# Daily and situational reports of substance use and dating violence among college students: A 10-week prospective study

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## ARTICLE INFO

## ABSTRACT

*Introduction:* Although the association between substance use and dating violence is well-established in the research literature, there is limited research establishing the temporal co-occurrence of these variables. The primary objective was to examine the temporal relationship between alcohol and drug use and subsequent dating violence using a proximal effects model.

*Methods:* This prospective study obtained daily diary data and weekly situational reports on abusive relationship events and substance use from 72 college women in dating relationships over a 10-week interval.

*Results:* Significant day-to-day associations were found between substance use and dating violence for women's reports of their own behavior, and that of their male partners. The odds of dating violence were approximately 2.0 times higher on days when perpetrators drank alcohol. Women were approximately 2.0 times more likely to perpetrate dating violence when using drugs, and men were approximately 1.4 times more likely when they used drugs. Estimated blood alcohol concentration levels and binge drinking were associated significantly with dating violence perpetration for women's reports of men's behavior as well as for women's reports of their own aggression. These findings held when examining severe versus minor dating violence as well as any versus no dating violence.

*Conclusions:* These results further support an association between substance use and partner aggression at daily and situational levels of analysis, extending prior clinical findings to a college dating sample. Taken with previous research findings, our results suggest the need for college sexual assault and dating violence prevention programs to target reductions in substance use.

## 1. Introduction

Substance use among college students is a significant public health issue in the United States. In a recent study, 23% of full-time college students reported illicit drug use, 63% reported using alcohol, 43% reported being drunk at least once in the past month, and 35% reported binge drinking (i.e., five or more consecutive drinks) in the last 2 weeks (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2014). Consequences of college drinking include higher risk of accidental death, injury, unsafe sex, drunk driving, suicide attempts, and academic difficulties (NIAAA, 2013). College drinking is also associated with higher rates of perpetrating or experiencing sexual and physical assault (Zawacki et al., 2003).

Dating violence, defined as "the threat or actual use of physical, sexual, or verbal abuse by one member of an unmarried couple on the other member within the context of a dating relationship" (Anderson & Danis, 2007, p. 88), is also pervasive among U.S. college students. Approximately 20–30% of college students in intimate relationships report experiencing physical dating aggression, 70–90% report psychological aggression, and 3–20% report sexual coercion or aggression in the past year (Desmarais et al., 2012; Shorey, Cornelius, & Bell, 2008). Dating violence is associated with various health problems, including depression, anxiety, somatic complaints, and injuries (Shorey et al., 2008).

Research has supported the association between substance use and increased prevalence of dating violence; however, this relation is

complex (Katerndahl et al., 2020). In their meta-analysis, Crane, Godleski, Przybyla, Schlauch, and Testa (2016) found a significant, small effect ($d = 0.36$, $p < .001$) between acute drinking and subsequent aggression against women in a laboratory study using an aggression paradigm. In addition, these researchers found that the direct effect of alcohol increased both male perpetration of sexual aggression against women ($d = 32$, $p < .001$) and similarly, increased male perpetration of intimate partner violence[1] against women ($d = 0.45$, $p < .001$). Another meta-analysis by Crane, Licata, Schlauch, Testa, and Easton (2017) found a significant effect ($d = 0.17$, $p = .02$) of acute alcohol use on female perpetration of aggression against men in a laboratory study using an aggression paradigm. In comparing male- versus female-perpetrated intimate partner violence in these meta-analyses, the effect of alcohol on female aggression is approximately half the size of the effect of alcohol on male aggression. Meta-analyses have also revealed a significant association between drug use and dating violence among college students (Moore et al., 2008). Although less is known about specific drugs of misuse, meta-analytic findings indicate that cocaine misuse has a relatively strong association with intimate partner violence among college students, and marijuana use is also associated with increased partner aggression (Moore et al., 2008).

Various theoretical models have been proposed to explain this association, including the proximal effects model (Parrott & Eckhardt, 2018; Shorey, Stuart, & Cornelius, 2011), which postulates an immediate causal influence of substances on aggression as a function of intoxication (Chermack & Taylor, 1995) and various other individual and context-based elements (Parrott & Eckhardt, 2018). Experimental designs that allow for studying proximal effects models are preferred to cross-sectional and other designs whose limitations make it necessary to focus on distal factors (Crane et al., 2016). Proximal effects models consider direct pharmacological effects through which alcohol reduces the effectiveness of social information processing and decision-making thereby impeding the individual's capacity to refrain from acting aggressively (Giancola et al., 2010).

Although many studies have documented a significant association between substance use and dating violence, the vast majority have asked participants to report on aggression and substance use, retrospectively, over extended periods (e.g., 6–12 months). Such retrospective reports appear to underestimate both alcohol use (e.g., Krenek, Lyons, & Simpson, 2016; Patrick & Lee, 2010) and dating violence (e.g., Moore, Elkins, McNulty, Kivisto, & Handsel, 2011; Neal & Edwards, 2019; Waterman, Edwards, Dardis, Kelley, & Sessarego, 2019). In contrast, the extent to which dating violence and substance use co-occur temporally has received relatively little attention. To test the proximal effects model, it is critical to examine these associations at the daily level, controlling for individual differences by observing individual behavior over time.

Our literature review identified several studies to date that prospectively examined the daily co-occurrence of substance use and dating violence in the college population using daily diaries. Shorey, Stuart, Moore et al. (2014) collected data on substance use and dating violence using daily on-line surveys for 90 days. They found that alcohol use was associated with greater odds of college women perpetrating physical and psychological aggression. Heavy alcohol use (i.e., four or more standard drinks in one day) was significantly associated with perpetrating physical, sexual, and psychological dating violence. Shorey, Stuart, Moore et al. (2014) also found that marijuana use days were associated with perpetrating psychological aggression. In a college male sample, these researchers (using the same methodology) found that the odds of physical and sexual aggression perpetration increased on any alcohol use days, heavy alcohol use days (i.e., five or more standard drinks), and

when alcoholic drink totals were higher on a given day (Shorey, Stuart, McNulty et al., 2014). These findings suggest that greater alcohol use, and greater intoxication, may increase the likelihood of dating violence. Although these studies provide strong initial support for the proximal effects model, more research is needed to replicate and extend these results with other college populations and different data collection methods.

In a study comparing the feasibility of different experience sampling methods, Waterman et al. (2019) compared a weekly daily diary assessment with a retrospective assessment of intimate partner violence. They found that participants reported a greater amount of intimate partner violence using daily diaries than retrospective reports. These researchers concluded that daily diary violence research appears to be more accurate than longer, retrospective reports (Waterman et al., 2019). However, their data collection was limited to 3 weeks, and they did not consider the associations with substances other than alcohol. In addition, this study suffered from significant attrition with only about 50% of participants completing the study, and approximately 25% completing each of the 21 days.

In addition to examining day-to-day risk for partner violence, it is critical to explore specific conflict event details. Among men seeking alcohol treatment, individuals reported consuming more standard drinks in the 12 hours prior to physically assaultive versus nonviolent spousal conflicts (Murphy, Winters, O'Farrell, Fals-Stewart, & Murphy, 2005). Similarly, Shook, Gerrity, Jurich, and Segrist (2000) found that consuming alcohol within 3 hours of a dating conflict was associated with male and female verbal aggression and with female physical aggression perpetration. Although such findings provide additional specificity in linking alcohol consumption to conflictual and aggressive incidents, more research is needed to examine these associations in the context of dating relationships.

The goal of the present study was to explore the extent to which dating violence co-occurs with psychoactive substance use in dating relationships. Unlike some past daily diary studies which have limited themselves to physical dating violence (e.g., Epstein-Ngo et al., 2013), the present study also included psychological aggression and sexual coercion. Unmarried women were asked to complete weekly questionnaires for 10 weeks. The exclusive recruitment of women, which is consistent with some prior research on proximal associations between substance use and dating violence (e.g., Shorey, Moore, McNulty, & Stuart, 2016; Sullivan, Khondkaryan, Dos Santos, & Peters, 2011), is supported by prior evidence of sampling biases in male college students' participation in dating violence research (Moore et al., 2011). Moreover, there is evidence that women's reports of their own experience and perpetration of violence may be more reliable and valid than men's reports of their dating violence against women (Derrick, Testa, & Leonard, 2014). The study was designed to obtain both daily and situational reports of relationship conflicts while minimizing possible memory distortions and response biases in retrospective reports over longer intervals. We tested two hypotheses: (1) that the risk of dating violence would be higher on days when perpetrators consumed alcohol and/or drugs than on days when they did not use substances and (2) that the degree of alcohol intoxication, measured by estimated blood alcohol concentration (BAC) levels during a conflict incident, would be positively correlated with dating violence perpetration in terms of severity of dating violence as well as in terms of presence of any dating violence.

## 2. Materials and methods

### 2.1. Ethics

This study was approved by Institutional Review at the University of Maryland, Baltimore County (UMBC). All participants were fully informed about the study, including the risks and benefits and that they were allowed to withdraw at any time. Participant reports were protected by a Federal Certificate of Confidentiality.

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[1] Consistent with general usage in the literature, the term dating violence refers to unmarried, college student samples and intimate partner violence refers to samples of cohabitating or married couples and clinical studies.

## 2.2. Participants and procedure

Participants were 90 women attending UMBC during the 2000–2001 academic year. Demographics for the final sample are presented in Table 1.

Inclusion criteria were: (a) being unmarried and non-cohabiting; (b) both partners being at least 18 years old; (c) dating the same person in a heterosexual relationship for at least the past 10 weeks; (d) at least weekly face-to-face contact with one's dating partner; (e) consumption of at least one alcoholic beverage during the past 2 weeks by either partner; and (f) experience or perpetration of an abusive event (psychological, physical, or sexual) in the current dating relationship during the past 10–12 weeks. Exclusion criteria were: (a) no contact information; and (b) either partner in couples therapy, anger management treatment, or substance use treatment within the past 30 days. Recent alcohol use and dating violence at baseline were required for study inclusion to maximize the likelihood that participants would indicate alcohol consumption and dating violence during the 10-week observation interval, providing sufficient data to estimate their co-occurrence. The follow-up interval was selected to minimize attrition by limiting participation to within one university semester.

Of the 389 individuals screened, 102 met the eligibility requirements, 2 individuals declined participation, 4 could not be scheduled, 96 agreed to attend a baseline session (90 completed it), and 72 (the final sample for all analyses) completed at least 9 of the 10 weekly questionnaires (80% compliance rate).

We recruited participants from introductory-level psychology classes and campus events. Interested, eligible individuals received study information, were informed of incentives, which included extra credit for some psychology courses and a prize lottery (DVD-player, microwave, etc.), and were scheduled for a baseline assessment.

Upon entering the laboratory, participants gave verbal and written informed consent and completed a baseline assessment consisting of self-report and interview measures administered by the first author or a trained research assistant. Administration order for the paper-and-pencil measures was randomized. At interview's end, participants learned how to complete the daily assessments on the weekly questionnaire.

Participants selected their preferred method for returning the weekly

**Table 1**
Sociodemographic characteristics of the final sample that completed at least 90% of the weekly questionnaires (*n* = 72).

| Variable | | Descriptive statistics and frequencies | |
|---|---|---|---|
| Age of female participants | | *M (SD)* | 20.21 years (2.25 years) |
| | | *Mdn (Range)* | 20.00 years (18–31 years) |
| Class status | Freshman | | 15.3% |
| | Sophomore | | 31.9% |
| | Junior | | 33.3% |
| | Senior | | 18.1% |
| | Graduate Student | | 1.4% |
| Ethnicity | African American/ Black | | 15.3% |
| | Asian American/ Asian/Pacific Islander | | 8.3% |
| | Biracial/Multicultural/ Other | | 8.4% |
| | Caucasian/Non-Hispanic/White | | 68.1% |
| Marital history | Never married (divorced) | | 98.6% (1.4%) |
| Relationship length (current relationship) | | *M (SD)* | 18.74 months (16.36 months) |
| | | *Mdn (Range)* | 16.00 months (3–96 months) |

questionnaire. During the subsequent 10-week interval, individuals failing to submit their weekly questionnaires on time were contacted and encouraged to submit the weekly questionnaire the following day. Steps to minimize participant attrition and to maximize timely questionnaire submission included modifications (e.g., alternative drop-off days), three small incentives (e.g., gift cards) at variable intervals, and entry into a prize lottery for those who completed at least 9 of the 10 weekly questionnaires. Twenty-percent of lottery participants won a prize.

The 10-week follow-up assessment included measures paralleling the baseline session. In addition, participants specified days during the 70-day study on which they had no partner contact, including face-to-face, phone, or e-mail contact, and any intervals during which they had broken up. Participants were also asked about any treatment they or their partners received during the study. Finally, participants were debriefed, thanked for participating, given lottery prizes (if applicable), and provided with local dating violence and substance misuse resources.

## 2.3. Measures

### 2.3.1. Screening questionnaire

The packet focused on demographics, contact information, alcohol use, and dating violence for inclusion screening.

### 2.3.2. Participant demographics

A demographics questionnaire was given at the initial session. This questionnaire assessed the participant's age, ethnicity, marital status, height and weight (to assist in computing BAC levels), grade-point average, class status, and relationship information.

### 2.3.3. Daily assessment of substance use

Daily reports of alcohol use (in standard drinks) and illicit drug use (yes/no) were collected on a weekly questionnaire. A standard drink was operationally defined as a "drink that contains about 14 g of pure alcohol" (NIAAA, 2010; p. 1). Examples include 12 oz. of beer, 8–9 oz. of malt liquor, 5 oz. of wine, and 1.5 oz. of 80-proof spirits. Participants separately rated both their own substance use and that of their male partners. Past daily diary studies have similarly relied on female participants' reports of their male partners' alcohol and cannabis use (i.e., Shorey et al., 2016). Prior investigations, including studies of college students, have found that collateral informants produce data across a range of alcohol variables, including quantity and frequency of consumption, binge drinking, and negative consequences, that are strongly correlated with the target's self-report data (Hagman et al., 2010; Laforge, Borsari, & Baer, 2005). In addition, collateral reports from intimate relationship partners tend to be more highly correlated with the target's self-reported alcohol use than collateral reports from non-intimates (Sobell, Agrawal, & Sobell, 1997).

### 2.3.4. Daily reports of dating violence

Daily reports of dating violence were assessed using a subset of items from the Revised Conflict Tactics Scales (CTS2; Straus, 1979; Straus, Hamby, Boney-Mccoy, & Sugarman, 1996). The CTS2, a widely-used measure of relationship aggression, was normed on a sample of heterosexual college students (*N* = 317) in dating, cohabiting, or marital relationships. Convergent and discriminant validity were supported through observed correlations between conceptually-similar and theoretically-distinct subscales (Straus et al., 1996).

In order to minimize subject response burden while assessing frequently-endorsed forms of dating violence, as in other daily assessment studies (e.g., Derrick et al., 2014; Waterman et al., 2019), the daily reports used a reduced item set. The Injury subscale was removed. All 8 Psychological Aggression items, all 6 Negotiation items, 9 of 12 Physical Assault items, and 3 of 7 Sexual Coercion items were retained. Dating violence was defined as any report of psychological, physical, or sexual aggression on this reduced item set.

Internal consistency estimates in the current sample for self-report of perpetration using the modified CTS2 subscales at baseline were similar to those reported for the unabridged CTS2 for self-report of perpetration in the development sample (Straus, 1990, Straus et al., 1996): modified Physical Assault (Cronbach's $\alpha = 0.77$, originally $\alpha = 0.86$), modified Sexual Coercion ($\alpha = 0.79$; originally $\alpha = 0.87$), full Psychological Aggression (Cronbach's $\alpha = 0.65$, originally $\alpha = 0.79$), and full Negotiation ($\alpha = 0.82$; originally $\alpha = 0.86$). Psychometrics were not obtained for the Physical Injury subscale as it was not included on the daily assessments.

### 2.3.5. Severity of dating violence

Severity was defined as either "minor" or "severe" based on CTS2 item categorization. Non-aggression events (i.e., negotiation and pleasurable activities) included the 6-item CTS2 Negotiation subscale, 1 item created for this study ("initiated a pleasurable sexual experience with the other person"), and 4 items from the Dyadic Adjustment Scale (Spanier, 1976). These non-aggressive relationship event items were only included for content balance and to retain interest for participants with low levels of conflict. Dichotomous response scoring (0 [*item not endorsed*] and 1 [*item endorsed*]) was used for the modified CTS2 for each day of the week. Total aggression for each day was calculated as the sum of the aggression items.

### 2.3.6. Weekly situation analysis

Prior to submitting the weekly questionnaire, participants were asked to review the daily reports, select the "weekly situation," and complete questions about this event. The weekly situation was the incident during the week in which participants' or their partners' behavior had the highest aggression severity value using a pre-determined ordering of items (Murphy et al., 2005). If two or more incidents were equal in aggression severity, participants were asked to report on the most recent situation. During weeks in which they reported no dating violence, participants reported on a negotiation experience or pleasurable activity. The situational assessment items examined the frequency and timing of abusive behaviors, the frequency and timing of substance use, the number of standard drinks consumed during the 12 hours prior to the conflict event (to estimate BAC levels), who initiated the conflict, and how it began. The women's perception of which partner started the dating violence conflict was a proxy for determining whether the primary aggressor was herself, her male partner, or both partners (i.e., bidirectional dating violence). Participants also selected from a list of 26 common conflict topics (e.g., alcohol, drugs, leisure time, money, personal habits, and sex; Murphy et al., 2005).

### 2.3.7. Alcohol intoxication

For the weekly situational event targeted for more detailed assessment, the extent of alcohol intoxication for both the participant and male partner was measured in two ways. First, estimated BAC levels were calculated using the BACCuS 2.01 computer program (Markham, Miller, & Arciniega, 1993). This program considers one's biological sex, weight, number of standard drinks, and time since first drink in obtaining estimated BAC measurements. Estimated BAC levels were derived based on the drinking reported in the 12 hours prior to the weekly situation. Second, binge drinking, defined as consuming at least four drinks (five for men) on a single occasion (Kanny et al., 2018) prior to the weekly situation, was analyzed dichotomously.

### 2.4. Data analysis

Separate analyses examined participants' reports of their own and their partners' aggressive relationship behaviors and substance use. All effects were tested at the 0.05 level of significance. Univariate statistical analyses were conducted for demographic variables, dating violence perpetration and victimization, and substance use.

To test the first hypothesis, we utilized binary logistic regression to examine the associations between dating violence events on substance use days versus non-substance use days during the 10-week interval of the study. Autocorrelation was controlled in an effort to guard against an inflated association between substance use and aggression variables due to one's previous history of violence. To accomplish this, dating violence was lagged 1 day, in effect serving as a covariate to control for the presence of dating violence on the prior day.

To test the second hypothesis, we used pooled within-subjects correlation matrices to investigate the relation between the extent of alcohol intoxication (i.e., BAC levels and binge drinking) prior to a dating aggressive event and the severity of dating violence. These estimates reflect covariation of alcohol consumption and dating violence at the individual level and are not affected by mean differences across participants in average levels of drinking or aggression. These correlations were calculated in two ways: (a) examining severe versus minor aggression as defined by the CTS2 and (b) any aggression versus no aggression.

## 3. Results

### 3.1. Missing data

Data were missing for three reasons: (a) skipped items; (b) not submitting weekly questionnaires; and (c) attrition from the study. Within-subjects mean item replacement was used for missing weekly questionnaire items, except for reports of Physical Assault or Sexual Coercion. For those two subscales, the total of completed items was used due to the tendency to skip the more severe items (with very low base rates). The analyses included only those reports which had at least two-thirds of the items necessary for the computation of each subscale, producing minor fluctuation in sample sizes across analyses.

### 3.2. Attrition

*T*-tests for independent samples identified no significant differences between the participants who completed the follow-up assessment (or at least nine weekly questionnaires) and those who did not, in terms of age, ethnicity, marital history, college year, parents' levels of education, relationship length, relationship commitment, alcohol use, substance use, dating violence perpetration (psychological, physical, or injury), or relationship satisfaction (all *ps* > 0.05). There was a trend for women who completed both the baseline and follow-up assessment ($M = 20.14$, $SD = 2.19$) to be younger than women who only completed the baseline assessment ($M = 21.90$, $SD = 5.13$), $t(88) = 1.76$, $p = .05$. In addition, at the baseline assessment, only one participant reported perpetrating severe sexual coercion. This individual happened to be in the attrition group, producing a significant difference on this variable between conditions for those who completed follow-up ($M = 0.00$, $SD = 0.00$) versus those who completed only baseline ($M = 0.30$, $SD = 0.95$), $t(88) = 2.95$, $p = .004$).

### 3.3. Preliminary analyses

#### 3.3.1. Days without partner contact

Participants reported relatively few days during the 70-day study interval on which they had absolutely no contact with their dating partner ($M = 3.54$, $SD = 6.58$, $Mdn = 1.50$, $Range = 0–35$ days). Therefore, this variable was not included as a covariate in subsequent analyses.

#### 3.3.2. Relationship stability

Of the 80 women who completed the follow-up assessment, four (5%) reported breaking up with their partners once during the study, and one (1%) reported breaking up with her partner twice during the study. At follow-up, 78 participants (98%) indicated that they were still dating their original relationship partner. Overall, four participants

**Table 2**
Frequency data for substance use and dating violence based on women's reports for themselves and their male partners.

| Variable | Percentage of days endorsed for women (by self-report) | Percentage of days endorsed for men (by women's report) |
|---|---|---|
| | ($n$ = 4961 days) | ($n$ = 4916 days) |
| Perpetration of any dating violence[a] | 9.8% | 9.5% |
| Any alcohol consumption | 15.5% | 23.9% |
| | ($n$ = 4976 days) | ($n$ = 4973 days) |
| Any drug consumption | 5.3% | 9.9% |
| | ($n$ = 767 days) | ($n$ = 1176 days) |
| Dating violence perpetration on drinking days | 12.8% | 12.1% |
| | ($n$ = 263 days) | ($n$ = 493 days) |
| Dating violence perpetration on drug days | 23.6% | 21.9% |
| | ($n$ = 4194 days) | ($n$ = 3740 days) |
| Dating violence perpetration on non-drinking days | 9.2% | 8.7% |
| | ($n$ = 4713 days) | ($n$ = 4480 days) |
| Dating violence perpetration on non-drug days | 9.0% | 8.1% |

[a] Dating violence was measured using a modified version of the Revised Conflict Tactics Scales (CTS2).

(5%) cited breaking up as the main reason for failing to complete the weekly questionnaires. Although cohabitation during initial screening was an exclusion criterion for the study, at the time of follow-up, three women (4%) reported that they were cohabiting.

### 3.3.3. Involvement in treatment at the follow-up assessment

At the follow-up assessment, 11 participants (14%) reported being in individual counseling, and three participants (4%) reported other counseling types. By women's report, two male dating partners (3%) were seeing an individual counselor at study's end.

### 3.4. Tests of primary hypotheses

#### 3.4.1. Odds of dating violence on substance use days

The first hypothesis, that there would be a greater likelihood of dating violence events on drinking/drug days than on non-drinking/drug days during the 10-week interval of the study, was tested using binary logistic regression. Autodependence (operationalized as the presence or absence of dating violence on the previous day) was

**Table 3**
Frequency data for specific drug use during the 70-day study as reported by women for themselves and their male partners ($n$ = 72).

| Specific drug | Percentage of women (by self-report) endorsing specific drug use | Percentage of men (by women's report) specific drug use |
|---|---|---|
| Cannabis | 26.4% | 27.8% |
| Sedatives | 8.3% | 5.6% |
| Amphetamines/ Methamphetamines | 6.9% | 5.6% |
| Cocaine | 2.8% | 2.8% |
| Hallucinogens | 2.8% | 1.4% |
| Opioids | 2.8% | 1.4% |
| Other (Ecstasy, MDMA, etc.) | 9.7% | 12.5% |
| No drug use | 65.3% | 68.1% |

controlled in these analyses. Frequency data are presented Tables 2 and 3.

Considering the association between dating violence perpetrated and alcohol consumed, significant effects were identified for women's behavior and for reported male behavior (Table 4). Turning to the association between dating violence perpetrated and drug use, a significant effect was found for women's behavior (Table 4) but not for reported male behavior.

Using relative risk statistics, the odds of dating violence were approximately 2.0 times higher for both women's behavior and reported male behavior reported male on drinking days than on non-drinking days (Table 4). The odds of dating violence were 2.0 times higher (for female participants' self-reports) and 1.4 times higher (for women's reports of their male partners' behavior) on drug use days than on non-drug use days. Overall, the odds of dating violence were significantly higher ($p$ < .05) on substance use days than non-substance use days, with the exception of the odds for women's reports of their male partners' drug use ($p$ = .08).

### 3.4.2. Severity of dating violence and extent of intoxication in weekly situation reports

For follow-up questions about a specific weekly situation, participants provided data on dating violence events 42% of the time, with severe dating violence reported during 3.6% of these weekly situations. In the remaining 58% of weekly situations, individuals reported on negotiation (or pleasurable) events, as no dating violence by either party was reported that week. To test the second hypothesis, the severity of violent behavior in the weekly situation was correlated with the extent of alcohol intoxication measured in two ways: as estimated BAC levels and the presence/absence of binge drinking. Descriptive statistics and frequency data are presented (Table 5).

Pooled within-subjects correlation matrices were computed separately for women's drinking behavior and reported male drinking behavior (by female report) when considering the worst conflict situation for the week (Table 6). The second hypothesis was supported for both women and men. When considering the conflicts that resulted in dating violence, significant associations were found between the severity of dating violence perpetration (severe versus mild aggression) and both estimated BAC levels ($r$ = 0.29 for women and men) and whether they had engaged in binge drinking ($r$ = 0.28 and 0.24, respectively). When the worst conflicts from the weekly situation were considered in terms of whether there was any dating violence, the same pattern emerged. For the relation with estimated BAC levels, the

**Table 4**
Binary logistic regression analyses for substance use and dating violence for women's reports for themselves and their male partners.

| Behavioral comparison | $B$ | $SE$ | $z$ | $p$ | Odds Ratio |
|---|---|---|---|---|---|
| *Aggression by female participants ($n$ = 4873 [alcohol] and 4868 [drugs] daily reports)* | | | | | |
| Alcohol use | −0.68 | 0.16 | 4.35 | <0.001 | 1.96 |
| Past day dating violence[a] (ALC) | −0.56 | 0.15 | 3.65 | <0.001 | 1.75 |
| Constant (ALC) | −1.31 | 0.51 | 2.59 | 0.010 | 3.72 |
| Drug use | −0.67 | 0.29 | 2.30 | 0.021 | 1.95 |
| Past day dating violence (DRU) | −0.53 | 0.15 | 3.40 | 0.001 | 1.69 |
| Constant (DRU) | −1.25 | 0.56 | 2.24 | 0.025 | 3.51 |
| *Female report of male partners' aggression ($n$ = 4835 [alcohol]and 4890 [drugs] daily reports)* | | | | | |
| Alcohol use | −0.71 | 0.14 | 4.94 | <0.001 | 2.03 |
| Past day dating violence (ALC) | −0.48 | 0.16 | 3.09 | 0.002 | 1.62 |
| Constant (ALC) | −3.16 | 1.03 | 3.08 | 0.002 | 23.81 |
| Drug use | −0.35 | 0.20 | 1.74 | 0.082 | 1.42 |
| Past day dating violence (DRU) | −0.44 | 0.16 | 2.84 | 0.005 | 1.56 |
| Constant (DRU) | −3.31 | 1.04 | 3.19 | 0.001 | 27.03 |

*Note.* Statistical tests for the 72 subjects' effects are omitted. ALC = alcohol. DRU = drug.

[a] Dating violence was measured using a modified version of the Revised Conflict Tactics Scales (CTS2).

**Table 5**

Descriptive statistics and frequency data for extent of intoxication, alcohol use data, and dating violence for women's reports for themselves and their male partners.

| Variable | | Behavior of female participants | Female report of behavior of male partners |
|---|---|---|---|
| No CTS2 aggression | | $n = 345$ situations | $n = 360$ situations |
| | Estimated BAC level (M, [SD]) | 0.004 (0.018) | 0.007 (0.026) |
| | Estimated BAC level (Range) | 0.000–0.155 | 0.000–0.194 |
| | Binge drinking (%) | 2.3% | 5.3% |
| Minor CTS2 aggression | | $n = 185$ situations | $n = 171$ situations |
| | Estimated BAC level (M, [SD]) | 0.007 (0.030) | 0.014 (0.040) |
| | Estimated BAC level (Range) | 0.000–0.284 | 0.000–0.236 |
| | Binge drinking (%) | 4.3% | 11.7% |
| Severe CTS2 aggression | | $n = 12$ situations | $n = 21$ situations |
| | Estimated BAC level (M, [SD]) | 0.023 (0.046) | 0.035 (0.058) |
| | Estimated BAC level (Range) | 0.000–0.136 | 0.000–0.179 |
| | Binge drinking (%) | 8.3% | 28.6% |

*Note.* Binge drinking was defined as four or more drinks for women (five or more drinks for men) on a single occasion (Kanny et al., 2018). BAC = blood alcohol concentration. CTS2 = modified version of the Revised Conflict Tactics Scales.

**Table 6**

Pooled within-subjects correlation matrices for estimated blood alcohol concentration (eBAC) levels, binge drinking, and dating violence for weekly conflict situations (both non-violent and violent) based on women's reports for themselves and their male partners.

| Weekly situation | Female participants' drinking | | Male partners' drinking[c] | |
|---|---|---|---|---|
| | eBAC[a] | Binge[b] | eBAC | Binge |
| **Female-initiated violent conflicts ($n = 107$ situations)[1]** | | | | |
| Binge drinking[b] | 0.88*** | | | |
| Severe aggression[b] | 0.29** | 0.28** | | |
| **Male-initiated violent conflicts ($n = 102$ situations)[1]** | | | | |
| Binge drinking | | | 0.73*** | |
| Severe aggression | | | 0.29** | 0.24** |
| **Bidirectional violent conflicts ($n = 90$ situations)[1]** | | | ($n = 90$ situations) | |
| Binge drinking | 0.77*** | | 0.80*** | |
| Severe aggression | 0.00 | 0.00 | −0.07 | 0.00 |
| **Female-initiated conflicts ($n = 157$ situations)[1,2]** | | | | |
| Binge drinking | 0.88** | | | |
| Any aggression | 0.11* | 0.11* | | |
| **Male-initiated conflicts ($n = 167$ situations)[1,2]** | | | | |
| Binge drinking | | | 0.76*** | |
| Any aggression | | | 0.28** | 0.19** |
| **Bidirectional conflicts ($n = 385$ situations)[1,2]** | | | ($n = 385$ situations) | |
| Binge drinking | 0.70*** | | 0.78*** | |
| Any aggression | −0.01 | 0.02 | −0.02 | −0.01 |

*Note.* Binge drinking was defined as four or more drinks for women (five or more drinks for men) on a single occasion (Kanny et al., 2018). eBAC = estimated blood alcohol concentration level.

[a] Continuous variable.
[b] Dichotomous variable (0 = absent; 1 = present).
[c] By women's report.
[1] Female participants indicated whether the conflict event (as measured by a modified version of the Revised Conflict Tactics Scales [CTS2]) was initiated by themselves, their male partners, or both partners.
[2] These situations included non-violent conflicts as well as conflicts involving dating violence.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

correlations were 0.11 and 0.28 for females and males, respectively, and for binge drinking, they were 0.11 and 0.19.

Exploratory analyses were conducted on bidirectional conflict events, defined as both partners initiating the worst conflict. Bidirectional conflict events wereexplored in greater detail in the weekly situational analysis. The weekly situations included both violent and non-violent conflicts. No associations were found between dating violence (severe/minor dating violence or presence/absence of dating violence) and either estimated BAC levels or binge drinking.

## 4. Discussion

The primary hypothesis regarding co-occurrence of dating violence events and substance use received consistent support at the daily level. A consistent daily association was found even after controlling for individual differences in dating violence perpetrated on the previous day. The odds of any dating violence (psychological, physical, or sexual) were roughly 2.0 times higher on a drinking day than on a non-drinking day and about 1.4 times (women's reports for men) to 2.0 times (women's self-reports) on a drug use day. The only non-significant odds ratio was for women's reports of their male partners' dating violence on drug use days.

In general, the results are consistent with, and extend, two previous studies examining daily associations between alcohol consumption and dating violence in college samples. Using electronic daily diaries, Moore et al. (2011) found that the odds of perpetrating dating violence on drinking versus non-drinking days were 2.2 times higher (psychological aggression) and 3.6 times higher (physical assault). Unlike the current investigation, their study was limited to alcohol and did not include sexual coercion. Similarly, using an interactive, computer-guided phone data collection method with female college students who experienced dating violence, Parks, Hsieh, Bradizza, and Romosz (2008) found that on heavy drinking versus non-drinking days, the odds were 2.2 times

higher (verbal aggression), 11.8 times higher (physical assault), and 19.4 times higher (sexual coercion). Their investigation focused solely on alcohol (i.e., binge drinking) and examined dating violence victimization (not perpetration). Thus, despite differences in methods, samples, sites, and measurement of substance use and dating violence, these studies provide strong and consistent support for the conclusion that substance use and dating violence are associated on a daily basis well beyond chance levels.

By including more detailed analysis of weekly situations, the present study also contributes new findings with respect to associations between dating violence and the extent of alcohol intoxication, measured as estimated BAC levels and the presence or absence of binge drinking prior to a conflict event. The second prediction was that greater alcohol consumption would be associated with more severe dating violence behaviors as well as with presence of any dating violence. This prediction received support for women's self-reports as well as their reports of their male partners' behavior. Specifically, prior to the weekly situations examined, the mean estimated BAC levels and binge drinking reported for all individuals were consistently lowest for events in which individuals were nonviolent, intermediate when individuals engaged in minor violence, and highest when individuals perpetrated severe violence.

These findings are consistent with a study demonstrating that

estimated BAC levels were higher prior to physically violent conflicts relative to nonviolent conflicts in a clinical sample of men with severe alcohol problems (Murphy et al., 2005). These findings were replicated in a more recent study, where estimated BAC levels were significantly higher during violent conflicts than non-violent conflicts among women entering substance use treatment (Kaufmann, O'Farrell, Murphy, Murphy, & Muchowski, 2014). In a similar vein, Moore et al. (2011) reported that for every additional alcoholic drink, the odds ratios for psychological aggression and physical assault increased by 1.2 and 1.1 times, respectively. Roudsari, Leahy, and Walters (2009) found that 1-month estimated peak BAC levels were associated with greater dating violence (i.e., verbal and emotional aggression) for college students. This finding was true for victimization and perpetration reports. Dating violence perpetrators also had higher threatening abuse scores. Stappenbeck and colleagues also found that higher daily BAC levels were significantly associated with a higher probability of dating violence perpetration (Stappenbeck et al., 2016). Yet, those with low-average BAC levels (i.e., typically light drinkers) were more likely to perpetrate dating violence on days of heavy drinking than those at the high-average BAC level (i.e., typically heavy drinkers).

In contrast, when bidirectional conflicts were considered in exploratory analyses, there was no association between type of dating violence and amount of alcohol consumed for either female participants or their reports for their male partners. This null finding is surprising , as it suggests when both partners instigate a conflict that results in dating violence, the role of level of alcohol intoxication may be negligible. However, the aforementioned reliable association between these substance use and dating violence variables, when only one person in the couple is the primary initiator of the conflict, remains salient.

The finding of an association between drug use and dating violence remains intriguing given that cannabis, as evidenced in the present study, tends to be the most widely-used illicit drug by college students with its use being over 6 times as frequent as the next most widely-used drug (i.e., amphetamines; CORE Survey, 2013). Although cannabis has often been thought to decrease the risk of violence (Stephens, 1999), some scholars have argued that the current research linking cannabis use to dating violence is inconclusive (Shorey et al., 2017). However, another daily diary study found that cannabis use was associated with subsequent psychological (but not physical) dating violence in college women, after controlling for alcohol use (Shorey, Stuart, Moore et al., 2014). Also, meta-analysis has revealed a significant positive association between marijuana use and intimate partner violence (Moore et al., 2008), with small-to-medium average effects. However, most of the reviewed research examined drug use and aggression over long periods of time, rather than specific associations at the daily or situational level (Testa & Brown, 2015). Some investigators have suggested that marijuana may be associated with partner aggression due to its association with general patterns of deviant and antisocial behavior (Murphy, O'Farrell, Fals-Stewart, & Feehan, 2001), or due to withdrawal effects such as increased agitation or depression (Moore & Stuart, 2005). However, the current study's methods help to control for individual differences by examining variations over time within individuals. The confounding influence of withdrawal effects also were relatively well-controlled by examining dating violence that occurs on the same day as substance use.

It is important to note that many dating violent events identified in the current study occurred in the absence of alcohol or drug use. Although substance use is associated with an increased risk of becoming aggressive, it is not a necessary or sufficient condition for explaining dating violence (Crane et al., 2016).

The present investigation has several strengths. First, it elucidated the connections between substance use and dating violence in a non-treatment-seeking sample of young adults. Possible memory confounds were reduced with this study's prospective, 10-week design. The present study replicated and extended past research using a relatively long

assessment period (i.e., 70 days) versus 14 days (Sheehan & Lau-Barraco, 2018), 21 days (Waterman et al., 2019), 56 days (Derrick et al., 2014), or 60 days (Moore et al., 2011) allowing for more opportunity to examine how substance use and dating violence are associated over a longer assessment with a relatively low rate of attrition (i.e., 80% compliance rate). Given that participants effectively served as their own controls across time, the design helped to rule out explanations for the association between substance use and dating violence that are based on third variable explanations such as personality characteristics that increase the probability for both of these problematic behaviors. The sample selection assisted in avoiding a common confound in treatment samples: that the associations between substance use and aggression may vary over time as a function of behavior changes during treatment. In addition, the present investigation was one of the few studies to explore the association between alcohol consumption and dating violence severity level (e.g., Shorey, Brasfield, Zapor, Febres, & Stuart, 2015). Finally, the investigation obtained data to consider alcohol use by estimating BAC levels, allowing for a more fine-grained, situational analysis of alcohol use and dating violence.

This investigation has several limitations. First, given the relatively low base rates of dating violence, longer time intervals than 10 weeks and/or larger samples may be needed to capture adequately the associations between substance use and more severe forms of physical and sexual violence. Despite the rationale for including only women in the present study, it would be useful to have self-reports from men as well as couple reports. Having male participants could minimize potential inaccuracies of female reports and could supplement them with respect to possible unobserved substance use (e.g., Derrick & Testa, 2017; Testa & Derrick, 2014). Second, the relatively low frequency of drug use provides a less reliable estimate of association with dating violence as compared to alcohol use. In addition, as particular kinds of drug use (e. g., amphetamines and cocaine) appear more apt to be associated with violence but are relatively infrequent in non-clinical samples, it may be important in future research to use much larger samples or to over-sample populations that use these substances in order to examine associations with specific classes of drugs, a common challenge in past dating violence studies (e.g., Erickson, Gittelman, & Dowd, 2010; Moore et al., 2011). As cannabis was the most commonly-used drug in the present study and in similar studies of college students, our results may not generalize to other specific drugs. Moreover, larger samples would allow for separate analyses of psychological, physical, and sexual aggression.

Another possible limitation is that the daily reports were completed in the context of a weekly questionnaire so that the weekly situational event could be examined. Although uncommon, late submissions were permitted as has been true in other studies (e.g., Derrick et al., 2014). The present study did not monitor whether the participants actually completed the reports daily. As suggested by Elkins, Moore, McNulty, Kivisto, and Handsel (2013), participants may have completed many daily accounts simultaneously, which may have introduced a possible retrospective recall bias (Hamberger & Guse, 2002). In addition, using interactive voice technology (Derrick et al., 2014), a time-varying effect model (Buu et al., 2020), or texting might have produced more accurate results. Despite the possible inaccuracies that may have resulted from some retrospective reporting on the weekly questionnaires, the potential recall period seems short enough that significant lapses or distortions of memory seem unlikely (Wolfer, 1999).

It remains unclear whether the current results will generalize to young adults and dating couples who do not attend college. In addition, these data were collected in 2000–2001. Given that cannabis is now legal in many states, the frequency and amount of cannabis use among college students as well as the relation between substance use and dating violence may have changed in the intervening years. Future studies would also benefit from: (a) gathering reports from both members of the couple (especially when substance use may not have been observed directly), (b) considering bidirectional violence more fully, (c)

corroborating self-reports of substance use (e.g., breathalyzer readings or urine drug screens), and (d) further assessing the temporal ordering of substance use and dating violence in estimating day-to-day associations (Rothman, Stuart, Temple, & Heeren, 2018).

The present investigation has several implications for policy and intervention. First, efforts to prevent dating violence need to consider alcohol and drug use as important risk factors worthy of assessment and intervention. As known from clinical trials, intimate partner violence decreases after men reduce their drinking following participation in alcohol treatment (e.g., O'Farrell, Murphy, Neavins, & Van Hutton, 2000; Stuart et al., 2003), and untreated problematic drinking is associated with men continuing to perpetrate relationship violence even after completing intimate partner violence treatment (Neavins, Murphy, Elliott, & Morrel, 1999). Thus, it is reasonable to conclude that interventions with non-clinical, dating samples might reduce both substance use and dating violence. In the present study, moderate use patterns as well as binge drinking were associated with elevated risk of dating violence. Education and social awareness campaigns may need to advise those in dating relationships to avoid addressing conflict when either partner has been using any substances, a common recommendation made in substance use treatment (e.g., O'Farrell & Fals-Stewart, 2000). Second, the risk associated with substance use appears to involve a broad range of dating violent behaviors, not simply the most pernicious forms (e.g., severe physical assault). Prior studies have indicated that psychological aggression predicts the emergence and extent of physical aggression among newlywed samples (e.g., Leonard & Senchak, 1996). These findings suggest the importance of funding early intervention to detect and mitigate risk factors (Moore et al., 2011) in order to prevent escalation of dating violence. Relatedly, having readily-available campus resources for treating substance use issues (Moore et al., 2011), highlighting the connection between substance use and dating violence, and targeting reducing alcohol consumption by all college students when designing programs to prevent dating violence, are all imperative (Roudsari et al., 2009; Shorey et al., 2011). Finally, the present findings may be helpful in increasing the awareness and understanding of college students, staff, parents, therapists, and policy-makers regarding the frequency with which both men and women engage in dating violence, the links to substance use, and the potential importance of campus activities designed to promote healthy relationships and to reduce the problematic use of alcohol and drugs.

## 5. Conclusions

The current findings add to a growing body of research showing that alcohol use increases the risk of dating violence at the day-to-day level. By providing reports of daily substance use and abusive relationship behaviors, female participants essentially served as their own controls, and the results indicate that the risk of dating violence is roughly doubled on alcohol use versus sober days. In addition, the current findings extend prior research on college dating samples to include analysis of other drug use, which was also associated with an increased risk for dating violence that was significant for women's report of their own dating violence, but not for their reports of male partners' violence. Moreover, the current study extended prior research through a detailed analysis of specific weekly relationship events, demonstrating that the extent of alcohol use (i.e., estimated BAC levels and binge drinking) is associated with the severity of dating violence. Taken together with prior studies, the current findings support theoretical accounts focused on the proximal influence of substance use on dating violence, and help rule out third variable accounts that explain the link between substance use and dating violence solely as a function of individual difference factors such as impulsivity or hostility. Furthermore, this growing body of research highlights the critical importance of targeting reductions in alcohol and drug use in efforts to prevent dating violence in emerging adulthood.

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