limit-setting.

Method

Participants and Recruitment

The sample consisted of 335 first year female college students at a large public university in the Northeast. During the first week of the Spring 2018 semester, email invitations were sent to a random sample of 692 freshman women, ages 18 or 19, who began college in the Fall of 2017. They were invited to participate in a federally funded research study of student

behaviors and beliefs. They were offered \$20 in Campus Cash for completing a 15-minute, confidential web-based survey regarding substance use and sexual behaviors. Women who failed to respond were sent up to four email reminders over the next three weeks. A total of 359 women completed the survey; however, 8 reported that they were not freshmen and 16 failed to finish the survey, yielding 335 completed surveys (48.4% response rate). Participants self-identified as primarily Caucasian (57.9%), Asian (19.7%), and African-American (9.3%), the remainder were mixed race or other. The majority (80.3%) lived on campus. These proportions are highly similar to the University as a whole (e.g., 56.7% Caucasian, 77.0% live on campus). Participants described their sexual orientation as heterosexual/straight (85.1%), bisexual/questioning (11.9%), homosexual/lesbian/gay (2.4%), and 0.6% did not indicate. All were included in analyses.

Procedure and Measures

All procedures were approved by the University at Buffalo Institutional Review Board. After providing online informed consent, participants proceeded to an online survey that was designed to gather information about behaviors and experiences since starting college.

Heavy episodic drinking.—Participants were asked “During the school year, on how many days in a month (out of 30) do you drink alcohol?” Those who drank at least once per month were asked how many drinks they typically consume on an occasion. Women were also asked to report on how many days in a month they drink 4 or more drinks and drink enough alcohol to feel drunk or intoxicated. The two variables were correlated ($r = 0.72$, $p < .001$) and averaged to form a composite HED frequency measure (Testa, Kearns-Bodkin, & Livingston, 2009).

Hookups and Sex Partners.—A hookup was defined as “a sexual encounter between strangers, friends, or acquaintances – people not in a relationship with each other. Some physical interaction (e.g., kissing) is typical but it may or may not involve sexual intercourse”. Participants were asked to indicate how many hookups they had since starting college and then to indicate how many of these hookups had occurred when they were drinking alcohol. Because items were open-ended, there were a few extreme values reported. Women who reported more than 15 hookups (8 participants; 2.4%) or 15 hookups with alcohol (4 participants; 1.2%) were recorded to 15 as the maximum values. By subtracting hookups with alcohol from total hookups we were able to create a variable representing number of hookups without alcohol.

Women were also asked how many sex partners they had since college began (“the total number of people with whom you’ve had vaginal, oral, or anal sex”). As expected, and consistent with prior research indicating that sex partners and hookups are distinct but related facets of risky sexual behavior (see Testa, Hoffman, & Livingston, 2010), the items were positively correlated ($r = 0.64$). It would be inappropriate to combine sex partners and hookups because they may include the same people. Rather, we used sex partners as an alternative measure of sex risk behavior and also created a variable that represented the maximum number of either sex partners or hookups.

Living with parents or relatives.—Because living with parents may be protective against sexual victimization (Tyler et al., 2017) we asked women where they lived during the school year (1 = with parents or other relatives; 0 = dormitory or campus apartment).

Sexual victimization experiences.—Sexual victimization experiences since starting college were assessed using a 12 item measure that was based on the Sexual Experiences Survey (SES; Koss, Gidycz, & Wisniewski, 1987) and subsequently modified by Testa et al. (2010). Items and scoring were identical to those used by Testa et al. (2010) except that anal sex items were omitted. Each tactic (arguments/pressure, physical force, incapacitation) was used as a stem, followed by four potential outcomes (unwanted contact, attempted intercourse, intercourse, oral sex/sex acts) that occurred “when you indicated that you didn’t want to”. For each item, women reported whether it had occurred never, once, or two or more times (scored 0, 1, 2). We computed a severity score based on the most severe act of aggression experienced scored as follows: no victimization (0), contact (1), attempted coercion (2), coercion (3), attempted rape (4), completed rape (5). We also summed the total number of victimization experiences and found, consistent with Testa et al. (2010), that severity was correlated highly with number of experiences ($r = 0.84$).

Sexual Limit-Setting.—Women responded to two items: “I explicitly state at the beginning of a hookup or other sexual encounter how far I want to go” and “I clearly state my limits in a sexual situation”. Items were scored on 6-point scales (from 0 = *Never/Not at all* to 6 = *All the time*). Because the items are relevant only for women with sexual experience, we included a “not applicable” option intended for women without sexual experience. Because the two items were correlated ($r = 0.55$) we used the average for women who answered both ($n = 191$). For women who responded to only one item, we used that response ($n = 58$). The remaining 86 women had missing data on both items (e.g., chose the “not applicable” option); 75 of them reported 0 hookups and 59 reported no sex partners.

Results

Descriptives

Most of the sample ($n = 209$, 62.4%) reported at least one sexual partner since college began (range 0 – 12) and 152 (45.5%) reported at least 1 hookup (range 0 – 15). On average, women reported 1.19 ($SD = 2.64$) hookups involving alcohol (range 0 – 15) and 0.80 ($SD = 1.57$) hookups while sober (range 0 – 10). The majority reported at least one occasion of drinking during a typical month ($n = 212$, 63.3%) and 185 (55.3%) reported at least one occasion of HED. Among women who drank, the average number of drinks per occasion was 3.86 ($SD = 2.02$).

Of 335 participants, 326 completed all items of the SES and of these, 132 (40.4%) reported at least one victimization experience since starting college. The most severe experience was as follows: 30 (9.2%) rape, 18 (5.5%) attempted rape, 16 (4.9%) coercion, 26 (8.0%) attempted coercion, 42 (12.9%) contact and 194 (59.5%) no victimization. Victimization was most likely, and average victimization severity was highest, among women who reported both HED and hooking up (72/119, 60.5%; $M = 1.82$, $SD = 1.93$) and least likely among those with neither HED nor hookups (22/114, 19.3%; $M = 0.46$, $SD = 1.13$).

Victimization rates and average severity for women with HED but not hookups (24/63, 38.1%; $M = 0.84$, $SD = 1.38$) and with hookups but not HED (14/31, 45.2%; $M = 1.48$, $SD = 1.91$) fell in between.

As shown in Table 1, compared to women who were not victimized, women who reported one or more victimization experiences since college started reported higher levels of alcohol and sex risk variables and lower communication of sexual limits. Table 2 displays the bivariate correlations among key variables.

Is the Effect of HED on Sexual Victimization Mediated via Hookups?

We tested the direct and indirect effects of HED on sexual victimization severity using a parallel mediator path analysis model in Mplus Version 7.4 (Muthén, Muthén, & Asparouhov, 2016; Muthén & Muthén, 2015). We used maximum likelihood estimation with robust standard errors. The statistical significance of the indirect effect was tested using 50,000 bootstrap draws to estimate precisely the 95% confidence intervals determined from the lower and upper 2.5 percentiles (Hayes, 2013; MacKinnon, Lockwood, & Williams, 2004). Living with parents was included as a covariate in all models but was not significant in any of them and is not displayed or discussed.

When entered alone, HED predicted sexual victimization ($b = 0.146$, $S.E. = 0.035$, $p < .001$). However, when hookups was included as a mediator, the direct effect from HED to victimization was no longer significant, $b = 0.049$ (0.039), $p = .210$. Rather, there was a significant indirect effect, $b = 0.097$ (0.026), $p < .001$ and 95% bootstrap confidence intervals did not include zero (0.046, 0.148). HED was positively associated with hookups, $b = 0.564$ (0.078), $p < .001$ and hookups predicted sexual victimization, $b = 0.172$ (0.043), $p < .001$. The total estimated effect from HED to sexual victimization severity was $b = 0.146$ (0.035), $p < .001$.

We then considered whether the indirect effect of HED on victimization was specific to alcohol-involved hookups or whether there was an indirect effect via sober hookups as well. As shown in Figure 1, HED was positively associated with alcohol-involved hookups, $b = 0.488$ (0.077), $p < .001$, which in turn predicted sexual victimization severity, $b = 0.180$ (0.058), $p = .002$. HED also predicted hookups without alcohol, $b = 0.076$ (0.031), $p = .014$, which were associated with greater victimization severity, $b = 0.158$ (0.076), $p = .037$. The indirect effect of HED via alcohol-involved hookups was significant, $b = 0.088$ (0.029), $p = .002$ and 95% bootstrap confidence intervals did not include 0 (0.034, 0.150). The path via sober hookups was marginally significant, $b = 0.012$ (0.007), $p = .074$. Results were virtually identical when total number of sexual victimization experiences was used as the outcome.

To ensure that results were robust, we repeated the mediational analysis with two variations: 1) using total sexual partners instead of hookups as the mediator and 2) using the maximum of number of sex partners or hookups as the mediator. Results were nearly identical, although when total sex partners was used as the mediator there was a small direct effect of HED in addition to the significant indirect effect via sex partners. The consistency provides confidence in the pattern of results.

Is the Effect of Hookups on Victimization Moderated by Sexual Limit Setting?

We hypothesized that the effect of hookups on sexual victimization would be moderated by sexual limit-setting, that is, stronger for women lower in sexual limit-setting and attenuated for those higher in limit-setting. We tested this model by entering hookups, sex limits (grand mean centered), and an interaction term (hookups X sex limits). For this analysis, the sample was limited to women who responded to one or both of the sexual limits items ($N = 249$). Hookups predicted sexual victimization severity, $b = 0.316$ (0.081), $p < .001$, but limit-setting did not, $b = -0.069$ (0.066), $p = .294$. The interaction of hookups X limit setting was significant, $b = -0.041$ (0.020), $p = .042$. Following Aiken and West (1991) we created high and low values of the moderator variable corresponding to 1 standard deviation above and below the mean for sex limits. As hypothesized, hookups increased sexual victimization severity for women low in sex limits, $b = 0.228$ (0.047), $p < .001$ but not for women high in sex limits, $b = 0.079$ (0.058), $p = .175$. When we repeated the analysis using total sexual victimization experiences as the outcome the interaction term was not significant, $p = .334$. We also failed to observe a significant interaction or main effect of limit-setting when sex partners or maximum of sex partners and hookups was used.

Discussion

Among first year college women, both HED and hookups were associated with increased odds of sexual victimization and with sexual victimization severity, consistent with several prior studies (e.g., Kingree & Thompson, 2017; Messman-Moore, Coates, Gaffey, & Johnson, 2008; Testa et al., 2010). By considering an indirect effects model, we found that HED's effect on sexual victimization severity was completely mediated via hookups, primarily via alcohol-involved hookups. Thus, our findings indicate that HED's status as a risk factor for victimization is the result of its association with increased sexual risk behaviors. Previous studies have shown drinking and sexual risk behaviors to be closely intertwined (e.g., Claxton et al., 2015; Testa et al., 2010); however, the present findings are unique in suggesting a viable pathway by which women's drinking increases vulnerability, that is, via casual sexual activity.

Hookups involve isolation, sexual expectations, and the potential for misunderstanding and miscommunication of sexual intent, all factors that can contribute to the risk of sexual victimization. The presence of alcohol at the time of sexual activity exacerbates difficulties in perception, communication, and responses (Melkonian & Ham, 2018), while increasing male sexual aggression within sexual encounters (Testa, Brown, & Wang, 2018). Alcohol-involved hookups are also likely to be less well-planned (Livingston, Testa, Windle, & Bay-Cheng, 2015) and more likely to involve partners who are less well-known (LaBrie et al., 2014; Testa & Collins, 1997). Being less well-acquainted with one's hookup partner increases odds of being raped during the event, independent of the effect of drinking at the time (Ford, 2017).

Although number of hookups with alcohol was a robust predictor of sexual victimization severity, hookups without alcohol was also independently, though more modestly associated with victimization as was number of sex partners. These findings serve as a reminder that although hookups are risky situations, any exposure to men in private, sexual contexts

increases vulnerability to victimization. Many sexual assaults are perpetrated by intimate partners (Abbey, Ross, McDuffie, & McAuslan, 1996; Testa, VanZile-Tamsen, & Livingston, 2007) and half occur when the woman is sober (Abbey, 2002).

We found some support for the hypothesis that sexual limit-setting would attenuate the effect of hookups on victimization. However, the interaction between hookups and limit-setting was significant when severity was used as the outcome but not when we used total victimization experiences, despite the high correlation between the two outcomes. Moreover, we failed to observe a main effect of sexual limit-setting, despite prior studies showing a protective effect of sexual assertiveness (Kelley et al., 2016; Livingston et al., 2007). The weak results may reflect our use of a short and non-standard measure of sexual limit-setting; hence replication is necessary.

Limitations

Although our model suggests a plausible pathway by which HED leads to victimization via hookups, these are not event-level data. Women with more frequent HED reported more hookups both with and without alcohol, consistent with person-level differences in risk taking. Thus, we do not know whether sexual victimization experiences occurred during intoxicated hookups, only that women who report more of these experiences report more severe sexual victimization experiences on average. Although HED and hookups are theoretically supported as predictors of victimization, there may be reciprocal effects whereby victimization increases drinking (Rhew, Stappenbeck, Bedard-Gilligan, Hughes, & Kaysen, 2017). The use of ecological momentary assessment (EMA) data would permit more precise ordering and allow for consideration of the event-specific risks of hooking up and drinking on the immediate risk of sexual victimization. Likewise, a longitudinal design examining the effects of hookups in one semester on the occurrence of victimization in a later semester would permit stronger causal inferences. As in any study relying on self-report measures, the accuracy of the data depends on respondents' interpretation of questionnaire items and ability and willingness to report accurately. Finally, findings were obtained using a sample of freshman women at a single university and may not generalize. For example, the strong indirect effect of HED to victimization via alcohol-involved hookups may reflect early college behavioral patterns and requires replication.

Conclusions

Findings support prior research showing the importance of HED and sexual activity as risk factors for college women's sexual victimization while implicating alcohol-involved hookups as a uniquely risky behavior, or at least a potent marker of sexual victimization risk. Moreover, we found that the effect of first semester HED on victimization was completely mediated via hookups. Sexual encounters, which typically occur in private settings without bystanders, appear to be important to understanding college sexual victimization risk. These encounters deserve more research attention to identify whether there are certain aspects that make them particularly risky (e.g., use of alcohol, Ford, 2017) or conversely, reduce their danger (e.g., familiarity with partner, Ford, 2017). Reducing drinking has been advocated as a way of reducing women's vulnerability to incapacitated rape (Testa & Livingston, 2009) and to sexual assault more generally (Farris & Hepner, 2014). However, studies that have

tried this approach, even when successful in reducing drinking, have failed to observe an effect on subsequent victimization (Clinton-Sherrod, Morgan-Lopez, Brown, McMillen, & Cowell, 2011; DiBello & Carey, 2017). In contrast, interventions that have addressed sexual risk behaviors in addition to alcohol have been more successful in reducing sexual victimization (Gilmore, Lewis, & George, 2015; Senn et al., 2015). Our findings support the view that sexual behaviors, particularly alcohol-related sexual behaviors, may be a particularly appropriate target for intervention (see Lewis et al., 2014; Lewis et al., 2018).

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References

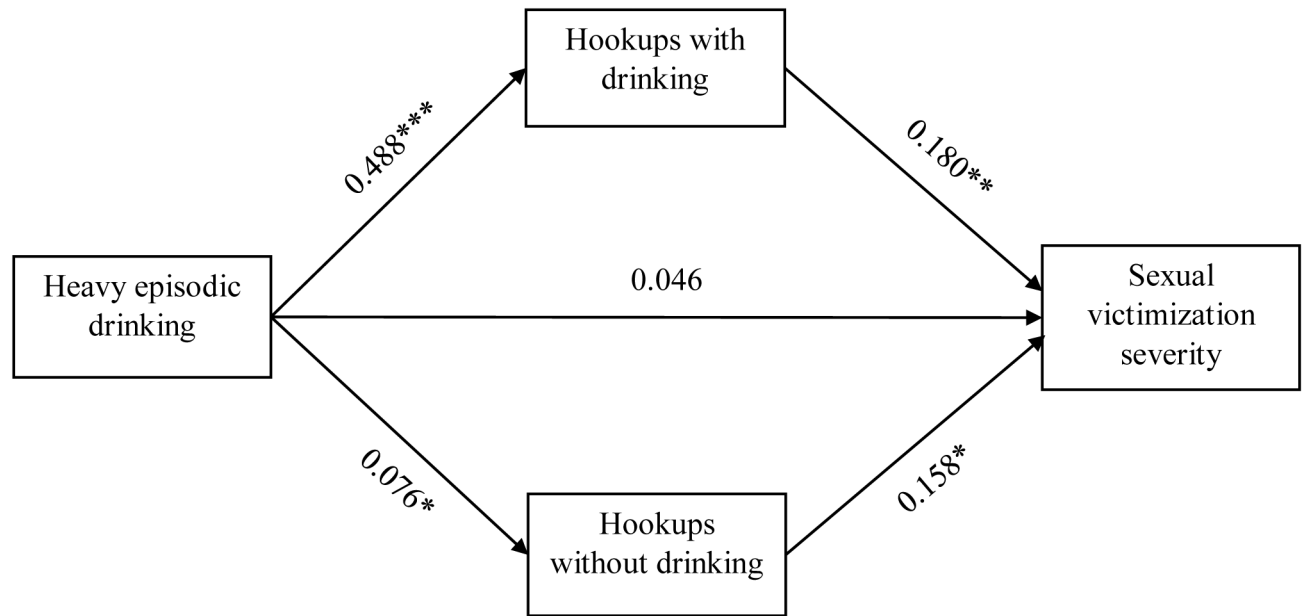
- Abbey A (2002). Alcohol-related sexual assault: A common problem among college students. *Journal of Studies on Alcohol*, Supplement 14(March), 118–128.
- Abbey A, McAuslan P, Zawacki T, Clinton M, & Buck P (2001). Attitudinal, experiential, and situational predictors of sexual assault perpetration. *Journal of Interpersonal Violence*, 16(8), 784–817. doi:10.1177/088626001016008004 [PubMed: 26435575]
- Abbey A, Ross LT, McDuffie D, & McAuslan P (1996). Alcohol and dating risk factors for sexual assault among college women. *Psychology of Women Quarterly*, 20(1), 147–169.
- Abbey A, & Wegner R (2015). Using experimental paradigms to examine alcohol's role in men's sexual aggression: Opportunities and challenges in proxy development. *Violence Against Women*, 21(8), 975–996. [PubMed: 26048214]
- Aiken LS, West SG, & Reno RR (1991). *Multiple regression: Testing and interpreting interactions*. Sage.
- Bersamin MM, Paschall MJ, Saltz RF, & Zamboanga BL (2012). Young adults and casual sex: The relevance of college drinking settings. *Journal of Sex Research*, 49(2–3), 274–281. [PubMed: 21259152]
- Bogle KA (2008). *Hooking up: Sex, dating, and relationships on campus*. New York: NYU Press.
- Carey KB, Durney SE, Shepardson RL, & Carey MP (2015). Incapacitated and forcible rape of college women: Prevalence across the first year. *Journal of Adolescent Health*, 56(5), 678–680. [PubMed: 26003585]
- Clapp JD, Reed MB, Holmes MR, Lange JE, & Voas RB (2006). Drunk in public, drunk in private: The relationship between college students, drinking environments and alcohol consumption. *The American Journal of Drug and Alcohol Abuse*, 32(2), 275–285. doi:10.1080/00952990500481205 [PubMed: 16595328]
- Claxton SE, DeLuca HK, & van Dulmen MHM (2015). The association between alcohol use and engagement in casual sexual relationships and experiences: A meta-analytic review of non-experimental studies. *Archives of Sexual Behavior*, 44(4), 837–856. doi:10.1007/s10508-014-0392-1 [PubMed: 25586945]
- Clinton-Sherrod AM, Morgan-Lopez AA, Brown JM, McMillen BA, & Cowell A (2011). Incapacitated sexual violence involving alcohol among college women: The impact of a brief drinking intervention. *Violence Against Women*, 17(1), 135–154. [PubMed: 21199812]
- Corbin WR, Scott CJ, & Treat TA (2016). Sociosexual attitudes, sociosexual behaviors, and alcohol use. *Journal of Studies on Alcohol and Drugs*, 77(4), 629–637 doi:10.15288/jsad.2016.77.629 [PubMed: 27340968]
- Cranney S (2015). The relationship between sexual victimization and year in school in U.S. colleges: Investigating the parameters of the “Red Zone”. *Journal of Interpersonal Violence*, 30(17), 3133–3145. doi:10.1177/0886260514554425 [PubMed: 25395226]

- DiBello AM, & Carey KB (2017/6). Failure to lower risk of sexual assault after a successful brief intervention Paper presented at the annual meeting of the Research Society on Alcoholism, Denver, CO. doi:10.1080/07448481.2015.1081912.
- Farris C, & Hepner KA (2014). Targeting alcohol misuse: A promising strategy for reducing military sexual assaults? Retrieved from Santa Monica, CA: http://www.rand.org/pubs/research_reports/RR538.html
- Farris C, Treat TA, Viken RJ, & McFall RM (2008). Sexual coercion and the misperception of sexual intent. *Clinical Psychology Review*, 28(1), 48–66. [PubMed: 17462798]
- Fielder RL, Walsh JL, Carey KB, & Carey MP (2014). Sexual hookups and adverse health outcomes: A longitudinal study of first-year college women. *Journal of Sex Research*, 51(2), 131–144. doi: 10.1080/00224499.2013.848255 [PubMed: 24350600]
- Flack W, Daubman KA, Caron ML, Asadorian JA, D'Aureli NR, Gigliotti SN, ... Stine ER (2007). Risk factors and consequences of unwanted sex among university students: Hooking up, alcohol, and stress response. *Journal of Interpersonal Violence*, 22(2), 139–157. doi: 10.1177/0886260506295354 [PubMed: 17202573]
- Flack WF, Hansen BE, Hopper AB, Bryant LA, Lang KW, Massa AA, & Whalen JE (2016). Some types of hookups may be riskier than others for campus sexual assault. *Psychological Trauma: Theory, Research, Practice, and Policy*, 8(4), 413–420. doi:10.1037/tra0000090
- Ford JV (2017). Sexual assault on college hookups: The role of alcohol and acquaintances. *Sociological Forum*, 32(2), 381–405. doi:10.1111/socf.12335
- Franklin CA (2010). Physically forced, alcohol-induced, and verbally coerced sexual victimization: Assessing risk factors among university women. *Journal of Criminal Justice*, 38(2), 149–159.
- George WH, Gournic SJ, & McAfee MP (1988). Perceptions of postdrinking female sexuality: Effects of gender, beverage choice, and drink payment. *Journal of Applied Social Psychology*, 18(15), 1295–1317.
- Gidycz CA, Orchowski LM, Probst DR, Edwards KM, Murphy M, & Tansill E (2015). Concurrent administration of sexual assault prevention and risk reduction programming: Outcomes for women. *Violence Against Women*, 21(6), 780–800. doi:10.1177/1077801215576579 [PubMed: 25845615]
- Gilmore AK, Lewis MA, & George WH (2015). A randomized controlled trial targeting alcohol use and sexual assault risk among college women at high risk for victimization. *Behaviour Research and Therapy*, 74, 38–49. doi:10.1016/j.brat.2015.08.007 [PubMed: 26408290]
- Harrington NT, & Leitenberg H (1994). The relationship between alcohol consumption and victim behaviors immediately preceding sexual aggression by an acquaintance. *Violence and Victims*, 9(4), 315–324. [PubMed: 7577759]
- Hayes AF (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: The Guilford Press.
- Kelley EL, Orchowski LM, & Gidycz CA (2016). Sexual victimization among college women: Role of sexual assertiveness and resistance variables. *Psychology of Violence*, 6(2), 243–252. doi:10.1037/a0039407
- Kingree JB, & Thompson M (2017). Sorority membership and sexual victimization: An examination of potential mediators of the association *Journal of Interpersonal Violence*. Online First August 14, 2017 <http://journals.sagepub.com/doi/pdf/10.1177/0886260517723745>
- Koss MP, Gidycz CA, & Wisniewski N (1987). The scope of rape: Incidence and prevalence of sexual aggression and victimization in a national sample of higher education students. *Journal of Consulting and Clinical Psychology*, 55(2), 162–170. doi:10.1037//0022-006x.55.2.162 [PubMed: 3494755]
- Krebs C, Lindquist C, Berzofsky M, Shook-Sa B, Peterson K, Planty M, ... Stroop J (2016). *Campus Climate Survey Validation Study Final Technical Report*. Retrieved from Washington, DC: <https://www.bjs.gov/content/pub/pdf/ccsvsfr.pdf>
- Krebs CP, Lindquist CH, Warner TD, Fisher BS, & Martin SL (2009). The differential risk factors of physically forced and alcohol- or other drug-enabled sexual assault among university women. *Violence and Victims*, 24(3), 302–321. [PubMed: 19634358]

- LaBrie JW, Hummer JF, Ghaidarov TM, Lac A, & Kenney SR (2014). Hooking up in the college context: The event-level effects of alcohol use and partner familiarity on hookup behaviors and contentment. *Journal of Sex Research*, 51(1), 62–73. doi:10.1080/00224499.2012.714010 [PubMed: 23127230]
- Lewis MA, Granato H, Blayney JA, Lostutter TW, & Kilmer JR (2012). Predictors of hooking up sexual behaviors and emotional reactions among U.S. college students. *Archives of Sexual Behavior*, 41, 1219–1229. [PubMed: 21796484]
- Lewis MA, Patrick ME, Litt DM, Atkins DC, Kim T, Blayney JA, ... Larimer ME (2014). Randomized controlled trial of a web-delivered personalized normative feedback intervention to reduce alcohol-related risky sexual behavior among college students. *Journal of Consulting and Clinical Psychology*, 82(3), 429–440. [PubMed: 24491076]
- Lewis MA, Rhew IC, Fairlie AM, Swanson A, Anderson J, & Kaysen D (2018). Evaluating personalized feedback intervention framing with a randomized controlled trial to reduce young adult alcohol-related sexual risk taking. *Prevention Science*. Online first March 6, 2018 <https://link.springer.com/article/10.1007/s11121-018-0879-4>
- Lindgren KP, Pantalone DW, Lewis MA, & George WH (2009). College students' perceptions about alcohol and consensual sexual behavior: Alcohol leads to sex. *Journal of Drug Education*, 39(1), 1–21. [PubMed: 19886159]
- Livingston JA, Testa M, & VanZile-Tamsen C (2007). The reciprocal relationship between sexual victimization and sexual assertiveness. *Violence Against Women*, 13(3), 298–313. [PubMed: 17322273]
- Livingston JA, Testa M, Windle M, & Bay-Cheng LY (2015). Sexual risk at first coitus: Does alcohol make a difference? *Journal of Adolescence*, 43, 148–158. doi:10.1016/j.adolescence.2015.05.018 [PubMed: 26121927]
- Lorenz K, & Ullman SE (2016). Alcohol and sexual assault victimization: Research findings and future directions. *Aggression and Violent Behavior*, 31, 82–94. doi:10.1016/j.avb.2016.08.001
- Lovejoy MC (2015). Hooking up as an individualistic practice: A double-edged sword for college women. *Sexuality & Culture: An Interdisciplinary Quarterly*, 19(3), 464–492. doi:10.1007/s12119-015-9270-9
- MacKinnon DP, Lockwood CM, & Williams J (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research*, 39(1), 99–128. doi:10.1207/s15327906mbr3901_4 [PubMed: 20157642]
- Mair C, Ponicki WR, & Gruenewald PJ (2016). Reducing risky sex among college students: prospects for context-specific interventions. *AIDS and Behavior*, 20(Suppl 1), 109–118. doi:10.1007/s10461-015-1147-2
- Melkonian AJ, & Ham LS (2018). The effects of alcohol intoxication on college women's identification of risk for sexual assault: A systematic review. *Psychology of Addictive Behaviors*, 32(2), 162–172. [PubMed: 29431464]
- Mellins CA, Walsh K, Sarvet AL, Wall M, Gilbert L, Santelli JS, ... Hirsch JS (2017). Sexual assault incidents among college undergraduates: Prevalence and factors associated with risk. *PLoS ONE*. doi:10.1371/journal.pone.0186471
- Messman-Moore TL, Coates AA, Gaffey KJ, & Johnson CF (2008). Sexuality, substance use and susceptibility to victimization: Risk for rape and sexual coercion in a prospective study of college women. *Journal of Interpersonal Violence*, 23(12), 1730–1746. [PubMed: 18349349]
- Messman-Moore TL, Ward RM, & DeNardi KA (2013). The impact of sexual enhancement alcohol expectancies and risky behavior on alcohol-involved rape among college women. *Violence Against Women*, 19(4), 449–464. [PubMed: 23651639]
- Mouilso ER, Fischer S, & Calhoun KS (2012). A prospective study of sexual assault and alcohol use among first-year college women. *Violence and Victims*, 27(1), 78–94. [PubMed: 22455186]
- Muehlenhard CL, & Linton MA (1987). Date rape and sexual aggression in dating situations: Incidence and risk factors. *Journal of Counseling Psychology*, 34(2), 186–196.
- Muthén BO, Muthén LK, & Asparouhov T (2016). *Regression and mediation analysis using Mplus*. Los Angeles, CA: Muthén & Muthén.

- Muthén LK, & Muthén LK (2015). *Mplus users' guide*: Eighth edition. Los Angeles, CA: Muthén & Muthén.
- Neal DJ, & Fromme K (2007). Event-level covariation of alcohol intoxication and behavioral risks during the first year of college. *Journal of Consulting and Clinical Psychology*, 75(2), 294–306. [PubMed: 17469887]
- Norris J, Nurius PS, & Dimeff LA (1996). Through her eyes: Factors affecting women's perception of and resistance to acquaintance sexual aggression threat. *Psychology of Women Quarterly*, 20(1), 123–145. doi:10.1111/j.1471-6402.1996.tb00668.x . [PubMed: 25705073]
- Owen J, Fincham F, & Moore J (2011). Short-term prospective study of hooking up among college students. *Archives of Sexual Behavior*, 40(2), 331–341. doi:10.1007/s10508-010-9697-x [PubMed: 21203816]
- Parks KA, Hsieh YP, Bradizza CM, & Romosz AM (2008). Factors influencing the temporal relationship between alcohol consumption and experiences with aggression among college women. *Psychology of Addictive Behaviors*, 22(2), 210–218. doi:10.1037/0893-164X.22.2.210 [PubMed: 18540718]
- Parks KA, Hsieh YP, Collins RL, & Levonyan-Radloff K (2011). Daily assessment of alcohol consumption and condom use with known and casual partners among young female bar drinkers. *AIDS and Behavior*, 15, 1332–1341. [PubMed: 20949313]
- Paul EL, & Hayes KA (2002). The causalities of "casual" sex: A qualitative exploration of the phenomenology of college students' hookups. *Journal of Social and Personal Relationships*, 19(5), 639–661.
- Paul EL, McManus B, & Hayes A (2000). "Hookups": Characteristics and correlates of college students' spontaneous and anonymous sexual experiences. *Journal of Sex Research*, 37(1), 76–88.
- Rhew IC, Stappenbeck CA, Bedard-Gilligan M, Hughes T, & Kaysen D (2017). Effects of sexual assault on alcohol use and consequences among young adult sexual minority women. *Journal of Consulting and Clinical Psychology*, 83(5), 424–433. doi:10.1037/ccp0000202
- Rowe LS, Jouriles EN, McDonald R, Platt CG, & Gomez GS (2012). Enhancing women's resistance to sexual coercion: A randomized controlled trial of the DATE program. *Journal of American College Health*, 60(3), 211–218. doi:10.1080/07448481.2011.587068 [PubMed: 22420698]
- Scaglione NM, Turrisi R, Mallett KA, Ray AE, Hultgren BA, & Cleveland MJ (2014). How much does one more drink matter? Examining effects of event-level alcohol use and previous sexual victimization on sex-related consequences. *Journal of Studies on Alcohol and Drugs*, 75, 241–248. [PubMed: 24650818]
- Senn CY, Eliasziw M, Barata PC, Thurston WE, Newby-Clark IR, Radtke HL, & Hobden KL (2015). Efficacy of a sexual assault resistance program for university women. *New England Journal of Medicine*, 372, 2326–2335. doi:10.1056/NEJMsa1411131 [PubMed: 26061837]
- Testa M, & Collins RL (1997). Alcohol and risky sexual behavior: Event-based analyses among a sample of high-risk women. *Psychology of Addictive Behaviors*, 11(3), 190–201.
- Testa M, Brown WC, & Wang W (2018). Do men use more sexually aggressive tactics when intoxicated? A within-person examination of naturally-occurring episodes of sex. *Psychology of Violence*. Online first April 9 2018. 10.1037/vio0000186
- Testa M, Hoffman JH, & Livingston JA (2010). Alcohol and sexual risk behaviors as mediators of the sexual victimization-revictimization relationship. *Journal of Consulting and Clinical Psychology*, 78(2), 249–259. [PubMed: 20350035]
- Testa M, Kearns-Bodkin JN, & Livingston JA (2009). Effect of pre-college drinking intentions on women's college drinking as mediated via social influences. *Journal of Studies on Alcohol and Drugs*, 70(4), 575–582. [PubMed: 19515298]
- Testa M, & Livingston JA (2009). Alcohol consumption and women's vulnerability to sexual victimization: Can reducing women's drinking prevent rape? *Substance Use & Misuse*, 44(9), 1349–1376. doi:10.1080/10826080902961468 . [PubMed: 19938922]
- Testa M, Parks KA, Hoffman JH, Crane CA, Leonard KE, & Shyhalla K (2015). Do drinking episodes contribute to sexual aggression in college men? *Journal of Studies on Alcohol and Drugs*, 76(4), 507–515. doi:10.15288/jsad.2015.76.507 . [PubMed: 26098025]

- Testa M, VanZile-Tamsen C, & Livingston JA (2007). Prospective prediction of women's sexual victimization by intimate and nonintimate male perpetrators. *Journal of Consulting and Clinical Psychology*, 75(1), 52–60. [PubMed: 17295563]
- Thompson EH, & Cracco EJ (2008). Sexual aggression in bars: What college men can normalize. *The Journal of Men's Studies*, 16(1), 82–96. doi:10.3149/jms.1601.82 .
- Turchik JA, & Hassija CM (2014). Female sexual victimization among college students: Assault severity, health risk behaviors, and sexual functioning. *Journal of Interpersonal Violence*, 29(13), 2439–2457. [PubMed: 24505086]
- Tyler KA, Schmitz RM, & Adams SA (2017). Alcohol expectancy, drinking behavior, and sexual victimization among female and male college students *Journal of Interpersonal Violence*, 37(15), 2298–2232.
- Ven TV, & Beck J (2009). Getting drunk and hooking up: An exploratory study of the relationship between alcohol intoxication and casual coupling in a university sample. *Sociological Spectrum*, 29(5), 626–648.
- Walker DP, Messman-Moore TL, & Ward RM (2011). Number of sexual partners and sexual assertiveness predict sexual victimization: Do more partners equal more risk? *Violence and Victims*, 26(2), 774–787. [PubMed: 22288095]



Path coefficients are unstandardized. The parallel mediators were allowed to be correlated.

*** $p < .001$, ** $p < .01$, * $p < .05$

Figure 1.

Indirect Effects of Heavy Episodic Drinking on Sexual Victimization via Hookups

Table 1.
Comparison of Women With and Without First Semester Sexual Victimization (N = 326)

Descriptive Statistics Variable	No sexual victimization (N = 194)			Some sexual victimization (N = 132)			t(df)
	Min	Max	Mean (S.D.)	Min	Max	Mean (S.D.)	
1. Heavy episodic drinking days per month	0.00	16.00	1.48 (2.71)	0.00	15.00	3.29 (3.55)	5.204 (324) ***
2. Drinks per drinking occasion ¹	0.00	10.00	1.84 (2.19)	0.00	12.00	3.35 (2.59)	5.673 (323) ***
3. Number of hookups	0.00	15.00	1.14 (2.40)	0.00	15.00	3.22 (4.04)	5.812 (323) ***
4. Hookups with drinking	0.00	13.00	0.48 (1.48)	0.00	15.00	2.23 (3.50)	6.196 (323) ***
5. Hookups without drinking	0.00	10.00	0.66 (1.50)	0.00	8.00	0.99 (1.65)	1.831 (323)
6. Number of sexual partners	0.00	6.00	0.85 (1.01)	0.00	12.00	1.97 (2.45)	5.697 (323) ***
7. Sexual limits ²	0.00	6.00	4.19 (1.83)	0.00	6.00	3.70 (1.78)	-2.139 (247) *
8. Total SES items	0.00	0.00	0.00 (0.00)	1.00	20.00	4.06 (3.63)	-
9. Sexual victimization severity	0.00	0.00	0.00 (0.00)	1.00	5.00	2.76 (1.57)	-

 $p < .001$,

**
 $p < .01$,

*
 $p < .05$

Note:

¹ Women who reported no drinking occasions scored 0

² Based on 249 women who answered at least 1 item

Table 2.

Bivariate Correlations among Primary Variables

Correlations	1	2	3	4	5	6	7	8	9
1. Heavy episodic drinking	--								
2. Drinks per occasion	**	--							
3. Number of hookups	**	0.37	--						
4. Hookups with drinking	**	0.42	**	--					
5. Hookups without drinking	**	0.08	0.63	**	--				
6. Number of sexual partners	**	0.38	0.64	**	0.52	**	--		
7. Sexual limits (N = 249)	**	-0.21	-0.10	-0.16	0.06	-0.07	--		
8. Sexual victimization (TOT)	**	0.22	0.42	**	0.29	**	**	-0.14	--
8. Sexual victimization (severity)	**	0.28	0.39	**	0.36	**	**	-0.17	**
					0.21	0.39	**	0.84	**

**
 $p < 0.01$,*
 $p < .05$