University of Wisconsin Milwaukee

UWM Digital Commons

May 2020

Simultaneous Marijuana and Alcohol Use and Intimate Partner Violence Perpetration in College Students

Haley Kolp
University of Wisconsin-Milwaukee

SIMULTANEOUS MARIJUANA AND ALCOHOL USE AND INTIMATE PARTNER

VIOLENCE PERPETRATION IN COLLEGE STUDENTS

by

Haley Kolp

A Thesis Submitted in

Partial Fulfillment of the

Requirements for the Degree of

Master of Science

in Psychology

at

The University of Wisconsin-Milwaukee

May 2020

ABSTRACT

SIMULTANEOUS MARIJUANA AND ALCOHOL USE AND INTIMATE PARTNER
VIOLENCE PERPETRATION IN COLLEGE STUDENTS

by

Haley Kolp

The University of Wisconsin-Milwaukee, 2020
Under the Supervisor of Professor Ryan Shorey

Intimate partner violence (IPV) victimization is a prevalent public health problem in
college students and is associated with a variety of negative outcomes, such as suicidal ideation
and depressive symptoms. Alcohol use and IPV perpetration are strongly and positively
associated in college students, but the literature is less clear when examining the relationship
between marijuana use and IPV perpetration. Further, no study has examined the relationship
between simultaneous marijuana and alcohol (SAM) use (i.e., using alcohol and marijuana at the
same time so that the effects overlap) and IPV perpetration in college students. Thus, the current
thesis cross-sectionally examined the association between SAM use and physical, sexual, and
psychological IPV perpetration in college students ($N = 534$). Results indicated that SAM use
was significantly and positively associated with sexual IPV perpetration ($B = 0.10$, $p < .01$) and
verbal/emotional IPV perpetration ($B = 0.04$, $p < .01$), after controlling for negative urgency,
alcohol use, and marijuana use. For women, SAM use was significantly and positively associated
with physical IPV perpetration ($B = 0.13$, $p < 0.05$), threatening behavior IPV perpetration ($B = 0.10$, $p < 0.01$), sexual IPV perpetration ($B = 0.10$, $p < 0.01$), and verbal/emotional IPV
perpetration ($B = 0.06$, $p < 0.01$). For men, SAM use was significantly and *negatively* associated
with physical IPV perpetration ($B = -0.56$, $p < 0.01$) and threatening behavior IPV perpetration

(B = -0.18, p < 0.01). Results indicate the importance of targeting SAM use to reduce IPV

perpetration in college students.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

IPV	Intimate Partner Violence
SAM	Simultaneous Alcohol and Marijuana
AMT	Alcohol Myopia Theory
AUDIT	Alcohol Use Disorders Identification Test
CUDIT-R	Cannabis Use Disorders Identification Test – Revised
SAM-USE	Simultaneous Alcohol and Marijuana Use Scale
DFAQ-CU	Daily Sessions, Frequency, Age of Onset, and Quantity of Cannabis Use Inventory
CADRI	Conflict in Adolescent Dating Relationship Inventory
VIF	Variance Inflation Factors
MLR	Maximum Likelihood Parameter
MGM	Multiple Group Model

Simultaneous Marijuana and Alcohol Use and Intimate Partner

Violence Perpetration in College Students

Intimate partner violence (IPV) can include psychological (e.g., insults, threats), physical

(e.g., slapping, punching), and sexual abuse (e.g., touching a partner sexually against their will),

and remains a significant public health problem despite efforts to reduce it. In national samples,

nearly 30% of young adults report experiencing physical or sexual IPV by the age of 26

(Reingle, Staras, Jennings, Branchini, & Maldonado-Molina, 2012). In college students, sexual

violence occurs in 15-25% of dating relationships, psychological abuse occurs in 50-80% of

relationships, and physical violence occurs in 20-30% of relationships annually (Shorey, Stuart,

& Cornelius, 2011; Straus, 2004). Further, on average, 7% of college students report physically

injuring a partner, with approximately 9% of students reporting they had severely assaulted (e.g.,

choked, kicked, burned) a partner within the previous 12 months (Straus, 2004). Male and female

college students both perpetrate IPV at similar rates, with violent couples tending to mutually

perpetrate IPV (e.g., Katz, Kuffel, & Coblentz, 2002; Straus & Gozjolko, 2014). However, males

perpetrate sexual IPV more frequently than females (Swan, Gambone, Caldwell, Sullivan, &

Snow, 2008). Thus, it is important to consider both males and females as perpetrators of IPV.

Additionally, IPV victimization is associated with a variety of negative outcomes in

college students, such as increased suicidal ideation (Wolford, Vann, & Smith, 2016), health

problems (Romito & Grassi, 2007), depressive symptoms, and anxious symptoms (Shorey et al.,

2011). Further, research has demonstrated that all three types of IPV victimization

(psychological, physical, and sexual) is associated with negative outcomes in both males and

females. For instance, among college students that reported experiencing high levels of IPV,

there were no differences between males and females in terms of the amount of depression,

anxiety, or somatization symptoms reported (Próspero, 2007). There is some research, however, which demonstrates female victims of IPV tend to experience more severe outcomes (e.g., physical injuries, greater mental health problems) than male victims, but male victims are still at risk for negative outcomes after experiencing IPV (Caldwell, Swan, & Woodbrown, 2011). Thus, there is a need for research to examine ways to reduce IPV among college students. This is facilitated by research on risk factors for IPV perpetration, which can inform the development of prevention programs. In the present thesis, I examined whether alcohol used simultaneously with marijuana imparted risk for IPV perpetration in college students.

Alcohol and IPV Perpetration

Research has demonstrated a robust association between alcohol and IPV perpetration in adolescent (e.g., Temple, Shorey, Fite, Stuart, & Le, 2013), young adult (e.g., Shorey, Stuart, & Cornelius, 2011), and adult populations (e.g., Testa & Derrick, 2014; Stith, Smith, Penn, Ward, & Tritt, 2004). A literature review of cross-sectional studies found that alcohol use is consistently, and positively, related to IPV perpetration in male and female college students (Shorey, Stuart, & Cornelius, 2011). This review reported that different indicators of alcohol use (e.g., estimated blood alcohol concentration levels; frequency of drinking; alcohol-related problems) have been shown to be positively associated with IPV perpetration.

Daily diary studies have demonstrated additional support for this association in college students. For instance, a daily diary study in college women demonstrated that alcohol use temporally preceded and increased the odds of psychological and physical IPV perpetration (Shorey, Stuart, Moore, & Mcnulty, 2014). A daily diary study in college men found similar results (Shorey, Stuart, Mcnulty, & Moore, 2014). On alcohol use days and heavy alcohol use days (classified as 5 or more standard drinks in a day), the likelihood of physical and sexual IPV

perpetration increased. Alcohol use was only related to psychological IPV perpetration on heavy use days (Shorey et al., 2014). Another daily diary study in college students demonstrated that the odds of perpetrating physical and psychological IPV increased on days in which alcohol was used (Moore, Elkins, Mcnulty, Kivisto, & Handsel, 2011). Indeed, some researchers have concluded that the relationship between alcohol and IPV is causal (Leonard, 2005; Leonard & Quigley, 2017). Thus, it is clear that alcohol use is positively related to physical, sexual, and psychological IPV perpetration as evidenced by both cross-sectional and daily diary studies.

Marijuana and IPV Perpetration

The current literature is less clear in terms of the relationship between marijuana use and IPV perpetration. Cross-sectional studies have provided support for a positive relationship between marijuana use and IPV. For instance, a study with college students demonstrated a positive relationship between frequency of past-year marijuana use and physical IPV perpetration (Nabors, 2010). Another study found that among men who were arrested for domestic violence, marijuana use frequency was positively associated with psychological, sexual, and physical IPV perpetration, even after controlling for relationship satisfaction, alcohol use and problems, and antisocial personality symptoms (Shorey et al., 2018). A study focusing on adult community couples discovered that in couples where both partners used marijuana, there was elevated risk for male-to-female physical IPV perpetration (Cunradi, Todd, & Mair, 2015). In couples where only the husband used marijuana, the couple was at increased risk for female-to-male physical IPV perpetration (Cunradi et al., 2015).

Studies using more robust methods have demonstrated further support for the link between marijuana use and IPV perpetration. For instance, a longitudinal study with young adults determined that adolescent marijuana use was associated with physical IPV perpetration in

3

adulthood (Reingle et al., 2012). A daily diary study in college women demonstrated that marijuana use preceded and temporally increased risk for psychological, but not physical, IPV perpetration, even after accounting for alcohol use (Shorey et al., 2014). Another study focusing on community couples utilized ecological momentary assessment to find that marijuana use was positively associated with verbal aggression and intimate partner conflict, even after controlling for alcohol use (Testa, Wang, Derrick, & Leonard, 2018). Further, a recent literature review of marijuana use and physical IPV in adolescents and young adults (age range 11-21 years old) found that marijuana use increased the likelihood of physical IPV perpetration by 45% (Johnson et al., 2017).

Other studies have found conflicting results. For example, a daily diary study in college men did not find a temporal relationship between marijuana and any type of IPV (Shorey et al., 2014). Another study examined women who had been arrested for IPV and found that these women were *less likely* to perpetrate physical violence on days in which marijuana was used (Stuart et al., 2013). Another study examined male and female criminal offenders with suspected drug involvement and found that marijuana use and physical IPV perpetration were not directly associated (Crane, Oberleitner, Devine, & Easton, 2014). A longitudinal study investigated couples' marijuana use and reports of IPV for the first 9 years of marriage, and determined that marijuana use was inversely related to IPV perpetration, in that more frequent marijuana use by either partner predicted less frequent physical IPV perpetration (Smith et al., 2014). One exception was found, in that if the wife had perpetrated IPV the year prior to being married, the wives' marijuana use was positively related to wife-to-husband IPV perpetration (Smith et al., 2014). Additionally, a recent study utilizing ecological momentary assessment with community couples found that marijuana use did not predict physical perpetration two hours later (Testa et

4

al., 2018). Overall, there is evidence that marijuana use may be related to certain types of IPV, namely psychological and sexual violence. There are currently mixed findings regarding the relationship between marijuana use and physical IPV, indicating a need for further investigation in this area.

Simultaneous Alcohol and Marijuana Use and IPV Perpetration

In a large study utilizing data from the National Alcohol Survey, marijuana was discovered to be the most commonly used drug of individuals that drink alcohol, other than tobacco (Subbaraman & Kerr, 2015). Individuals who use marijuana and alcohol were two times more likely to use them simultaneously (e.g., using marijuana and alcohol at the same time so that the effects overlap) as opposed to concurrently (Subbaraman & Kerr, 2015). In young adults and college students, studies have demonstrated that nearly half of marijuana users report using alcohol simultaneously (Haas et al., 2015; Subbaraman & Kerr, 2015). Simultaneous alcohol and marijuana (SAM) use can increase the risk for negative outcomes to a greater degree than when only one substance is used, such as increased risk of substance use problems in the future, increased depressive symptoms, and increased risk of health problems (Green et al., 2016; Midanik, Tam, & Weisner, 2007; Subbaraman & Kerr, 2015). Studies have also shown SAM users were more likely to experience social consequences (e.g., got in a fight while drinking), cause harm to oneself, and experience more alcohol-related problems (e.g., blackouts, drinking more than intended) compared to alcohol users only (Midanik et al., 2007; Subbaraman & Kerr, 2015). Further, a study with co-users of marijuana and alcohol (i.e., individuals who use both marijuana and alcohol but not necessarily at the same time) demonstrated that individuals who co-used both substances had increased impulsivity, a known risk factor of IPV (Derefinko, Dewall, Metze, Walsh, & Lynam, 2011), compared to individuals who were heavy alcohol users

only (Peters et al., 2012). Overall, there are serious outcomes associated with SAM use, especially in young adults. With the increasing legalization of marijuana, it is important to understand the risks associated with SAM use, including whether it increases risk for IPV perpetration.

However, no known research has examined the association between SAM use and IPV perpetration. Existing research that has examined co-users of alcohol and marijuana can provide insight into whether SAM use may be associated with IPV perpetration. One study with men arrested for domestic violence demonstrated that alcohol use and problems interacted with marijuana use frequency to cross-sectionally predict sexual, but not physical or psychological, IPV perpetration (Shorey et al., 2018). More specifically, Shorey and colleagues (2018) found that marijuana use frequency was related to sexual IPV at high levels of alcohol use and problems, but not at low levels of alcohol use and problems. Another study utilizing longitudinal data examined differences between co-using alcohol and marijuana couples and couples that did not use either substance. Results indicated that men and women who co-used alcohol and marijuana experienced more psychological and sexual IPV perpetration and victimization than males and females who did not use either substance (Low, Tiberio, Shortt, Capaldi, & Eddy, 2017). Data from the National Epidemiologic Survey on Alcohol and Related Conditions found other results. In this study, the researchers found that if individuals had a diagnosis of both alcohol use disorder and cannabis use disorder, the likelihood of IPV perpetration was decreased as compared to being diagnosed with either individual disorder (Smith, Homish, Leonard, & Cornelius, 2011). Overall, the current literature is lacking in regard to the relationship between SAM use and IPV, particularly among young adults.

Theoretical Considerations

One well-supported theory to explain the relationship between alcohol and violence is Alcohol Myopia Theory (AMT; Steele & Josephs, 1990). AMT states that acute alcohol use restricts an individual's capacity for attentional processing; therefore the individual only focuses on a narrow amount of information while consuming alcohol (alcohol myopia; Giancola, Josephs, Parrott, & Duke, 2010). Thus, according to AMT, in the context of conflict with an intimate partner, an individual will focus on the most salient cues (e.g., negative affect due to partner conflict) and pay less attention to inhibitory processes that might otherwise stop them from perpetrating violence (e.g., legal outcomes; Eckhardt, Parrott, & Sprunger, 2015). Overall, AMT is the prominent theory used to explain alcohol-related IPV and has been supported in prior research, including laboratory studies (e.g., Gallagher & Parrott, 2011) and daily diary studies (e.g., Moore et al., 2011; Shorey et al., 2014).

Whereas the association between alcohol and IPV perpetration has strong theoretical support, there is a lack of existing theory regarding the relationship between marijuana and IPV perpetration. A heuristic model has been proposed to help explain this relationship (Testa & Brown, 2015). This model states that marijuana use has negative effects, such as disinhibition and restricted attentional and cognitive processing (Fried, Watkinson, & Gray, 2005; Mathias et al., 2011; McDonald, Schleifer, Richards, & de Wit, 2003). Thus, these effects may increase an individual's likelihood to commit IPV by restricting their ability to respond to conflict without violence (Testa & Brown, 2015). Additionally, individual characteristics, such as marijuana use expectancies and antisocial personality, may increase an individual's likelihood to experience negative affect as a result of marijuana use. For instance, marijuana use expectancies can affect how anxious an individual feels during marijuana intoxication (Metrik, Kahler, McGeary, Monti,

& Rohsenow, 2011). Thus, the heuristic model states that individuals with certain characteristics may be at increased risk for IPV perpetration when using marijuana in certain situations and settings. Overall, theory regarding the relationship between marijuana use and IPV perpetration is nonspecific and needs further elucidation.

No theory exists to explain the relationship between SAM use and IPV. Prior research has demonstrated that both alcohol and marijuana use are linked to increased disinhibition (Skosnik, Spatz-Glenn, Park, 2001; Weafer & Fillmore, 2015). Disinhibition effects have been linked to an increased likelihood to perpetrate IPV (e.g., Giancola, Josephs, Parrot, & Duke, 2010). Further, previous research has demonstrated that SAM use effects are additive, in that the effects of alcohol and marijuana are compounded (Chait & Perry, 1994). One study showed that SAM use is linked to certain disinhibiting effects, such as experiencing feelings of confusion and having difficulty concentrating (Lee, Cadigan, & Patrick, 2017). Therefore, it is possible that the disinhibiting factors associated with alcohol use combines with disinhibiting processes in marijuana use to produce compounded effects in SAM use. These effects may decrease an individual's ability to resolve conflict with their partner, therefore increasing their likelihood of engaging in IPV. However, this is speculative in the absence of empirical research directly examining the association between SAM use and IPV perpetration.

Further, research has suggested that the relationship between marijuana and IPV perpetration may be explained by common third factors related to both marijuana and IPV, such as individual characteristics (Moore & Stuart, 2005). Thus, it is possible this is also the case for the relationship between SAM use and IPV. One such individual characteristic that may be a common third factor in the relationship between SAM use and IPV perpetration is impulsivity. One study examining the co-use of marijuana and alcohol found that co-users had increased

impulsivity when compared to alcohol-only users (Peters et al., 2012), indicating that impulsivity may be associated with SAM use. Prior research has suggested negative urgency (impulsive action in response to negative emotions), a facet of impulsivity, is related to IPV perpetration (Derefinko, DeWall, Metze, Walsh, & Lynam, 2011; Peters, Derefinko, & Lynam, 2017). Thus, negative urgency was chosen as a covariate in the present study.

Proposed Study

IPV is a major public health problem that impacts college populations at an alarming rate. Previous research has shown that there is a strong link between alcohol use and IPV in college students, such that alcohol increases the likelihood of physical, psychological, and sexual IPV perpetration. The literature is less clear when it comes to the impact of marijuana on IPV. The small body of research on marijuana and IPV demonstrates that marijuana may increase the risk for psychological and sexual IPV, but there is conflicting research when examining the relationship between marijuana and physical IPV. However, there is no existing research examining the relationship between SAM use and IPV. Theoretically, SAM use may combine the disinhibiting factors of alcohol and marijuana to increase an individual's risk of perpetrating IPV by reducing their ability to resolve conflict with their partner, but this is speculative and has not been investigated in the empirical literature.

<center>**Study Aims**</center>

Based on the above research and theory, the following aims were proposed.

Aim 1: Examine the relationship between SAM use and IPV perpetration (psychological, physical, and sexual).

Aim 2: Examine sex differences in the relationship between SAM use and IPV perpetration.

Due to no known research on SAM use and IPV perpetration and minimal theoretical guidance for the relationship between SAM use and IPV perpetration, no a priori hypotheses were made.

The current study will assist in filling the gap in the literature regarding the relationship between SAM use and IPV perpetration in college students. Though the current study investigated SAM use patterns as related to IPV perpetration, it will inform whether future, in-depth investigations utilizing more robust methodology (e.g., event-level methods, such as daily diaries) are warranted.

Method

Participants

The present study recruited 696 undergraduate students at a Midwestern university. To be eligible for the study, participants had to be 18 years or older, had used alcohol in the past 12 months, had used marijuana in the past 12 months, and been involved in a dating relationship lasting at least one month in the past 12 months. A total of 162 participants were removed because they had not used alcohol within the past 12 months ($n = 6$), had not used marijuana within the past 12 months ($n = 64$), were not a member of a dating relationship lasting at least one month in the past 12 months ($n = 72$), and did not correctly answer attention check questions ($n = 20$). After removal of these participants, a final sample of 534 participants was utilized. The majority of undergraduate students reported that their sex assigned at birth was female (67.6%). In terms of gender identity, 169 identified as male, 357 identified as female, and 8 identified as transgender, genderqueer, gender nonconforming, or preferred not to answer. The majority (88.4%) of participants identified as White, 6.7% identified as Black/African American, 3.2% identified as Multiracial, 2.2% identified as Asian, 1.5% identified as American Indian or Alaska Native, 0.9% identified as Other, 0.7% identified as Middle Eastern, and 0.4% identified as

Native Hawaiian or Other Pacific Islander. The majority of participants identified as not Hispanic or Latino (91.9%). The average age of the participants was 19.04, with a range from 18 to 28 years old ($SD = 1.66$). The majority of participants were first year students (55.9%), followed by sophomores (24.6%), juniors (10.7%), and seniors (8.3%). The majority of the sample identified as exclusively heterosexual (77.7%) and were currently in a relationship with their partners (60.8%). Of those currently in a relationship, the average relationship length was 15.56 months ($SD = 18.4$ months).

Procedure

Participants were recruited using the Psychology Department's Human Subject Pool. Data were collected from both the Spring 2018 and Fall 2018 semesters. Before participation, interested students viewed an advertisement for the study that detailed eligibility criteria, approximate duration of the study, and the credit amount they would receive. Participants were provided an informed consent at the beginning of the study and were able to move onto the next page after 3 minutes, to encourage thorough reading of the informed consent. After consenting, participants completed surveys on Qualtrics.com. The surveys included "attention check" items to identify questionable responses and ensure participants were paying close attention to the questions. Once the surveys were complete, participants viewed a debriefing form detailing the purpose of the study, providing the primary investigator's and faculty sponsor's contact information, and contact information for local mental health resources. Completion of all study procedures took approximately one hour. The Institutional Review Board approved all procedures prior to data collection.

Measures

  Demographic questionnaire. A demographic questionnaire was utilized to collect information on sex, gender identity, age, year in college, race, ethnicity, sexual orientation, and current relationship status.

  Alcohol use. The Alcohol Use Disorders Identification Test (AUDIT) was used to examine alcohol use and problems (Saunders, Aasland, Babor de la Fuente, & Grant, 1993). The AUDIT is a ten-question self-report measure that asks participants about their alcohol use (e.g., "How often did you have a drink containing alcohol during the past 12 months?") and alcohol-related problems (e.g., "How often during the past 12 months did you find that you were not able to stop drinking once you had started?") over the past twelve months (Saunders et al., 1993). AUDIT scores can range from 0 to 40, with higher scores indicating more alcohol use and alcohol-related problems. The first three questions measure the amount of alcohol intake that occurred in the past 12 months. The next seven questions assess dependence and alcohol-related problems.

  The AUDIT has been shown to be a reliable and valid measure for use in college students (Lundin, Hallgren, Balliu, & Forsell, 2015; O'Hare & Sherrer, 1999). A review of 18 studies that utilized the AUDIT revealed good internal consistency (Cronbach's alpha in the .80's) and evidence of two-week test-retest stability (r's ranging from .64 to .92; Reinert & Allen, 2002). A more recent review of 47 studies that utilized the AUDIT discovered a sensitivity value of .76 and a specificity value of .79 when using a cut-off point of 9 to identify potentially hazardous drinking (de Meneses-Gaya, Zuardi, Loureriro, & Crippa, 2009). The internal consistency in the current sample was good ($\alpha = .77$).

Marijuana use. Marijuana use was examined using the Cannabis Use Disorders

Identification Test – Revised (CUDIT-R; Adamson et al., 2010). The CUDIT-R is an 8-item

measure that examines patterns of marijuana use (e.g., "How many hours were you "stoned" on a

typical day when you had been using cannabis in the past 12 months?"), marijuana problems

(e.g., "How often during the past 12 months did you fail to do what was normally expected from

you because of using cannabis?"), marijuana dependence (e.g., "How often during the past 12

months did you find that you were not able to stop using cannabis once you had started?"), and

psychological components of marijuana use (e.g., "How often in the past 12 months have you

had a problem with your memory or concentration after using cannabis?"), with 2 items

dedicated to each domain (Adamson et al., 2010). The CUDIT-R asks participants to consider

their marijuana use over the past 12 months. CUDIT-R scores are calculated by utilizing a

summed total score, for a range of scores from 0 to 32, with higher scores indicating increased

cannabis use and related problems.

The CUDIT-R was developed by modifying the AUDIT and has demonstrated high

levels of specificity and sensitivity for identifying current cannabis use disorder (90% and 91%,

respectively; Adamson et al., 2010). A preliminary cut-off score of 13 has been proposed to

identify individuals with a probable cannabis use disorder, with 91% of individuals with a

current cannabis use disorder scoring at or above this score, and 90% of individuals without a

current cannabis use disorder scoring below 13 (Adamson et al., 2010). Additionally, the

CUDIT-R was shown to have discriminant validity in identifying cannabis abuse and cannabis

dependence (Adamson et al., 2010). The internal consistency for the CUDIT-R is excellent

(Cronbach's alpha = .91) and the CUDIT-R has demonstrated good test-retest reliability ($r = .87$;

Adamson et al., 2010). The internal consistency in the current sample was good ($\alpha = .78$).

SAM Use. SAM use was assessed using the Simultaneous Alcohol and Marijuana Use (SAM-USE) Scale (Kolp et al., 2019), which was modeled after the AUDIT (Sanders et al., 1993), the CUDIT-R (Adamson et al., 2010), and the Daily Sessions, Frequency, Age of Onset, and Quantity of Cannabis Use Inventory (DFAQ-CU Inventory; Cuttler & Spradlin, 2017). The SAM-USE Scale wording was adapted from Patrick, Fairlie, and Lee (2018), in which the authors used a single question to assess SAM use in young adults with the phrase, "so that the effects of marijuana and alcohol overlapped." This 9-item questionnaire asks participants to answer questions about their use of alcohol and marijuana at approximately the same time, so that the effects of each substance overlapped, in the past 12 months.

The SAM-USE scale was developed utilizing exploratory and confirmatory factor analyses from two independent samples of college students. The factor analyses demonstrated that the SAM-USE scale has two factors measuring two different facets of SAM use. One factor assesses frequency and quantity of SAM use (e.g., "How often did you use both alcohol and marijuana on the same occasion during the past 12 months, so that the effects of alcohol and marijuana overlapped?") and the other examines SAM-use related problems (e.g., "How often during the past 12 months did you fail to do what was normally expected from you because of using both marijuana and alcohol on the same occasion, so that the effects of alcohol and marijuana overlapped?"). Four questions make up factor one and 5 questions make up the second factor. SAM-USE scale scores can be calculated by either utilizing an overall total score or using total scores from either factor by summing the appropriate items together. The total score can range from 0 to 36, with higher scores indicating more SAM use and related problems. The total score for factor 1 (SAM use frequency and quantity) can range from 0 to 16 and the total score for factor 2 (SAM use-related problems) can range from 0 to 20, with increasing scores

indicating more SAM use or more related problems, respectively. For the present proposal, the total SAM-USE scale score was utilized. The internal consistency of the total scale was good (α = .70). The internal consistency of factor 1 was good (α = .68) and the internal consistency of factor 2 was adequate (α = .59).

IPV Perpetration. The Conflict in Adolescent Dating Relationship Inventory (CADRI; Wolfe et al., 2001) was utilized to measure IPV perpetration. The CADRI is a self-report measure that assesses abusive behaviors within dating relationships (Wolfe et al., 2001). The CADRI includes 50 items that measure physical abuse (e.g., "I kicked, hit, or punched him/her"), sexual abuse (e.g., "He/She touched me sexually when I didn't want him/her to"), verbal/emotional abuse (e.g., "I threatened to end the relationship"), relational abuse (e.g., He/She spread rumors about me), and threatening behavior (e.g., "I destroyed or threatened to destroy something he/she valued"; Wolfe et al., 2001). The CADRI splits psychological aggression into two scales: verbal/emotional abuse and threatening behavior. For the present thesis, all subscales were utilized with the exception of the relational abuse subscale, as this subscale is seldomly used in IPV research. At the beginning of the CADRI, the instructions ask participants to consider the questions based on the past 12 months of their current or most recent dating relationship. The CADRI contains questions regarding both victimization and perpetration of abusive dating behaviors, with 25 questions asking about perpetration and 25 questions mirroring the same language but asking about victimization (e.g., "I blamed him/her for the problem" versus "He/She blamed me for the problem"). For the present study, only the perpetration scales were utilized. Consistent with other measures of IPV (e.g., the Revised Conflict Tactics Scales; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) there are 7 response options available for each question: this never happened; once in the past 12 months; twice in the

past 12 months; 3-5 times in the past 12 months; 6-10 times in the past 12 months; 11-20 times in the past 12 months; more than 20 times in the past 12 months; and not in the past 12 months, but it did happen before. The CADRI is scored by utilizing the midpoint of each item (e.g., the response option of 3-5 times is scored as a 4) and summing these scores to create a total score. The response option "not in the past 12 months, but it did happen before" is scored as a 0 and is not included in the total score.

The CADRI is among one of the most studied IPV measures, has been subject to more rigorous psychometric investigations than other, similar measures, and has been shown to identify separate constructs relative to other measures of IPV in young adult populations (e.g., the Revised Conflict Tactics Scales; Cascardi & Muzyczyn, 2016; Kinsfogel & Grych, 2004). Additionally, the factor structure of the CADRI has been supported and shown to be consistent across time, race/ethnicity, and sex (Shorey et al., 2019). The internal consistencies for the current sample were good for the physical abuse perpetration (α = .77), excellent for verbal/emotional abuse perpetration (α = .92), adequate for sexual abuse perpetration (α = .62), and adequate for threatening behavior perpetration (α = .63).

Negative Urgency. The UPPS-P Impulsive Behavior Scale was utilized to assess negative urgency (Cyders et al., 2007; Whiteside & Lynam, 2001). The UPPS-P is a 59-item self-report measure that assess five facets of impulsivity. For the current proposal, the negative urgency (tendency to act impulsively in times of negative affect) subscale was utilized. There are 12 items that make up the negative urgency subscale (e.g., "When I feel bad, I often do things I later regret in order to make myself feel better now"). Participants are instructed to rate how much they agree or disagree with each statement on a scale from 1 ("agree strongly") to 4 ("disagree strongly"). Higher scores on this scale correspond to increases in negative urgency.

16

The UPPS-P scales have good convergent validity (Cyders et al., 2007) and measurement and structural invariance across sex (Cyders, 2013). Good discriminant validity has been noted between the traits, along with excellent internal consistency for the negative urgency subscale at an alpha of .87 (Cyders et al., 2007; Smith et al., 2007). Further, the UPPS-P has been validated in college students (e.g., Cyders et al., 2007) and has demonstrated good sensitivity in predicting pathology (e.g., alcohol use disorder; Whiteside & Lynam, 2001). The internal consistency of the negative urgency subscale in the current sample was excellent ($\alpha = .90$).

Sample Size Determination

G*Power software was used to determine the sample size for the study (Faul, Erdfelder, Buchner, & Lang, 2009). A power analysis utilizing linear regression was conducted with four predictors (SAM use, negative urgency, alcohol use, and marijuana use) and four outcome variables (physical IPV perpetration, sexual IPV perpetration, threatening behavior perpetration, and verbal/emotional IPV perpetration), power equal to 0.80, a two-tailed test with an alpha of 0.05, and a small-to-medium effect size (0.02-0.15; f^2). Previous literature examining alcohol and marijuana use and IPV perpetration was used to determine the effect sizes for the current power analysis, which indicate small-to-medium effects (Cafferky, Mendez, Anderson, & Stith, 2018; Foran & O'Leary 2008; Moore et al., 2008). A sample size of 85 (medium effect) to 602 (small effect) was determined. When the effect size was entered as 0.03, a sample size of 403 was determined. Therefore, the current sample size of 534 was underpowered to detect a very small effect size and was otherwise suitable to detect medium-to-small effects.

Data Analytic Plan

To begin, study variables were assessed for skew and kurtosis, as violence variables have been shown to be positively skewed and kurtotic (e.g., Shorey, Brasfield, Febres, Cornelius, &

Stuart, 2012). Then, bivariate correlations were conducted in SPSS version 25 between all predictor (SAM use), covariate (alcohol use, marijuana use, negative urgency), and outcome variables (physical, sexual, verbal/emotional, and threatening IPV perpetration). Variance Inflation Factors (VIF) and tolerance values were utilized to examine multicollinearity between the independent variables

After this, Poisson regression analyses were conducted in Mplus version 8 to investigate the relationship between SAM use and physical, sexual, verbal/emotional, and threatening IPV perpetration while controlling for alcohol use, marijuana use, and negative urgency. A Poisson distribution was specified because a Poisson model is appropriate for use with count data that is positively skewed (Joe & Zhu, 2005). There are several advantages to using Mplus over SPSS when conducting regression analyses. Mplus uses the maximum likelihood parameter (MLR) estimator, which estimates with standard errors, making it more robust to non-normal data (Muthén & Muthén, 2006). Additionally, Type 1 error is less of a concern when using Mplus compared to SPSS as all dependent variables will be entered in one model, reducing the number of analyses conducted. I created a fully saturated model that has 0 degrees of freedom by examining whether SAM use, while controlling for alcohol use, marijuana use, and negative urgency, is related to physical, verbal/emotional, sexual, and threatening behavior IPV perpetration (see Figure 1). The predictor and covariate variables all covaried and all outcome variables covaried. Fully saturated models always generate a perfect fit to the data, thus model fit indices are not reported.

After examining the overall model, I investigated whether the associations between the predictor (SAM use) and covariate (alcohol use, marijuana use, negative urgency) variables and the outcome variables (physical, verbal/emotional, sexual, and threatening IPV perpetration)

18

varied as a function of gender (male, female). To do so, I utilized the multiple group model approach (Muthén & Muthén, 2006). This approach first entails estimating an unrestricted model that allows all structural paths to vary across gender. The next step in this approach involves estimating a model in which all structural paths are equal across gender. I examined the AIC and BIC values to determine whether constricting paths to be equal across genders significantly decreased the AIC and BIC values in the model. If a significant decrease occurred, the variables can be assumed to vary as a function of gender (Muthén & Muthén, 2006). I additionally utilized the multiple group model approach to investigate whether the associations between the predictor and covariate variables and outcome variables varied as a function of relationship status (currently in a relationship or not currently dating).

Finally, I conducted exploratory analyses in which the regression models were conducted without negative urgency as a control variable. I also conducted exploratory analyses by splitting the items of the SAM-USE Scale, the AUDIT, and the CUDIT-R into indicators of (1) substance use quantity/frequency and (2) substance use-related problems. For the SAM-USE Scale measure, Factor 1 was utilized for substance use quantity and Factor 2 was utilized for substance use-related problems. Items 1-3 from the AUDIT were used to measure substance use quantity and items 4-12 were used to measure substance use-related problems (Sanders et al., 1993). Finally, items 1 and 2 from the CUDIT-R were utilized for substance use quantity and items 3-8 were used for substance use-related problems (Adamson et al., 2010). I then utilized Mplus to conduct Poisson regression analyses to investigate the relationship between 1) SAM use quantity and physical, sexual, verbal/emotional, and threatening IPV perpetration while controlling for alcohol use quantity, marijuana use quantity, and negative urgency and 2) SAM use-related problems and physical, sexual, verbal/emotional, and threatening IPV perpetration while

controlling for alcohol use-related problems, marijuana use-related problems, and negative urgency.

<div align="center">**Results**</div>

Descriptive Statistics

The majority (82.2%) of participants were past-month SAM users, with over one quarter (26.4%) reporting SAM use two to four times a month. Additionally, nearly one-third (29.9%) of participants reported binge drinking at least monthly during a SAM use episode and 36.1% endorsed drinking three to four alcoholic beverages during a typical SAM use day. Nearly half (47%) of participants met criteria for hazardous drinking on the AUDIT (a cutoff score of 9; Saunders et al., 1993). Further, 18.8% of participants met criteria for a probable cannabis use disorder on the CUDIT-R (cutoff score of 13 or over; Adamson et al., 2010). The majority (83.6%) reported verbal/emotional perpetration, 11.4 % reported sexual perpetration, 11.1% reported threatening behavior perpetration, and 13.1% reported physical perpetration in the last 12 months.

Bivariate correlations between variables (see Tables 1-3) demonstrated that the SAM-USE Scale was positively and significantly correlated with the AUDIT, CUDIT-R, verbal/emotional IPV perpetration, threatening behavior IPV perpetration, sexual IPV perpetration, and negative urgency. The AUDIT was positively and significantly correlated with the CUDIT-R, sexual IPV perpetration, verbal/emotional IPV perpetration, physical IPV perpetration, threatening behavior IPV perpetration, and negative urgency. The CUDIT-R was positively and significantly related to sexual IPV perpetration, physical IPV perpetration, verbal/emotional IPV perpetration, threatening behavior IPV perpetration, and negative urgency.

In females, the SAM-USE Scale was positively and significantly correlated with the

AUDIT, CUDIT-R, sexual IPV perpetration, verbal/emotional IPV perpetration, physical IPV perpetration, threatening behavior IPV perpetration, and negative urgency. The AUDIT was positively and significantly correlated with the CUDIT-R, sexual IPV perpetration, verbal/emotional IPV perpetration, threatening behavior IPV perpetration, physical IPV perpetration, and negative urgency. The CUDIT-R was positively and significantly related to sexual IPV perpetration, verbal/emotional IPV perpetration, and threatening behavior IPV perpetration.

In males, the SAM-USE Scale was positively and significantly related to the AUDIT, CUDIT-R, and negative urgency. The AUDIT was positively and significantly related to the CUDIT-R and negative urgency. The CUDIT-R was positively and significantly related to sexual IPV perpetration, verbal/emotional IPV perpetration, physical IPV perpetration, threatening behavior IPV perpetration, and negative urgency.

Independent samples t-tests were performed (see Table 1) to investigate gender differences between all variables. Results indicated that males scored significantly higher on the SAM-USE Scale ($M = 8.23$, $SD = 4.31$) than females ($M = 5.36$, $SD = 3.76$), $t(488) = 7.55$, $p < .001$. Males also had significantly higher CUDIT-R scores ($M = 10.48$, $SD = 5.97$) than females ($M = 7.83$, $SD = 5.55$), $t(521) = 4.97$, $p < .001$. Finally, females scored significantly higher on negative urgency ($M = 2.35$, $SD = 0.64$) than males ($M = 2.18$, $SD = 0.60$), $t(343.33) = -2.91$, $p = .004$.

The VIF and tolerance values were utilized to examine multicollinearity between the independent variables (i.e., SAM use, alcohol use, marijuana use, and negative urgency; O'Brien, 2007). All VIF and tolerance values for the independent variables were below the accepted cutoff of 10 and above the accepted cutoff of 0.10, respectively, indicating that

multicollinearity was not a concern (O'Brien, 2007). More specifically, the VIF values were as follows: 1.13 for negative urgency, 1.62 for SAM use, 1.38 for alcohol use, and 1.34 for cannabis use. The tolerance values were as follows: 0.89 for negative urgency, 0.62 for SAM use, 0.72 for alcohol use, and 0.75 for cannabis use.

Regression Analyses

As displayed in Figure 2, SAM use was significantly and positively associated with sexual IPV perpetration ($B = 0.10$, $p < .01$) and verbal/emotional IPV perpetration ($B = 0.04$, $p < .01$), after controlling for negative urgency, alcohol use, and marijuana use. There was no significant relationship between SAM use and physical IPV perpetration or threatening behavior IPV perpetration. Marijuana use was significantly and positively associated with threatening behavior IPV perpetration ($B = 0.10$, $p < 0.05$) and sexual IPV perpetration ($B = 0.05$, $p < 0.05$). Alcohol use was significantly and positively associated with negative urgency ($B = 1.01$, $p < .01$). Negative urgency was significantly associated with verbal/emotional IPV perpetration ($B = 0.57$, $p < .01$) and threatening behavior IPV perpetration ($B = 0.53$, $p < .01$).

To examine potential gender differences, MGM analysis revealed a better fit to the data when paths were not constrained to be equal across genders (AIC = 24,690.76, BIC = 24,985.06) relative to when paths were constrained to be equal across genders (AIC = 24,788.58, BIC = 24,951.23), indicating that relationships between the independent variables and dependent variables varied as a function of gender (see Table 4). For women, SAM use was significantly and positively associated with physical IPV perpetration ($B = 0.13$, $p < 0.05$), threatening behavior IPV perpetration ($B = 0.10$, $p < 0.01$), sexual IPV perpetration ($B = 0.10$, $p < 0.01$), and verbal/emotional IPV perpetration ($B = 0.06$, $p < 0.01$) after controlling for negative urgency, alcohol use, and marijuana use. For men, SAM use was significantly and *negatively* associated

with physical IPV perpetration ($B = -0.56$, $p < 0.01$) and threatening behavior IPV perpetration ($B = -0.18$, $p < 0.01$) after controlling for negative urgency, alcohol use, and marijuana use.

I also examined whether paths varied as a function of relationship status (i.e., currently dating vs. not currently dating). Results of this MGM analysis demonstrated worse model fit when paths were not constrained to be equal across relationship status (AIC = 25,323.57, BIC = 25,618,92) relative to when paths were constrained to be equal across relationship status (AIC = 24,788.58, BIC = 24,951.23), indicating no differences between participants who were currently dating versus those who were not currently dating.

Exploratory Analyses

Exploratory regression analyses examined whether results would change if negative urgency was removed as a control variable. Results demonstrated no difference in model results, relative to the original model, when negative urgency was removed as a control variable. Additionally, exploratory analyses were conducted by splitting the items of the SAM-USE Scale, the AUDIT, and the CUDIT-R into indicators of (1) substance use quantity/frequency and (2) substance use-related problems. Regression analyses conducted with the substance use quantity subscales of the SAM-USE Scale, AUDIT, and CUDIT-R revealed that SAM use quantity was significantly and positively related to verbal/emotional IPV perpetration ($B = 0.06$, $p < 0.05$; see Table 5). The regression analyses utilizing the substance use-related problems subscales of the SAM-USE Scale, AUDIT, and CUDIT-R demonstrated that SAM use-related problems were positively and significantly related to physical IPV perpetration ($B = 0.16$, $p < 0.05$) and sexual IPV perpetration ($B = 0.10$, $p < 0.05$).

Discussion

Previous studies have established a robust relationship between alcohol use and IPV perpetration (Shorey et al., 2011; Testa & Derrick, 2014) and the relationship between marijuana use and IPV perpetration is less clear (Shorey et al., 2018; Testa et al., 2018). Further, there are no current studies investigating SAM use and IPV perpetration, despite SAM use being a prevalent behavior in young adults and college students (Subbaraman & Kerr, 2015). Thus, the present study investigated the relationship between SAM use and IPV perpetration in college students. Results indicated that SAM use was positively and significantly related to sexual and verbal/emotional IPV perpetration after controlling for alcohol use, marijuana use, and negative urgency. Results did not differ depending on whether the participant was in a current relationship or not. These findings align with previous studies examining IPV in co-users of marijuana and alcohol, which suggest that users of both substances are at greater risk for IPV (e.g., Low et al., 2017), and is the first to establish that SAM use patterns are related to IPV perpetration. These findings extend our knowledge regarding the relationship between SAM use and IPV perpetration in college students, a population at increased risk for substance use and IPV. Although preliminary, these findings may indicate that SAM use should be targeted in IPV prevention programs for college students.

SAM use was not significantly related to physical or threatening behavior IPV perpetration. Studies that examined the CADRI's factor structure found that items from the threatening behavior subscale loaded onto the physical subscale, indicating potential overlap between these two CADRI subscales, and that the threatening behavior subscale may be better interpreted as physical IPV (Exner-Cortens, Gill, & Eckenrode, 2016). Therefore, it is possible these two subscales (threatening behavior and physical IPV) are measuring comparable

24

constructs and that SAM use is not associated with physical IPV perpetration. Additional research is needed to confirm this finding. Moreover, an important consideration is that the present study examined patterns of SAM use, rather than acute effects of SAM use. It is possible that results may differ when acute effects of SAM use on physical IPV perpetration are examined. Further research is necessary to continue investigating this relationship.

The present study also demonstrated gender differences in the relationship between SAM use and IPV perpetration. SAM use was positively and significantly related to physical, threatening behavior, sexual, and verbal/emotional IPV perpetration, after controlling for alcohol use, marijuana use, and negative urgency in women. In men, SAM use was *negatively* and significantly related to physical and threatening behavior IPV perpetration, after controlling for alcohol use, marijuana use, and negative urgency. This is the first study to examine gender differences in the relationship between SAM use and IPV perpetration in college students. Event-level research in college students has found similar results in that there was a temporal relationship between marijuana use and psychological IPV perpetration in women (Shorey et al., 2014b), and no relationship between marijuana use and any type of IPV perpetration in college men (Shorey et al., 2014a). Gender differences within the relationship between SAM use and IPV perpetration might be accounted for by differing SAM use motives. That is, research involving marijuana use motives indicated that women have increased odds of using marijuana to cope with negative affect compared to men (Terry-McElrath, O'Malley, & Johnston, 2009). Further, research with young adults found that a common motive for SAM use is to stay calm and to cope with problems (Patrick, Fairlee, & Lee, 2018). Thus, women may be using alcohol and marijuana simultaneously to cope with negative affect. SAM use may then increase the myopic effects associated with alcohol use, as SAM use is known to compound the effects of

both alcohol and marijuana (Chait & Perry, 1994). These myopic effects may increase women's focus on their negative affect, increasing their risk for IPV perpetration (Birkley & Eckhardt, 2015). Therefore, it is possible that gender differences in SAM use motives may be influencing the relationship between SAM use and IPV perpetration. However, existing research examining SAM use motives has not investigated gender differences and future research is needed to examine the possibility that SAM use motives explain these gender differences.

Further, it is possible that women engage in more high-risk, delinquent behaviors, such as SAM use and IPV perpetration, than men. It is possible that delinquency may be a common third variable within the relationship between SAM use and IPV perpetration for women. Prior research has indicated a relationship between alcohol use, marijuana use, intimate partner violence and delinquent behaviors and attitudes in adolescents and adults (e.g., Li et al., 2011; Stith et al., 2004). Currently, no research has examined the relationship between delinquency and SAM use. Future, event-level research is necessary to investigate the temporal relationship between SAM use and IPV perpetration and gender differences within this relationship.

Another possible explanation for the gender differences observed in the present study may be due to differences in level of intoxication from SAM use. Specifically, in the current study, males scored significantly higher on both the SAM-USE Scale and CUDIT-R compared to females. It is possible that SAM use above a certain level reduces risk for IPV perpetration, in that high levels of SAM use may make an individual too intoxicated to perpetrate IPV by losing consciousness or being too impaired to engage in physical violence. Thus, for men, using both alcohol and marijuana heavily and simultaneously may not contribute to IPV perpetration. It is important to note, however, that alcohol was related to physical and threatening behavior IPV perpetration in men. Thus, even though SAM use was not positively related to IPV perpetration

in men, alcohol still imparted risk for IPV perpetration. Overall, future research is necessary to replicate and extend these findings to determine potential explanations for gender differences in the relationship between SAM use and IPV perpetration.

Additionally, exploratory analyses in which negative urgency was removed as a control variable indicated no differences in results. Previous research has indicated that negative urgency is related to IPV perpetration (Peters, Derefinko, & Lynam, 2017). The current study's results were consistent with previous findings in that negative urgency was significantly and positively related to verbal/emotional and threatening behavior IPV perpetration when included as a control variable. When negative urgency was removed as a control variable, results did not change. Thus, it is possible that the relationship between SAM use and IPV perpetration cannot be explained by common third factors that are related to both SAM use and IPV perpetration. It is also possible that other individual characteristics may account for more variance in the relationship between SAM use and IPV perpetration (e.g., emotion regulation). Future research is necessary to continue investigating the possibility of common third variables within this relationship.

Additional exploratory analyses were conducted in which the factors of the SAM-USE Scale, AUDIT, and CUDIT-R were split by (1) substance use quantity/frequency and (2) substance use-related problems. Results indicated that when using the substance use quantity subscale of the SAM-USE Scale, SAM use quantity was significantly and positively related to verbal/emotional IPV perpetration. When utilizing the substance use-related problems subscale of the SAM-USE Scale, SAM use-related problems were positively and significantly related to physical IPV perpetration and sexual IPV perpetration. These results may indicate that SAM-use related problems (e.g., failing to do what was normally expected of you because of SAM use)

could be indicative of broader mechanisms related to IPV perpetration (e.g., emotion dysregulation). For instance, both alcohol dependence and coping-oriented marijuana use are related to poorer emotion regulation (Bonn-Miller et al., 2008; Petit et al., 2015), and emotion dysregulation is related to IPV perpetration in college students (Bliton et al., 2016). It is possible this is also true for problematic SAM use. Future research is necessary to identify the mechanism(s) for the relationship between SAM-use related problems and physical and sexual IPV perpetration. Future studies can help determine whether to target SAM use or underlying mechanisms (e.g., emotion dysregulation) within this relationship to best reduce IPV perpetration. Overall, results indicate that it may be important to target both the quantity and associated problems of SAM use to reduce IPV perpetration.

There are several limitations to consider when interpreting findings from the current study. First, the study was cross-sectional, and thus no casual conclusions can be made. That is, the current study can only be used to recognize significant relationships between patterns of behaviors. Second, participants had to self-report their substance use behavior over the past 12 months, which may lead to recall bias. Previous research has indicated that both under and over-reporting of past-year substance use can occur when participants are asked to recall this behavior (Collins, Graham, Hansen, & Johnson, 1985; Shillington, Reed, Clapp, & Woodruff, 2011). Third, the SAM-USE Scale is in the beginning stages of validation. Currently, no research exists regarding the interpretation of the SAM-USE Scale's total score or factor scores. Thus, even though we know that higher scores equate to increased SAM use-related problems and quantity of use, it is difficult to further interpret the SAM-USE Scale's scores (e.g., sensitivity and specificity of scores to predict a probable substance use diagnosis). Fourth, the current study recruited individuals who had used both alcohol and marijuana at least once in the past 12

months. It is possible that having a sample who have all consistently used marijuana and alcohol recently (e.g., past month use) may alter the relationship between SAM use and IPV perpetration. Finally, the sample identified as majority White (88.4%) and not Hispanic or Latino (91.9%) and as exclusively heterosexual (77.7%). Future research needs to be conducted in diverse populations, as the current results may not generalize to other populations (e.g., populations identifying as not exclusively heterosexual).

There are several directions for future research regarding the relationship between SAM use and IPV perpetration. Future research could utilize event-level data (e.g., daily diary assessments) to better investigate the nuances of the relationship between SAM use and IPV perpetration in college students. Indeed, prior research has indicated the importance of event-level research when examining SAM use to better investigate its acute effects (Yurasek, Aston, & Metrik, 2017). Future investigations utilizing event-level methods could investigate the temporal relationship between acute SAM use and IPV perpetration, rather than SAM use patterns, to determine whether SAM use temporally precedes and increases the odds of IPV. Additionally, future investigations should further examine gender differences between SAM use and IPV perpetration. For instance, research could investigate SAM use motives and examine whether these motives may impact the relationship between SAM use and IPV perpetration differently for men and women. Further, future research could determine whether the contexts in which men and women use alcohol and marijuana simultaneously is another potential explanation for the gender differences found in the present study. Future research can determine whether women are more likely to engage in SAM use when they are around their partners than men, therefore potentially increasing the availability of IPV perpetration.

In summary, the present study was the first study to examine the relationship between SAM use and IPV perpetration in college students. Results indicated that SAM use was significantly and positively related to sexual and verbal/emotional IPV perpetration, even after controlling for alcohol use, marijuana use, and negative urgency. Gender differences in this relationship were also evident in that SAM use was positively and significantly related to physical, threatening behavior, sexual, and verbal/emotional IPV perpetration in women and negatively and significantly related to physical and threatening behavior IPV perpetration in men. Future research, particularly event-level research, is necessary to replicate and extend these findings.
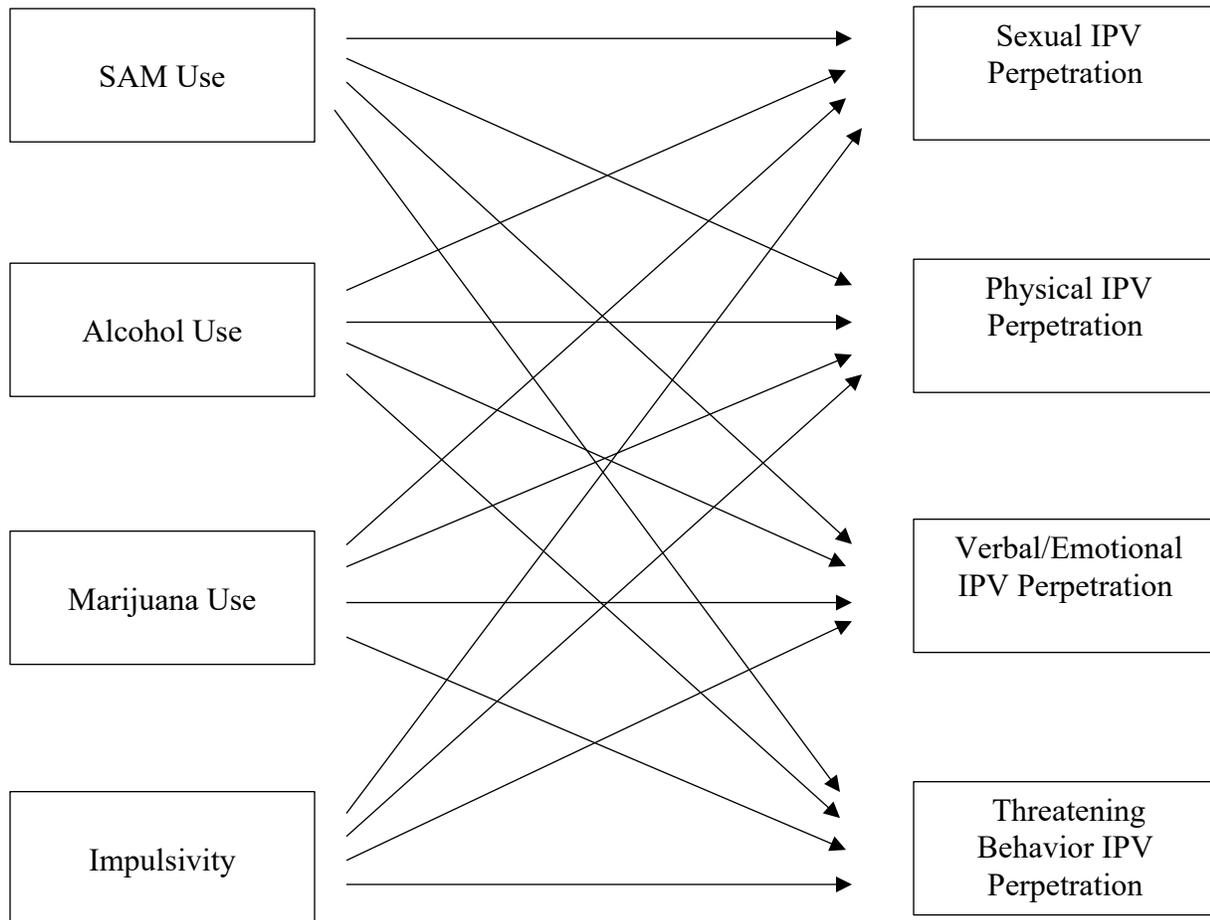
Figure 1. Proposed model for predicting IPV perpetration. Covariances among predictors, covariates, and dependent variables will be examined but are not presented for clarity.

Table 1.

Zero-Order Correlations for Study Variables

	1	2	3	4	5	6	7	8
1. SAM-USE Scale	-----	0.43**	0.49**	0.20**	0.08	0.16**	0.17**	0.12**
2. AUDIT		-----	0.14**	0.12**	0.10*	0.14**	0.09*	0.32**
3. CUDIT-R			-----	0.17**	0.12**	0.20**	0.20**	0.12*
4. Sexual IPV Perpetration				-----	0.42**	0.16*	0.39**	0.06
5. Physical IPV Perpetration					-----	0.28**	0.36**	0.08
6. Verbal/Emotional IPV Perpetration						-----	0.37**	0.28**
7. Threatening Behavior IPV Perpetration							-----	0.12**
8. Negative Urgency								-----
Female Mean	**5.36**	10.03	**7.83**	0.48	0.69	20.25	0.49	**2.35**
Female SD	**3.76**	5.58	**5.55**	2.69	2.55	28.01	2.16	**0.64**
Male Mean	**8.22**	9.73	**10.48**	0.52	0.41	17.20	0.48	**2.18**
Male SD	**4.31**	5.08	**5.97**	2.42	2.77	26.19	2.97	**0.60**

*p < 0.05, **p < 0.01
Note: Bolded text indicate significant differences between females and males.

32

Table 2.

Zero-Order Correlations for Study Variables in Females

	1	2	3	4	5	6	7	8
1. SAM-USE Scale	-----	0.41**	0.42**	0.26**	0.22**	0.21**	0.26**	0.15*
2. AUDIT		-----	0.13*	0.12*	0.16**	0.16**	0.13*	0.38**
3. CUDIT-R			-----	0.16**	0.10	0.19**	0.16**	0.09
4. Sexual IPV Perpetration				-----	0.45**	0.10	0.60**	0.12*
5. Physical IPV Perpetration					-----	0.43**	0.61**	0.12*
6. Verbal/Emotional IPV Perpetration						-----	0.30**	0.28**
7. Threatening Behavior IPV Perpetration							-----	0.12*
8. Negative Urgency								-----
Mean	5.36	10.03	7.83	0.48	0.69	20.25	0.49	2.35
SD	3.76	5.58	5.55	2.69	2.55	28.01	2.16	0.64

*p < 0.05, **p < 0.01

Table 3.

Zero-Order Correlations for Study Variables in Males

	1	2	3	4	5	6	7	8
1. SAM-USE Scale	-----	0.54**	0.48**	0.10	-0.08	0.14	0.08	0.18*
2. AUDIT		-----	0.18*	0.09	-0.03	0.05	0.03	0.18*
3. CUDIT-R			-----	0.20*	0.19*	0.28**	0.29**	0.24**
4. Sexual IPV Perpetration				-----	0.37**	0.26**	0.05	-0.06
5. Physical IPV Perpetration					-----	0.06	0.01	-0.01
6. Verbal/Emotional IPV Perpetration						-----	0.51**	0.29**
7. Threatening Behavior IPV Perpetration							-----	0.14
8. Negative Urgency								-----
Mean	8.22	9.73	10.48	0.52	0.41	17.20	0.48	2.18
SD	4.31	5.08	5.97	2.42	2.77	26.19	2.97	0.60

*p < 0.05, **p < 0.01

Table 4.

Multiple Group Model Analyses by Gender Predicting IPV Perpetration

Females	Sexual IPV Perpetration *B* (*SE*)	Physical IPV Perpetration *B* (*SE*)	Verbal/Emotional IPV Perpetration *B* (*SE*)	Threatening Behavior IPV Perpetration *B* (*SE*)
Independent Variables				
SAM Use	**0.10** (0.03)**	**0.13* (0.05)**	**0.06** (0.01)**	**0.10** (0.04)**
Alcohol Use	-0.01 (0.05)	0.01 (0.02)	-0.01 (0.01)	0.01 (0.02)
Marijuana Use	0.05 (0.03)	-0.06 (0.03)	0.01 (0.02)	0.02 (0.04)
Negative Urgency	-0.11 (0.54)	-0.02 (0.25)	**0.55** (0.08)**	0.30 (0.21)
Males	Sexual IPV Perpetration *B* (*SE*)	Physical IPV Perpetration *B* (*SE*)	Verbal/Emotional IPV Perpetration *B* (*SE*)	Threatening Behavior IPV Perpetration *B* (*SE*)
Independent Variables				
SAM Use	0.05 (0.10)	**-0.56** (0.11)**	0.02 (0.03)	**-0.18** (0.05)**
Alcohol Use	0.01 (0.03)	**0.62** (0.16)**	-0.02 (0.02)	**0.15** (0.04)**
Marijuana Use	**0.09* (0.04)**	**0.08** (0.02)**	0.03 (0.03)	**0.26** (0.03)**
Negative Urgency	**-1.36** (0.39)**	-0.82 (0.57)	**0.56** (0.18)**	**0.86* (0.41)**

Note: Bolded text represents significant effects.
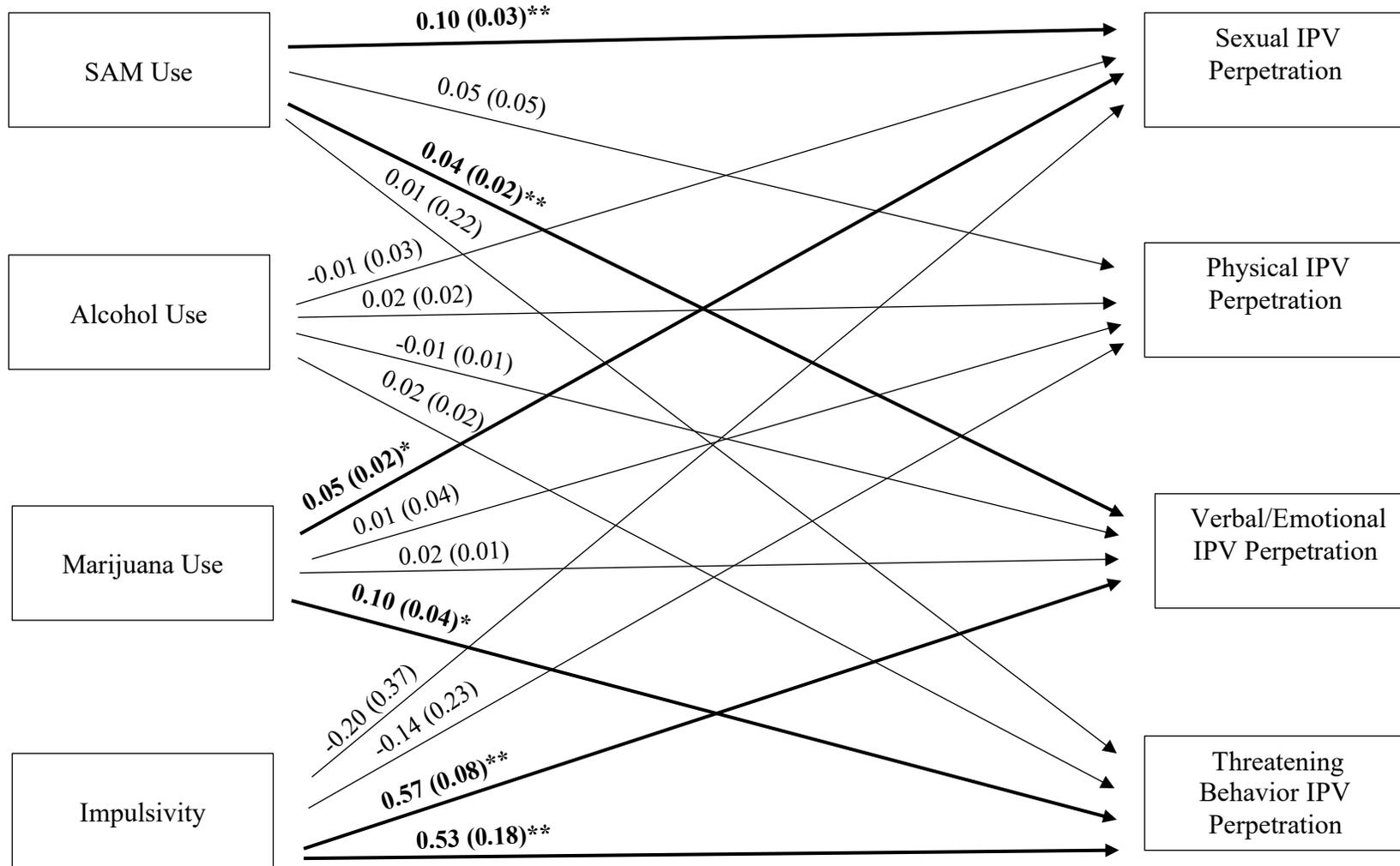*$p < 0.05$, **$p < 0.01$

35

Table 5.

Poisson Regression Analyses by Substance Use Quantity/Frequency and Substance Use-Related Problems Predicting IPV Perpetration

Substance Use Quantity/Frequency *Independent Variables*	Sexual IPV Perpetration *B* (*SE*)	Physical IPV Perpetration *B* (*SE*)	Verbal/Emotional IPV Perpetration *B* (*SE*)	Threatening Behavior IPV Perpetration *B* (*SE*)
SAM Use Quantity/Frequency	0.10 (0.06)	-0.02 (0.08)	**0.06* (0.02)**	0.04 (0.06)
Alcohol Use Quantity/Frequency	0.02 (0.09)	0.03 (0.05)	-0.02 (0.03)	-0.003 (0.08)
Marijuana Use Quantity/Frequency	0.11 (0.09)	0.01 (0.14)	0.03 (0.04)	0.23 (0.15)
Substance Use-Related Problems *Independent Variables*	Sexual IPV Perpetration *B* (*SE*)	Physical IPV Perpetration *B* (*SE*)	Verbal/Emotional IPV Perpetration *B* (*SE*)	Threatening Behavior IPV Perpetration *B* (*SE*)
SAM Use-Related Problems	**0.10* (0.05)**	**0.16* (0.07)**	0.02 (0.03)	-0.003 (0.06)
Alcohol Use-Related Problems	-0.003 (0.05)	-0.001 (0.03)	0.01 (0.02)	0.04 (0.03)
Marijuana Use-Related Problems	**0.10* (0.03)**	-0.001 (0.06)	**0.04* (0.02)**	**0.14* (0.04)**

Note: Bolded text represents significant effects.
*p < 0.05, **p < 0.01

Figure 2. Poisson regression results predicting IPV perpetration.
*p < 0.05, **p < 0.01
Note: Bolded lines represent significant relationships.

References

Adamson, S. J., Kay-Lambkin, F., Baker, A. L., Lewin, T. J., Thornton, L., Kelly, B. J., &
Sellman, J. D. (2010). An improved brief measure of cannabis misuse: The cannabis use
disorders identification test-revised (CUDIT-R). *Drug and Alcohol Dependence, 110*(1-
2), 137-143.

Birkley, E., & Eckhardt, C. I. (2015). Anger, hostility, and internalizing negative emotions, and
intimate partner violence perpetration: A meta-analytic review. *Clinical Psychology
Review, 37*, 40-56.

Bliton, C. F., Wolford-Clevenger, C., Zapor, H., Elmquist, J., Brem, M. J., Shorey, R. C., &
Stuart, G. L. (2016). Emotion dysregulation, gender, and intimate partner violence
perpetration: An exploratory study in college students. *Journal of Family Violence, 31*,
371-377.

Cafferky, B. M., Mendez, M., Anderson, J. R., & Stith, S. M. (2018). Substance use and intimate
partner violence: A meta-analytic review. *Psychology of Violence, 8*(1), 110-131.

Caldwell, J. E., Swan, S. C., & Woodbrown, V. D. (2011). Gender differences in intimate partner
violence outcomes. *Psychology of Violence, 2*(1), 42-57.

Cascardi, M., & Muzyczyn, B. (2016). Concordant responding on the physical assault/abuse
subscales of the Revised Conflict Tactics Scale 2 and Conflict in Adolescent Dating
Relationships Inventory. *Psychology of Violence, 6*(2), 303-312.

Chait L. D., & Perry J. L. (1994). Acute and residual effects of alcohol and marijuana, alone and
in combination, on mood and performance. *Psychopharmacology, 115*, 340–349.

Collins, L. M., Graham, J. W., Hansen, W. B., & Johnson, C. A. (1985). Agreement between

    retrospective accounts of substance use and earlier reported substance use. *Applied*

    Psychological Measurement, 9(3), 301-309.

Coskunpinar, A., Dir, A. L., & Cyders, M. A. (2013). Multidimensionality in impulsivity and

    alcohol use: A meta-analyses using the UPPS model of impulsivity. *Alcoholism: Clinical*

    and Experiemtnal Research, 37(9), 1441-1450.

Crane, C. A., Oberleitner, L. M. S., Devine, S., & Easton, C. J. (2014). Substance use disorders

    and intimate partner violence perpetration among male and female offenders. *Psychology of*

    Violence, *4*(3), 322–333.

Cunradi, C. B., Todd, M., & Mair, C. (2015). Discrepant Patterns of Heavy Drinking, Marijuana

    Use, and Smoking and Intimate Partner Violence. *Journal of Drug Education*, *45*(2), 73–95.

Cuttler, C., & Spradlin, A. (2017). Measuring cannabis consumption: Psychometric properties of

    the daily sessions, frequency, age of onset, and quantity of cannabis use inventory

    (DFAQ-CU). *PLoS ONE, 12*(5): e0178194.

Cyders, M. A., Smith, G. T., Spillane, N. S., Fischer, S., Annus, A. M., & Peterson, C. (2007).

    Integration of impulsivity and positive mood to predict risky behavior: Development and

    validation of a measure of positive urgency. *Psychological Assessment, 19,* 107–118.

Cyders, M. A. (2013). Impulsivity and the sexes: Measurement and structural invariance of the

    UPPS-P impulsive behavior scale. *Assessment, 20*(1), 86-97.

de Meneses-Gaya, C., Zuardi, A. W., Loureiro, S. R., & Crippa, J. A. S. (2009). Alcohol use

    disorders identification test (AUDIT): An updated systematic review of psychometric

    properties. *Psychology & Neuroscience, 2*(1), 83-97.

Derefinko, K., DeWall, C. N., Metze, A. V., Walsh, E. C., & Lynam, D. R. (2011). Do different

    facets of impulsivity predict different types of aggression? *Aggressive Behavior, 37*(3),

    223-233.

De Sousa Fernandes Perna, E. B., Theunissen, E. L., Kuypers, K. P. C., Toennes, S. W., &

    Ramaekers, J. G. (2016). Subjective aggression during alcohol and cannabis intoxication

    before and after aggression exposure. *Psychopharmacology, 233*(18), 3331-3340.

Eckhardt, C. I., Parrott, D. J., & Sprunger, J. G. (2015). Mechanisms of Alcohol-Facilitated

    Intimate Partner Violence. *Violence Against Women*, *21*(8), 939–957.

Exner-Cortens, D., Gill, L., & Eckenrode, J. (2016). Measurement of adolescent dating violence:

    A comprehensive review (Part 1, behaviors). *Agression and Violent Behavior, 27*, 64-78.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using

    G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods,*

    41(4), 1149-1160.

Foran, H. M., & O'Leary, K. D. (2008). Problem drinking, jealousy, and anger control: Variables

    predicting physical aggression against a partner. *Journal of Family Violence, 23*, 141-148.

Fried, P. A., Watkinson, B., & Gray, R. (2005). Neurocognitive consequences of marijuana--A

    comparison with pre-drug performance. *Neurotoxicology and Teratology, 27*(2), 231-239.

Gallagher, K. E., & Parrott, D. J. (2011). Does distraction reduce the alcohol–aggression

    relation? A cognitive and behavioral test of the attention-allocation model. *Journal of*

    Consulting and Clinical Psychology, 79(3), 319-329.

Giancola, P. R., Josephs, R. A., Parrott, D. J., & Duke, A. A. (2010). Alcohol myopia revisited:

    Clarifying aggression and other acts of disinhibition through a distorted lens. *Perspectives*

    on Psychological Science, *5*(3), 265–278.

Haas, A. L., Wickham, R., Macia, K., Shields, M., Macher, R., & Schulte, T. (2015). Identifying

    Classes of Conjoint Alcohol and Marijuana Use in Entering Freshmen. *Psychology of*

    Addictive Behaviors, *29*(3), 620–626.

Joe, H., & Zhu, R. (2005). Generalized Poisson distribution: The property of mixture of Poisson

    and comparison with negative binomial distribution. *Biometrical Journal, 47*, 219–229.

Johnson, R. M., Lavalley, M., Schneider, K. E., Musci, R. J., Pettoruto, K., & Rothman, E. F.

    (2017). Marijuana use and physical dating violence among adolescents and emerging adults:

    A systematic review and meta-analysis. *Drug and Alcohol Dependence*, *174*, 47–57.

Katz, J., Kuffel, S. W., & Coblentz, A. (2002). Are there gender differences in sustaining dating

    violence?: An examination of frequency, severity, and relationship satisfaction. *Journal*

    of Family Violence, 17(3), 247-271.

Kinsfogel, K. M., & Grych, J. H. (2004). Interparental conflict and adolescent dating

    relationships: Integrating cognitive, emotional, and peer influences. *Journal of Family*

    Psychology, 18(3), 505-515.

Kolp, H., Horvath, S., Metrik, J., Lisdahl, K., Stuart, G. L., & Shorey, R. C. (2019). *Development*

    of the Simultaneous Alcohol and Marijuana Use (SAM-USE) Scale. Poster to be

    presented at the annual convention of the Research Society on Alcoholism, Minneapolis,

    MN.

Lee, C. M., Cadigan, J. M., & Patrick, M. E. (2017). Differences in reporting of perceived acute

    effects of alcohol use, marijuana use, and simultaneous alcohol and marijuana use. *Drug*

    and Alcohol Dependence, 180, 391-394.

Leonard, K. E. (2005). Alcohol and intimate partner violence: when can we say that heavy

    drinking is a contributing cause of violence? *Addiction*, *100*(4), 422-425.

Leonard, K. E., & Quigley, B. M. (2017). Thirty years of research show alcohol to be a cause of

    intimate partner violence: future research needs to identify who to treat and how to treat

    them. *Drug and alcohol review*, *36*(1), 7-9.

Li, Y., Zhang, W., Liu, J., Arbeit, M. R., Schwartz, S. J., Bowers, E. P., & Lerner, R. M. (2011).

    The role of school engagement in preventing adolescent delinquency and substance use:

    A survival analysis. *Journal of Adolescence*, *34*(6), 1181-1192.

Low, S., Tiberio, S. S., Shortt, J. W., Capaldi, D. M., Eddy, J. M., & Denny, T. (2017).

    Associations of couples' intimate partner violence in young adulthood and substance use: A

    dyadic approach. *Psychology of Violence*, *7*(1), 120–127.

Lundin, A., Hallgren, M., Balliu, N., & Forsell, Y. (2015). The use of alcohol use disorders

    identification test (AUDIT) in detecting alcohol use disorder and risk drinking in the

    general population: Validation of AUDIT using schedules for clinical assessment in

    neuropsychiatry. *Alcoholism: Clinical and Experimental Research, 39*(1), 158-165.

Mathias, C. W., Blumenthal, T. D., Dawes, M. A., Liguori, A., Richard, D. M., Bray, B., . . .

    Dougherty, D. M. (2011). Failure to sustain prepulse inhibition in adolescent marijuana

    users. *Drug and Alcohol Dependence, 116*(1-3), 110-116.

McDonald, J., Schleifer, L., Richards, J. B., & de Wit, H. (2003). Effects of THC on behavioral

    measures of impulsivity in humans. *Neuropsychopharmacology, 28*(7), 1356-1365.

Metrik, J., Kahler, C. W., McGeary, J. E., Monti, P. M., & Rohsenow, D. J. (2011). Acute effects

    of marijuana smoking on negative and positive affect. *Journal of Cognitive*

    Psychotherapy, 25(1), 31-46.

Moore, T. M., Elkins, S. R., Mcnulty, J. K., Kivisto, A. J., & Handsel, V. A. (2011). Alcohol use

    and intimate partner violence perpetration among college students: Assessing the temporal

association using electronic diary technology. *Psychology of Violence, 1*(4), 315-328.

Moore, T. M., & Stuart, G. L. (2005). A review of the literature on marijuana and interpersonal violence. *Aggression and Violent Behavior, 10*, 171-192.

Moore, T. M., Stuart, G. L., Meehan, J. C., Rhatigan, D. L., Hellmuth, J. C., & Keen, S. M. (2008). Drug abuse and aggression between initmate partners: A meta-analytic review. *Clinical Psychology Review, 28*, 248-275.

Muthén, B. & Muthén, L. K. (2006). Integrating person-centered and variable-centered analyses: Growth mixture modeling with latent trajectory classes. *Alcoholism: Clinical and Experimental Research, 24*(6), 882-891.

Nabors, E. L. (2010). Drug use and intimate partner violence among college students: An in-depth exploration. *Journal of Interpersonal Violence*, *25*(6), 1043–1063.

O'Brien, R. M. (2007). A cautin regarding rules of thumb for variance inflation factors. *Quality and Quantity, 41*(5), 673-690.

O'Hare, T., & Sherrer, M. V. (1999). Validating the alcohol use disorder identification test with college first-offenders. *Journal of Substance Abuse Treatment, 17*(1-2), 113-119.

Patrick, Megan E, Fairlie, Anne M, Lee, C. M. (2018). Motives for simultaneous alcohol and marijuana use among young adults. *Addictive Behaviors*, *76*, 363–369.

Peters, E. N., Leeman, R. F., Fucito, L. M., Toll, B. A., Corbin, W. R., & O'Malley, S. S. (2012). Co-occurring marijuana use is associated with medication nonadherence and nonplanning impulsivity in young adult heavy drinkers. *Addictive Behaviors*, *37*(4), 420–426.

Peters, J. R., Derefinko, K. J., & Lynam, D. R. (2017). Negative urgency accounts for the association between borderline personality features and intimate partner violence in young men. *Journal of Personality Disorders, 31*(1), 16-25.

Petit, G., Luminet, O., Maurage, F., Tecco, J., Lechantre, S., Ferauge, M., Gross, J. J., & Timary, P. (2015). Emotion regulation in alcohol dependence. *Alcoholism: Clinical and Experimental Research, 39*(12), 2471-2479.

Próspero, M. (2007). Mental health symptoms among male victims of partner violence. *American Journal of Men's Health, 1*(4), 269-277.

Reinert, D. F., & Allen, J. P. (2002). The alcohol use disorders identification test (AUDIT): A review of recent research. *Alcoholism: Clinical and Experimental Research, 26*(2), 272-279.

Reingle, J. M., Staras, S. A. S., Jennings, W. G., Branchini, J., & Maldonado-Molina, M. M. (2012). The relationship between marijuana use and intimate partner violence in a nationally representative, longitudinal sample. *Journal of Interpersonal Violence, 27*(8), 1562-1578.

Romito, P., & Grassi, M. (2007). Does violence affect one gender more than the other? the mental health impact of violence among male and female university students. *Social Science & Medicine, 65*(6), 1222-1234.

Saunders, J. B., Aasland, O. G., Babor, T. F., Fuente, J. R., & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption — II. *Addiction, 88,* 791–804.

Shillington, A. M., Reed, M. B., Clapp, J. D., & Woodruff, S. I. (2011). Testing the length of time theory of recall decay: Examining substance use report stability with 10 years of National Longitudinal Survey of Youth data. *Substance Use and Misuse, 46*(9), 1105-1112.

Shorey, R. C., Stuart, G. L., & Cornelius, T. L. (2011). Dating violence and substance use in

   college students: A review of the literature. *Aggression and Violent Behavior*, *16*, 541–550.

Shorey, R. C., Sherman, A. E., Kivisto, A. J., Elkins, S. R., Rhatigan, D. L., & Moore, T. M.

   (2011). Gender differences in depression and anxiety among victims of intimate partner

   violence: The moderating effect of shame proneness. *Journal of Interpersonal*

   Violence, 26(9), 1834-1850.

Shorey, R. C., Brasfield, H., Febres, J., Cornelius, T. L., & Stuart, G. L. (2012). A comparison of

   three different scoring methods for self-report measures of psychological aggression in a

   sample of college females. *Violence and Victims, 27*(6), 973-990.

Shorey, R. C., Stuart, G. L., Mcnulty, J. K., & Moore, T. M. (2014a). Acute alcohol use

   temporally increases the odds of male perpetrated dating violence: A 90-day diary analysis.

   Addictive Behaviors, *39*, 365–368.

Shorey, R. C., Stuart, G. L., Moore, T. M., & Mcnulty, J. K. (2014b). The temporal relationship

   between alcohol, marijuana, angry affect, and dating violence perpetration: A daily diary

   study with female college students. *Psychology of Addictive Behaviors*, *28*(2), 516–523.

Shorey, R. C., Haynes, E., Brem, M., Florimbio, R., Grigorian, H., & Stuart, G. L. (2018).

   Marijuana use is associated with intimate partner violence perpetration among men arrested

   for domestic violence. *Translational Issues in Psychological Science*, *4*(1), 108–118.

Shorey, R. C., Allan, N. P., Cohen, J. R., Fite, P. J., Stuart, G. L., & Temple, J. R. (2019).

   Testing the factor structure and measurement invariance of the conflict in Adolescent

   Dating Relationship Inventory. Psychological assessment, 31(3), 410-416.

Skosnik, P. D., Spatz-Glenn, L., & Park, S. (2001). Cannabis use is associated with schizotypy

   and attentional disinhibition. *Schizophrenia Research, 48*(1), 83-92.

Smith, G. T., Fischer, S., Cyders, M. A., Annus, A. M., Spillane, N. S., & McCarthy, D. M. (2007). On the validity of discriminating among impulsivity-like traits. *Assessment, 14*, 155-170.

Smith, P. H., Homish, G. G., Collins, R. L., Giovino, G. A., White, H. R., & Leonard, K. E. (2014). Couples' marijuana use is inversely related to their intimate partner violence over the first 9 years of marriage. *Psychology of Addictive Behaviors*, *28*(3), 734–742.

Smith, P. H., Homish, G. G., Leonard, K. E., & Cornelius, J. R. (2011). Intimate partner violence and specific substance use disorders: Findings from the national epidemiologic survey on alcohol and related conditions. *Psychology of Addictive Behaviors*, *26*(2), 236–245.

Steele, C., & Josephs, R. (1990). Alcohol myopia: Its prized and dangerous effects. *American Psychologist, 45*, 921–933

Stith, S. M., Smith, D. B., Penn, C. E., Ward, D. B., & Tritt, D. (2004). Intimate partner physical abuse perpetration and victimization risk factors: A meta-analytic review. *Aggression and Violent Behavior, 10*(1), 65-98.

Straus, M. A. (2004). Prevalence of violence against dating partners by male and female university students worldwide. *Violence Against Women, 10*(7), 790-811.

Straus, M. A., & Gozjolko, K. L. (2014). "Intimate terrorism" and gender differences in injury of dating partners by male and female university students. *Journal of Family Violence, 29*(1), 51-65.

Straus, M. A., Hamby, S. L., Boney-McCoy, S., & Sugarman, D. B. (1996). The revised conflict tactics scales (CTS2): Development and preliminary psychometric data. *Journal of Family Issues, 17*(3), 283-316.

Stuart, G. L., Moore, T. M., Elkins, S. R., O'Farrell, T. J., Temple, J. R., Ramsey, S. E., &

    Shorey, R.C. (2013). The temporal association between substance use and intimate

    partner violence among women arrested for domestic violence. *Journal of Consulting and*

    Clinical Psychology, 81(4), 681-690.

Subbaraman, M. S., & Kerr, W. C. (2015). Simultaneous versus concurrent use of alcohol and

    cannabis in the national alcohol survey. *Alcoholism: Clinical and Experimental Research*,

    39(5), 872–879.

Swan, S. C., Gambone, L. J., Caldwell, J. E., Sullivan, T. P., & Snow, D. L. (2008). A review of

    research on women's use of violence with male intimate partners. *Violence and*

    victims, *23*(3), 301–314.

Terry-McElrath, Y. M., O'Malley, P. M., & Johnston, L. D. (2009). Reasons for drug use among

    American youth by consumption level, gender, and race/ethnicity: 1976-2005. *Journal of*

    Drug Issues, 39(3), 677-714.

Temple, J. R., Shorey, R. C., Fite, P., Stuart, G. L., & Le, V. D. (2013). Substance use as a

    longitudinal predictor of the perpetration of teen dating violence. *Journal of Youth and*

    Adolescence, 42(4), 596-606.

Testa, M., & Brown, W. C. (2015). Does marijuana use contribute to intimate partner

    aggression? A brief review and directions for future research. *Current Opinion in*

    Psychology, 5, 6-12.

Testa, M., & Derrick, J. (2014). A daily process examination of the temporal association between

    alcohol use and verbal and physical aggression in community couples. *Psychology of*

    Addictive Behaviors, 28(1), 127-138.

Testa, M., Wang, W., Derrick, J., & Leonard, K. E. (2018). Marijuana use by intimate partners:

    Does discrepant use impair relationship functioning? *Psychology of Addictive Behaviors.*

    Advance online publication.

Weafer, J., & Fillmore, M. T. (2015). Alcohol-related cues potentiate alcohol impairment of

    behavioral control in drinkers. *Psychology of Addictive Behaviors, 29*(2), 290-299.

Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a

    structural model of personality to understand impulsivity. *Personality and Individual*

    Differences, 30, 669–689.

Wolfe, D. A., Scott, K., Reitzel-Jaffe, D., Wekerle, C., Grasley, C., & Straatman, A. (2001).

    Development and validation of the Conflict in Adolescent Dating Relationships

    Inventory. *Psychological Assessment, 13*(2), 277-293.

Wolford-Clevenger, C., Vann, N. C., & Smith, P. N. (2016). The association of partner abuse

    types and suicidal ideation among men and women college students. *Violence and*

    Victims, 31(3), 471-485.