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Do Alcohol and Marijuana Increase the Risk for Female Dating Violence Victimization? A Prospective Daily Diary Investigation

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Abstract

Objective—Dating violence is a serious and prevalent problem, with females being victimized by partners at high rates with numerous negative health consequences. Previous research has been equivocal on whether substance use on the part of the victim temporally precedes and, thus, increases the odds of victimization. While the sole responsibility for violence is always with the perpetrator, knowing this information could provide useful information for theory as well as interventions designed to keep women safe.

Method—Participants were female college students in a current dating relationship who had consumed alcohol in the previous month ($N = 173$). Students completed daily surveys on their violence victimization, alcohol use, and marijuana use for up to 90 consecutive days.

Results—On any drinking days, heavy drinking days, and as the number of alcoholic drinks consumed increased, women were more likely to be victimized by psychological, physical, and sexual dating violence. Marijuana use also preceded and increased the odds of sexual victimization. Relationship length moderated some of these temporal associations, such that the odds of victimization on a drinking day, or marijuana use day, were increased for participants in longer relationships.

Conclusions—Findings underscore the importance of considering the role that alcohol and marijuana use play in increasing the risk for dating violence victimization among women. Intervention programs for dating violence may benefit by attempting to decrease substance use in order to reduce risk for female victims.

Keywords

Dating violence; alcohol; marijuana; victimization

It is well established that female dating violence victimization is a serious problem during college. For instance, each year it is estimated that 80% of college women will be victimized by psychological aggression from a current dating partner, 20–30% will be victimized by

physical aggression, and up to 30% will be victimized by sexual aggression (Shorey, Cornelius, & Bell, 2008). Not surprisingly, dating violence victimization is associated with a wealth of negative health outcomes, including, but not limited to, depression (Kaura & Lohman, 2007), posttraumatic stress symptoms (Harned, 2001), suicidal ideation and self-injurious behaviors (Chan, Straus, Brownridge, Tiwari, & Leung, 2008), and physical injuries (Amar & Gennaro, 2005). Although some research suggests women are as likely as men to perpetrate psychological and physical aggression against a dating partner (Shorey, Brasfield, Febres, & Stuart, 2011; Straus, 2008), female victimization tends to result in more physical injuries relative to male victimization (Archer, 2000) and may also result in more severe mental health outcomes for women compared to men (Caldwell, Swan, & Woodbrown, 2012).

As related to the current study, research has demonstrated substance use, most notably alcohol use, to be associated with female dating violence victimization. In a recent review of the cross-sectional literature on dating violence and substance use among college students, Shorey, Stuart, and Cornelius (2011) concluded that victims of dating violence, including psychological, physical, and sexual, are at risk for increased alcohol use and alcohol-related problems. Unfortunately, this research does not elucidate the direction of the relationship between alcohol use and dating violence victimization. Although the authors' language implies that dating violence victimization increase the risk for alcohol use, it is also, or alternatively, possible that alcohol temporally precedes and increase the risk for dating violence victimization. Moreover, Shorey and colleagues (2011) noted that there is scant research on the relationship between dating violence victimization and drug use, with the authors calling for more research in this area. Because alcohol and marijuana are the most frequently used substances among college women (Johnston, O'Malley, Bachman, & Schulenberg, 2013), the current paper will focus exclusively on these two substances and their association with dating violence victimization. Specifically, we examined the temporal relationship between alcohol and marijuana use and dating violence victimization among college women utilizing a 90-day daily diary design.

Theoretical Considerations: Substance use and Dating Violence Victimization

The theoretical link between substance use and dating violence, or intimate partner violence, victimization is unclear. As noted in the previous section, one possible explanation for the association between substance use and dating violence victimization is that victims use substances in the aftermath of violence, namely as a mechanism to cope with their victimization experiences (e.g., Epstein, Saunders, Kilpatrick, & Resnick, 1998; Messman-Moore & Long, 2000). Indeed, research has demonstrated that alcohol use increases in the 24 hours following verbal aggression experiences among college women (Parks, Hsieh, Bradizza, & Romosz, 2008). However, some longitudinal research demonstrates victimization by a partner does not predict future substance use (Devries et al., 2014).

Supporting the alternative causal direction, proximal effects theories of substance use and violence (e.g., Leonard & Quigley, 1999) provide some theoretical reason to expect that

substance use temporally precedes and, therefore, increases the risk for victimization. Specifically, these models posit that substance use increases the risk for victimization through its acute effects by impairing cognitive and physical functioning, such as decreasing risk perception for violence (Cattaneo, Bell, Goodman, & Dutton, 2007). This theoretical supposition should not be construed as an attempt to blame violence on victims who are under the influence of substances. It is our belief, and that of others (e.g., Cattaneo & Goodman, 2005), that the sole responsibility for violence is always that of the perpetrator. Still, examining the theoretical proposition that substance use increases the risk for dating violence victimization may have important implications for our understanding of violence and for interventions designed to decrease the chances for victimization and ultimately keep women safe.

Temporal Association between Alcohol, Marijuana, and Violence Victimization

To date, only a few studies have investigated whether alcohol and drug use temporally precede and increase the risk for violence victimization from an intimate partner. Stuart and colleagues (2013) demonstrated that the odds of physical violence victimization was increased on drinking days (OR = 5.22) and heavy drinking days (OR = 6.16) relative to non-drinking days, and with each additional drink consumed (OR = 1.13), among women arrested for domestic violence and court-referred to batterer intervention programs. Marijuana use, relative to non-use, was associated with *decreased* odds (OR = 4.13) of sexual victimization. Testa and Derrick (2014) demonstrated the odds of physical and verbal victimization increased when alcohol had been consumed in the previous 4 hours among a community sample of married or cohabitating couples who provided 56 days of daily diaries. This study did not examine marijuana use or sexual victimization.

In an 8-week prospective daily diary study with college women, Parks and colleagues (2008) demonstrated that physical (OR = 11.84), verbal (OR = 2.25), and sexual (OR = 19.44) aggression were more likely to occur on heavy drinking days relative to non-drinking days. Unfortunately, this study has several notable limitations. First, the authors combined reports of perpetration and victimization; they did not differentiate between violence that occurred with an intimate partner, acquaintance, or stranger; approximately half of their sample was comprised of women with severe victimization histories and/or heavy alcohol consumption; and they did not examine or control for the effects of marijuana. Testa and Livingston (2009) reviewed the research on alcohol use and sexual assault victimization, which was not necessarily from a dating partner, and concluded that alcohol use by women is proximally related to their sexual victimization. However, this review only contained a few studies establishing the temporal relationship between alcohol use and sexual assault. Thus, it is clear that there is a need for additional research that clearly examines whether alcohol and marijuana *temporally precede* and increase the risk of dating violence victimization among college women, a population at great risk for dating violence and substance use.

An additional limitation of all prior research is that none has examined characteristics of the intimate relationship that may moderate the temporal association between substance use and

dating violence victimization. In the current study, we examined whether relationship length may be one characteristic of the intimate relationship that impacts this temporal association. Previous research has demonstrated relationship length to be positively associated with dating violence (Luthra & Gidycz, 2006; Marcus & Swett, 2002; Shorey, Febres, Brasfield, & Stuart, 2012), suggesting that the risk for dating violence victimization increases over time. This may be due to satisfaction decreasing over the course of a relationship (e.g., McNulty, Olson, Meltzer, & Shaffer, 2013) and individuals in shorter relationships having a strong desire to be perceived positively by their partner (e.g., Swann et al., 1994). Thus, as the relationship progresses, and as satisfaction and the desire to be perceived positively by ones' partner decreases, the risk for violence between partners is likely enhanced. Therefore, it is possible that the odds of victimization on an alcohol or marijuana use day will be increased for individuals in longer, relative to shorter, relationships. Knowing this information may have important implications for our theoretical understanding of substance use and violence victimization and implications for interventions aimed at keeping women safe.

Current Study

Improving upon the limitations of prior research on the association between substance use and dating violence victimization, the present study investigated whether (1) alcohol use and marijuana use *temporally preceded* and increased the odds of psychological, physical, and sexual dating violence victimization and (2) whether relationship length moderated these associations. To accomplish these goals, we utilized a 90-day, prospective daily diary design with dating college women. Daily diary designs can provide a more sensitive and accurate assessment of behavior and situations that may vary from day to day (Shiffman, Stone, & Hufford, 2008), such as violence and substance use. Thus, this methodology is particularly well suited for studies on the temporal relationship between substance use and violence between intimate partners. Based on theory and previous research, we hypothesized that alcohol use would temporally increase the odds of dating violence victimization, and that this association would be stronger for individuals in longer, relative to shorter, relationships. Due to the extant and inconsistent literature on the temporal relationship between marijuana and violence victimization, we made no a priori hypothesis concerning this relationship.

Method

Participants

Female undergraduate students from a large, public, university in the Southeastern United States participated. Eligibility requirements included (a) be at least 18 years of age, (b) be in a current dating relationship with a partner who was at least 18 years old that had lasted at least one month in duration, (c) have an average of at least 2 face-to-face contact days with their dating partner each week, and (d) have consumed alcohol in the previous month. It is very common for studies on dating violence to require the relationship to be at least one month in duration in order to participate (e.g., Moore et al., 2011; Shorey et al., 2012). This resulted in 284 students meeting eligibility. Of these students, 194 (68.3%) agreed to participate in an initial one-hour survey session which involved completing self-report

instruments that examined personal characteristics (e.g., demographic information; personality traits). All women were then invited to participate in the 90-day daily diary study. One hundred and seventy seven women (91.2%) began the diary portion. The sample for the current study consists of 173 students with at least one day of face-to-face contact with their partner over the 90 days. This sample has been described elsewhere, in a study that examined the temporal relationship between alcohol use and dating violence perpetration (Shorey, Stuart, Moore, & McNulty, 2014).

The mean age of participants was 18.71 ($SD = 1.27$) and the average length, in months, of their current dating relationship was 16.39 ($SD = 13.61$). Most of the sample was not currently living with their dating partner (96.5%) and identified as heterosexual (95.9%). The academic makeup was first year students (69.4%), sophomores (15.0%), seniors (8.1%), and juniors (7.5%). The ethnic composition of the sample was primarily non-Hispanic Caucasian (85.5%), followed by African American (8.7%), and “other” (e.g., Hispanic, Asian American; 5.8%).

Procedure

Participants were recruited from an online study website used exclusively by the Psychology department at the institution where the study was conducted. Students enrolled in undergraduate Psychology courses had the opportunity to read a brief description of the study, indicating they would be asked to answer questions daily about a current intimate relationship, and would receive financial compensation for their participation. Interested students then completed a brief screening measure (described above) to determine eligibility. Eligible students were then sent an electronic informed consent and a link to an online survey to complete the baseline assessment. Participants completed the informed consent and baseline assessment on SurveyMonkey.com. After the baseline assessment was complete, students began the daily diary portion of the study the following day. Each daily survey was also completed on SurveyMonkey.com. Participants received an email at the same time each day (12:00 a.m.) that contained a link to that day’s survey and a reminder email to complete their survey if they had not completed it by 5p.m. Each set of questionnaires asked participants to report about their previous day’s behavior, defined as the time elapsed from when they awoke until they went to sleep, and took approximately 5 minutes to complete. Participants received .50 cents for each completed daily survey as compensation. In addition, and as an incentive to increase compliance, participants who completed 70% or more of the daily surveys were entered into random drawings for a \$100.00 gift card to an online retailer. These procedures were approved by the Institutional Review Board of the last author’s institution.

Daily Questions

Contact with Dating Partner—Each day participants indicated whether they had face-to-face contact with their partner during the previous day. Participants reported on the same partner every day, regardless of whether that relationship was intact or whether they had begun dating a different partner. This was done because prior research suggests that violence occurs even after relationship termination and may increase in frequency and severity after termination (Anderson, 2003).

Dating Violence Victimization—Participants were asked to answer questions about their psychological, physical, and sexual dating violence victimization on days when they had face-to-face contact with their dating partner. The Revised Conflict Tactics Scales (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996; Straus, Hamby, & Warren, 2003) was used to examine psychological, physical, and sexual aggression victimization. For each type of dating violence, every CTS2 item corresponding to that particular form of dating violence was presented to participants as a single item. For example, psychological dating violence victimization was assessed using the following question: “Threatened to hit or throw something at partner; destroyed something belonging to partner; did something to spite partner; accused partner of being a lousy lover; called partner names (e.g., fat, ugly, asshole, etc.); insulted/swore at partner; yelled/screamed at partner.” All victimization questions were answered using a “Yes/No” format and women were asked if any of the items in each question had occurred during the previous day. It was not possible for women to report on different episodes of dating violence victimization daily. Participants who reported they had been victimized by these behaviors at any time that day were coded with a “1” and participants who reported they had not been victimized by these behaviors at any time that day were coded with a “0.” This was done for each type of victimization separately. This method of assessing violence dichotomously is consistent with all temporal studies on substance use and dating violence (Moore et al., 2011; Rothman et al., 2012; Shorey et al., 2014).

Alcohol Use—Each day participants were asked how many standard drinks of alcohol they consumed. Participants were provided with a description of a standard drink to assist in reporting (e.g., one 12 ounce beer). If dating violence victimization occurred, participants were also asked to indicate whether they had consumed any alcohol immediately prior to victimization and, if so, how many standard drinks they consumed. We created a dummy code that indicated whether or not participants drank alcohol before any dating violence victimization occurred, such that days in which people drank alcohol before violence were coded with a “1”, days on which participants drank alcohol but were not victimized were coded with a “1”, and days on which participants did not drink alcohol were coded with a “0.” To prevent days on which people drank alcohol after, but not before, violence from inflating any associations, we also coded such days with a “0.” This method of coding alcohol is consistent with prior studies on the temporal association between alcohol and dating violence (e.g., Moore et al., 2011; Shorey et al., 2014). An index of the number of drinks consumed was based on the number of drinks women reported consuming on a particular day. If alcohol was consumed both prior to and after victimization, only the number of drinks consumed prior to victimization was included in the index of number of drinks consumed. A dummy code was also created that differentiated heavy drinking days. That is, days on which participants reported consuming 4 or more standard drinks, which is considered heavy drinking for females [National Institute on Alcohol Abuse and Alcoholism (NIAAA), 1995], were coded with a “1” and all other days were coded with a “0”. The alcohol dummy codes were separate from the violence dummy codes.

We decided to use three indicators of alcohol use to determine whether different levels of alcohol use increased the risk for dating violence victimization. For instance, does any

alcohol use increase the risk of IPV victimization (e.g., 1 drink; 3 drinks; 15 drinks)? Or is it only heavy alcohol use (4 or more drinks)? Also, does the risk for IPV victimization further increase with every drink of alcohol consumed (number of drinks)? Thus, although all three indicators of alcohol use are related, they also provide important, and different, information. Moreover, as this is a preliminary study in this area, presenting more information concerning the temporal relationship between alcohol and IPV victimization is important to advance the field.

Marijuana Use—Each day participants indicated whether they had used marijuana and, if victimization occurred, whether they had used marijuana immediately prior to victimization. Marijuana use was dummy coded the same way alcohol use was dummy coded. Consistent with alcohol, days when marijuana use occurred following victimization were recoded into non-marijuana use days.

Partner Substance Use—On victimization days only, participants were asked whether their partner had consumed alcohol (Yes/No) or marijuana (Yes/No) prior to them perpetrating violence. On non-violence days, these questions were not included.

Data Analytic Strategy

Multilevel modeling was used to examine whether the odds of being victimized by psychological, physical, and sexual victimization were (a) higher on drinking days relative to non-drinking days (and higher with greater alcohol consumption; and higher on heavy drinking days relative to non-heavy drinking days), (b) higher on marijuana use days relative to non-use days, and (c) whether relationship length moderated the temporal relationship between alcohol [marijuana] and dating violence victimization. To estimate the unique associations between victimization, drinking, and marijuana use, we regressed each form of victimization, one at a time, onto each drinking variable, one at a time, and marijuana. That is, the three indicators of alcohol use were not included in the same models. Given that both between- and within-person differences in substance use may be related to aggression, all drinking variables and marijuana use were uncentered (see Raudenbush & Bryk, 2002). Finally, we examined whether relationship length moderated the temporal association between drinking [marijuana use] and victimization by including relationship length in the second level of the model. For these analyses relationship length was coded as the number of years dating and then mean-centered prior to being added to the models, and significant interactions were probed at high (+1 SD) and low (−1SD) levels of relationship length (Aiken & West, 1991). All multilevel models were estimated using HLM 7 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011). All intercepts and slopes were specified as random across individuals and a logit link function was specified using a Bernoulli sampling distribution due to the dichotomous outcome variables.

Results

Daily Diary Descriptive Statistics

A total of 9,477 daily surveys, which represents a 61% compliance rate, were completed by participants. Eighty-six participants (49.7%) completed surveys on 61 or more days; forty-

seven (27.1%) completed between 30–60 surveys; thirty-six (20.8%) completed between 10–29 surveys; and four (2.4%) completed less than 10 surveys. Therefore, 76.8% of the sample provided at least 30 days of data. Because physical and sexual victimization are only possible on face-to-face contact days, days where no face-to-face contact occurred were omitted from analyses (4,729 days), consistent with prior research (Elkins et al., 2013; Moore et al., 2011; Shorey et al., 2014). Thus, the final data set included 4,748 daily surveys that involved face-to-face contact between the 173 participants and their dating partners. Across the face-to-face contact days, participants reported a total of 129 acts of psychological victimization, 47 acts of physical victimization, 24 acts of sexual victimization, 654 drinking days, 337 heavy drinking days, 221 marijuana use days, and 74 days that contained both alcohol and marijuana use. During the course of the study, 21 women reported that they were no longer in a dating relationship. These women reported having a total of 121 days where they had face-to-face contact with their partner despite no longer dating.

Women reported that they had consumed alcohol prior to 14.7% of their psychological victimization experiences, 17% of their physical victimization experiences, and 20.8% of their sexual victimization experiences. For marijuana, women reported consuming this drug prior to 6.9%, 0%, and 12.5% of their psychological, physical, and sexual victimization experiences, respectively. Women reported that their male partners consumed alcohol and marijuana, respectively, prior to 16.3% and 8.5% of psychologically aggression episodes; 8.5% and 6.4% of physically aggressive episodes; and 12.5% and 16.7% of sexually aggressive episodes. Because we did not collect data on male partner's substance use on non-violence days, we were unable to examine male partner's substance use in the multilevel models.

We examined whether the number of survey days completed was associated with daily reports of dating violence victimization and substance use. The number of survey days completed was not associated with psychological or sexual dating violence victimization or alcohol and marijuana use. The number of survey days completed was associated with daily reports of physical victimization ($t = 2.43$; $p < .05$; $B = .01$; $SE = .00$; $OR = 1.01$; 95% $CI = 1.00, 1.02$).

Main Effects of Alcohol and Marijuana on Victimization

As displayed in Table 1, results of the main effect analyses demonstrated that all three indicators of alcohol use (any drinking, heavy drinking, and number of drinks consumed) increased the daily odds of psychological, physical, and sexual dating violence victimization. For instance, for physical victimization and the number of drinks consumed, results demonstrated that for each additional drink consumed, the odds of physical victimization increased by 10%. For heavy drinking and physical victimization, the odds of being victimized was 2.05 times more likely on heavy drinking days relative to non-heavy drinking days. Marijuana use increased the daily odds of psychological aggression victimization in one of the three models and increased the odds of sexual victimization in two of the three models. The models for physical aggression would not converge when

marijuana was included and, thus, marijuana was precluded from analyses with physical aggression.

Because daily alcohol and daily marijuana were not mutually exclusive, we attempted to examine the interactive effect of alcohol and marijuana on the daily odds of dating violence victimization. However, the majority of these models would not converge, likely due to multicollinearity. Moreover, the interaction models that would converge were not significant.

Moderating Effect of Relationship Length

We first examined the main effect of relationship length on the daily odds of violence victimization. Results demonstrated that relationship length was negatively associated with the daily odds of physical ($t = -3.61$; $p < .001$; $B = -.31$; $SE = .08$; $OR = .72$; 95% CI = .61, .86) and sexual victimization ($t = -4.83$; $p < .001$; $B = -.07$; $SE = .15$; $OR = .46$; 95% CI = .34, .63), but unrelated to psychological victimization ($t = .41$; $p > .05$; $B = .03$; $SE = .08$; $OR = 1.03$; 95% CI = .88, 1.21).

Relationship length only moderated the temporal association between heavy drinking and psychological aggression victimization (see Table 2). Specifically, heavy drinking did not increase the odds of victimization at longer relationship length ($t = .86$; $p > .05$; $B = .14$; $SE = .16$; $OR = 1.15$; 95% CI = .83, 1.58) but did at shorter relationship length ($t = 4.74$; $p < .001$; $B = .64$; $SE = .13$; $OR = 1.89$; 95% CI = 1.45, 2.47). Relationship length also significantly moderated the temporal association between marijuana use and psychological victimization in all three models. Specifically, for the model controlling for heavy drinking, marijuana increased the odds of victimization at longer relationship length ($t = 4.30$; $p < .001$; $B = .41$; $SE = .09$; $OR = 1.51$; 95% CI = 1.25, 1.82) but not at shorter relationship length ($t = -1.15$; $p > .05$; $B = -.20$; $SE = .17$; $OR = .81$; 95% CI = .57, 1.15). The output for the models that controlled for alcohol use and number of drinks are similar to the one presented that controlled for heavy drinking. All output is available from the first author upon request.

For physical aggression victimization, relationship length moderated the temporal association between number of drinks consumed and heavy drinking and victimization (Table 2). Specifically, the number of drinks consumed increased the odds of victimization to a greater degree at longer relationship length, ($t = 6.74$; $p < .001$; $B = .15$; $SE = .02$; $OR = 1.16$; 95% CI = 1.12, 1.22) than at shorter relationship length ($t = 5.11$; $p < .001$; $B = .10$; $SE = .02$; $OR = 1.10$; 95% CI = 1.06, 1.5). Heavy drinking increased the odds of victimization at longer relationship length ($t = 7.95$; $p < .001$; $B = 1.48$; $SE = .18$; $OR = 4.43$; 95% CI = 3.06, 6.42) but not at shorter relationship length ($t = .54$; $p > .05$; $B = .08$; $SE = .16$; $OR = 1.09$; 95% CI = .79, 1.49).

Finally, for sexual victimization, results demonstrated that relationship length moderated the temporal association between any alcohol use and number of drinks consumed and the odds of sexual victimization (Table 2). Specifically, any alcohol use increased the odds of victimization to a greater degree at longer relationship length ($t = 11.83$; $p < .001$; $B = .95$; $SE = .08$; $OR = 2.58$; 95% CI = 2.21, 3.04) than at shorter relationship length ($t = 6.70$; $p < .001$; $B = .63$; $SE = .09$; $OR = 1.88$; 95% CI = 1.56, 2.27). Similarly, the number of drinks

consumed increased the odds of victimization to a greater degree at longer relationship length ($t = 10.31$; $p < .001$; $B = .13$; $SE = .01$; $OR = 1.14$; $95\% CI = 1.12, 1.17$) than at shorter relationship length ($t = 4.34$; $p < .001$; $B = .07$; $SE = .01$; $OR = 1.08$; $95\% CI = 1.04, 1.12$). Relationship length did not moderate the temporal association between having drinking or marijuana use and sexual victimization.

Discussion

The temporal association between substance use, particularly alcohol, and dating violence perpetration, including dating violence, is well documented. In contrast, there are only a handful of studies on the temporal association between alcohol, marijuana, and dating violence victimization, and the theoretical literature on this temporal association is unclear. Thus, we examined this temporal association among a large sample of currently dating college women using a prospective daily diary design.

Findings demonstrated that the odds of psychological, physical, and sexual dating violence victimization were increased when alcohol was consumed prior to aggression. These findings were confirmed for any alcohol use, heavy alcohol use (4 or more drinks), and as the number of drinks consumed increased. Conceptually, this suggests that any amount of alcohol may increase the risk for victimization, and that this risk increases with each additional drink of alcohol consumed. It is important to note that each indicator of alcohol use (any, heavy, and number of drinks) provides insight regarding the relationship between alcohol use and victimization via different metrics. Thus, each construct will demonstrate associations that differ in magnitude and require different interpretations (e.g., one drink compared to drinking versus not drinking). Thus, it is important to consider the unit of measurement for alcohol and how this may impact interpretation of the alcohol and victimization odds ratios.

It is also interesting to note that the percentage of victimization experiences preceded by alcohol use in the current study is considerably lower than typically reported in studies of sexual assault among college women, which is often around 50% of victimization experiences (Abbey, 2002). One reason for this difference is that we focused on victimization from a dating partner whereas studies on sexual assault generally assess victimization from a number of different people (e.g., acquaintances, partner, stranger). These differences in the relationship between the perpetrator and the victim, as well as different base rates in drinking across populations, may account for this variation across studies. Thus, although the percentage of victimization incidents preceded by alcohol was lower in the current study relative to studies on sexual assault, our findings demonstrate that alcohol is associated with an increased risk of dating violence victimization.

Interestingly, marijuana use also preceded and increased the odds for sexual victimization and for psychological victimization in one model, which is counter to previous research with women arrested for domestic violence suggesting marijuana decreases the odds of victimization (Stuart et al., 2013). Although the research in this area is nascent and needs replication, these findings lend support to the theoretical supposition that acute alcohol use, and in some cases acute marijuana use, precede and increase the odds for dating violence

victimization. Although it is still possible victims consume alcohol or marijuana after violence victimization, in an attempt to cope with the aftermath of violence (Epstein et al., 1998), these findings help to advance our theoretical understanding of the proximal effect of substance use on dating violence victimization.

One question that the current study cannot answer is the mechanism(s) responsible for substance use increasing the odds of victimization. Proximal effects theories of alcohol use and violence perpetration (e.g., Leonard, 1993) would posit that substance use decreases information processing capabilities, narrowing the focus of attention to the most relevant stimuli (e.g., negative affect, hostile thoughts), thus increasing the risk for aggression. It is possible that some analogous factors are important in trying to elucidate the mechanisms that put drinking women at risk for victimizations. For example, some researchers have suggested that the cognitive impairments associated with drinking can lead to difficulties in the perception of risk as well as the ability to plan and implement complex and effective strategies to escape dangerous situations (Cattaneo et al., 2007; Nurius, 2000). Further, with respect to sexual victimization, it has also been suggested that men tend to misperceive women's alcohol use as a sign that they are interested in sex or are at least open to sexual overtures (Abbey, McAuslan, & Ross, 1998). Additionally, as previously stated, one possibility is that it is the substance use of the perpetrator that increases the risk for victimization, and descriptively our findings demonstrated that victims reported their partners had consumed substances prior to a small percentage of violence episodes. Clearly continued research is needed to understand the mechanisms behind the temporal relationship identified in the current study.

Our findings also demonstrated that the temporal associations between alcohol, marijuana, and dating violence victimization was moderated by relationship length. For the most part, alcohol and marijuana was associated with increased odds of victimization at low levels of relationship length, although this relationship was stronger for individuals in longer relationships. This suggests that, although substance use can increase the odds of victimization at any time during a relationship, the risk for victimization after substances have been consumed increases as the relationship progresses. However, the opposite pattern of findings emerged for heavy drinking and psychological aggression, such that women in shorter dating relationship were more likely to be victimized on heavy drinking days. It is likely that psychological aggression is most often the first form of aggression to emerge in dating relationships, thus making this type of aggression more likely to occur in shorter dating relationships. The finding that relationship length was negatively associated with violence across the study period is in contrast to previous research which has demonstrated relationship length to be positively associated with dating violence (Marcus & Swett, 2002; Shorey et al., 2012). However, as our findings demonstrated, this association was impacted by alcohol use, suggesting that there are important contextual factors that influence this association. Thus, continued research is needed that further explores the effect of relationship length on the association between substance use and dating violence.

Directions for Future Research

Findings from the current study help to advance our empirical and theoretical understanding of the relationship between alcohol, marijuana, and female dating violence victimization, although additional research is needed on this topic. An important direction for future research is to include both dyad members in the research design and to assess the substance use of both dyad members prior to violent episodes. Indeed, one explanation that has been proposed for why substance use by the victim may precede their victimization is that both partners are consuming alcohol and/or drugs together and, therefore, the substance use of the perpetrator increases the risk for violence (Foa, Cascardi, Zoellner, & Feeny, 2000). It is also possible that substance use by both partners synergistically interact to create a context for violence to occur, although notably a recent daily diary study with community couples failed to find support for this idea (Testa & Derrick, 2014). Still, this is an important area for future research to investigate, particularly among college student couples where alcohol and marijuana are consumed with regular frequency.

Future research that examines the temporal association between alcohol, marijuana, and dating violence victimization would be wise to include assessment of other contextual factors that may influence this relationship. For instance, college women consume alcohol more often on the weekend (Park, Armeli, & Tennen, 2004) and some research suggests that dating violence may be more likely to occur on the weekend (Shorey, Febres, Brasfield, & Stuart, 2011). Thus, it is possible that the increased odds of victimization is a result of these two behaviors naturally occurring more often on weekends. Future research can directly examine this question by including the day of the week in surveys and analyses. The presence or absence of other people may be an important moderating variable of the substance use – victimization association, such that the odds of victimization may be decreased when other people (e.g., friends) are present, as they may intervene to prevent violence when couple interactions turn negative (i.e., by separating partners). Indeed, the majority of violence between dating partners occur when they are alone (Shorey et al., 2011).

Clinical and Policy Implications

It should be clearly stated that the sole responsibility for stopping the perpetration of violence is always with the perpetrator and that the victim is never to blame for violence, regardless of whether substance use occurred prior to their victimization. With that being said, efforts at decreasing the rates of perpetration for dating violence have had minimal success (Cornelius & Resseguie, 2007; Shorey, Zucosky et al., 2012; Stuart, Temple, & Moore, 2007). Thus, efforts aimed at keeping women safe from violence victimization should also be directed toward women themselves (Gidycz & Dardis; 2014; Rychtarik & McGillicuddy, 2005; Wathen & MacMillian, 2003). That is, interventions designed to keep women safe and enhance risk reduction behaviors could be implemented.

For instance, helping women develop safety plans aimed at decreasing the chances for violence victimization could be developed, which may involve reducing substance use in order to increase their capability to escape potentially violent interactions with their partner. Given that data suggest an association between binge drinking and victimization (e.g.,

McCauley, Calhoun, & Gidycz, 2010), programs targeting high risk drinking on college campuses also might be expected to have an impact on rates of victimization. As suggested by Testa and Livingston (2009), focusing on reducing women's drinking may be a promising means of reducing sexual victimization. Women could also be educated that previous research suggests that substance use may impair women's ability to accurately perceive their risk for future violence from a partner (Cattaneo et al., 2007). Pending replication of these findings, it may be beneficial for researchers and clinicians to direct these programs at women who are in relatively stable, long-term dating relationships, as findings from the current study suggest these women are at enhanced risk for victimization on substance use days relative to women in shorter length relationships. Campus-wide programs that target the majority of women may be helpful in this regard. As the majority of our sample were Freshman and in relatively long dating relationships, targeting Freshman women may also prove beneficial in obtaining a sample of women in longer dating relationships. Although this study focused on women, concurrent programs that also address potential or actual perpetrators' drinking as well are needed. Indeed, there are some promising findings which suggest that targeting perpetrators' substance misuse leads to reductions in intimate partner violence (See Stuart, O'Farrell, & Temple, 2009 for a review).

Limitations

There are several limitations to the current study that should be addressed in future research. The nature of our sample, primarily non-Hispanic Caucasian college women, limits the generalizability of findings to other populations. Future research should attempt to recruit more ethnically diverse samples from both college and the community to enhance generalizability. We also did not obtain daily surveys from participants' dating partners. This is especially important as it is possible that partners were also consuming alcohol or marijuana prior to their violence perpetration. Therefore, it will be important for future research to collect daily surveys from both members of the relationship dyad in order to examine whether substance use by one or both partners contributes to an increase in the odds of dating violence victimization. Obtaining reports from both dyad members will also allow for the examination of corroborating reports of violence. Participants were asked to indicate whether they had consumed alcohol and/or marijuana "immediately" prior to victimization, and thus we are unaware how proximal substance use was to victimization (e.g., 10 minutes; 1 hour). Future research should improve upon this methodology. We also did not examine whether women were dating multiple partners simultaneously or consecutively, and future research should include this information. It was not possible for women to report different episodes of dating violence on the same day (e.g., violence that occurred in the afternoon and evening). Future research should allow for the examination of multiple dating violence episodes daily, as well as the temporal sequence of substance use and dating violence for each episode. We also do not have information on individuals who qualified for the study but chose to not participate, hindering our ability to determine if these individuals differed in any systematic way from the individuals who did participate. Our daily compliance rate, although low (61%), is consistent with previous research that has employed a 90-day diary study examining victimization among a community sample of women (Sullivan, McPartland, Armeli, Jaquier, & Tennen, 2012). Still, future research should attempt to increase the daily compliance rate.

Conclusion

In summary, findings from the current study demonstrated that the odds of dating violence victimization of college women (psychological, physical, and sexual) were increased on drinking days, heavy drinking days, and as the number of drinks increased by the victim. Additionally, marijuana use days by the victim increased the odds of sexual violence victimization. These findings were generally more pronounced for women who were in longer, relative to shorter, relationships. In combination with previous research demonstrating limited benefit of interventions aimed at decreasing dating violence perpetration, high rates of heavy or binge drinking on college campuses, findings suggest that interventions aimed at helping women keep themselves safe, possibly through reducing substance use, are sorely needed.

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Table 1
Temporal Associations between Alcohol Use, Marijuana Use, and Dating Violence Victimization.

Psychological Aggression				
	<i>t</i>	<i>B</i>	<i>SE</i>	<i>OR</i> CI
Alcohol Use (Yes/No)	3.57***	.24	.06	1.27 1.11, 1.45
Marijuana Use (Yes/No)	1.56	.21	.13	1.23 .95, 1.61
Alcohol Use (# of Drinks)	2.60*	.03	.01	1.03 1.01, 1.07
Marijuana Use (Yes/No)	2.45*	.31	.12	1.37 1.06, 1.76
Alcohol Use (Heavy Drinking)	3.79***	.38	.10	1.46 1.20, 1.79
Marijuana Use (Yes/No)	.85	.14	.17	1.15 .83, 1.62
Physical Aggression				
	<i>t</i>	<i>B</i>	<i>SE</i>	<i>OR</i> CI
Alcohol Use (Yes/No)	5.12***	.48	.09	1.61 1.34, 1.95
Alcohol Use (# of Drinks)	5.67***	.09	.02	1.10 1.06, 1.14
Alcohol Use (Heavy Drinking)	5.84***	.72	.12	2.05 1.61, 2.63
Sexual Aggression				
	<i>t</i>	<i>B</i>	<i>SE</i>	<i>OR</i> CI
Alcohol Use (Yes/No)	13.42***	.77	.05	2.17 1.94, 2.44
Marijuana Use (Yes/No)	7.68***	.91	.11	2.49 1.97, 3.15
Alcohol Use (# of Drinks)	8.97***	.10	.01	1.11 1.09, 1.14
Marijuana Use (Yes/No)	7.81	.96	.12	2.61 2.05, 3.33
Alcohol Use (Heavy Drinking)	3.03**	.26	.08	1.30 1.09, 1.54
Marijuana Use (Yes/No)	6.54***	.79	.12	2.21 1.74, 2.81

Note: SE = Standard error; OR = Odds ratio; CI = Confidence interval. Marijuana use was not included in physical aggression models due to models not converging.

* $p < .05$.

1000

 $p < .001$

10

 $p < .01$

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Interactions between Daily Alcohol Use, Daily Marijuana Use, and Relationship Length in Predicting Dating Violence Victimization.

Table 2

Psychological Aggression					
	<i>t</i>	<i>B</i>	<i>SE</i>	<i>OR</i>	<i>CI</i>
Alcohol (Yes/No)× Relationship Length	-.22	-.01	.07	.98	.85, 1.13
Marijuana (Yes/No) × Relationship Length	4.21***	.31	.07	1.36	1.17, 1.57
Alcohol (# Drinks)× Relationship Length	-1.06	-.01	.01	.98	.96, 1.01
Marijuana (Yes/No) × Relationship Length	3.86***	.26	.06	1.30	1.14, 1.49
Alcohol (Heavy Drinking)× Relationship Length	-2.21*	-.22	.09	.80	.66, .97
Marijuana (Yes/No) × Relationship Length	4.29***	.41	.09	1.51	1.25, 1.83
Physical Aggression					
	<i>t</i>	<i>B</i>	<i>SE</i>	<i>OR</i>	<i>CI</i>
Alcohol (Yes/No)× Relationship Length	.33	.02	.08	1.02	.87, 1.21
Alcohol (# Drinks)× Relationship Length	2.17*	.02	.01	1.02	1.00, 1.05
Alcohol (Heavy Drinking)× Relationship Length	5.53***	.61	.11	1.85	1.48, 2.31
Sexual Aggression					
	<i>t</i>	<i>B</i>	<i>SE</i>	<i>OR</i>	<i>CI</i>
Alcohol (Yes/No)× Relationship Length	2.41*	.14	.11	1.15	1.03, 1.29
Marijuana (Yes/No) × Relationship Length	.14	.01	.08	1.01	.84, 1.21
Alcohol (# Drinks)× Relationship Length	2.71**	.02	.01	1.02	1.00, 1.05
Marijuana (Yes/No) × Relationship Length	.61	.05	.09	1.02	.88, 1.26
Alcohol (Heavy Drinking)× Relationship Length	-.02	-.00	.10	.99	.82, 1.22
Marijuana (Yes/No) × Relationship Length	-.91	-.01	.10	.91	.73, 1.12

Note: SE = Standard error; OR = Odds ratio; CI = Confidence interval. Main effects of alcohol, marijuana use, and relationship length were included in the models but are not presented for clarity purposes. Marijuana use was not included in physical aggression models due to models not converging.

* $p < .05$,

1000

 $p < .001$

100

 $p < .01$

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