

**CANNABIS USE AND PERPETRATION OF INTIMATE PARTNER VIOLENCE:  
TESTING A SPURIOUS EFFECTS MODEL**

by

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## **Abstract**

This thesis examined the plausibility of a spurious effects model of the cannabis and intimate partner violence relationship in undergraduate students (Study 1), inpatients in a residential addictions treatment facility (Study 2), and discharged civil psychiatric patients (Study 3). The primary aim of the studies was to examine the cannabis-IPV association while accounting for problematic alcohol use and psychopathic personality traits. Using bootstrap procedures, the studies examined the independent association of cannabis with perpetration of physical assault and psychological aggression, accounting for problematic alcohol use and psychopathic personality. In general, across three studies, the results do not support a direct association between cannabis and perpetration of aggression against an intimate partner. Across all three studies, frequency of cannabis use was not related to perpetration of intimate partner violence. In Study 1, cannabis evinced a trend to be associated with perpetration of IPV; however this association was accounted by both problematic alcohol use and by psychopathic personality traits. In Study 2 and Study 3, cannabis demonstrated no univariate association or even a trend with perpetration of IPV, and no association when accounting for alcohol use and psychopathy, and spurious effects could not be investigated. Overall, the findings suggest potential partial support for the existence of a spurious-effects conceptualization of the relationship between cannabis and perpetration of IPV, and suggest further research is required to characterize the relationship in a variety of populations.

## **Preface**

**A portion of this thesis was presented at the 24<sup>th</sup> Annual Symposium of the International Cannabinoid Research Society:**

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## Chapter 1 Introduction

Intimate partner violence (IPV) is a substantial public health and social concern. IPV is a cluster of behaviours that result in physical, psychological, or sexual harm to an individual at the hands of a married, cohabiting, dating, or sexually intimate partner (Centers for Disease Control and Prevention, 2015). Physical harm may include, but is not limited to, punching, slapping, hitting, biting, choking, shoving, and use of a weapon. Psychological harm includes verbal and nonverbal behaviours with the intent to cause emotional distress or to control another person. Such behaviours might include name-calling, insulting, shouting, yelling, and threatening violence. In 2010, there were a reported 102,500 victims of IPV in Canada, and the risk of experiencing violence at the hands of a significant other was higher than experiencing stranger or other family violence (Sinha, 2012). Victims of IPV are at an increased risk for poor general health, depression, problematic substance use, chronic disease and mental illness, as well as physical injury (Coker et al., 2001). Moreover, IPV places substantial strain on the economy, with a reported cost to Canadians of approximately \$7.4 billion a year (Zhang, Hoddenbagh, McDonald, & Scrim, 2009). Given the physical, mental, social, and economic costs of such aggression, research examining risk factors associated with IPV is warranted.

One prominent risk factor identified for perpetration of IPV is licit and illicit substance use. Research indicates a robust association between drug and alcohol use, and IPV (Foran & O'Leary, 2008; Moore et al., 2008). A recent meta-analytic review demonstrates small to moderate effects sizes for the relationship between alcohol and male-to-female perpetration, as well as female-to-male perpetration (Foran & O'Leary, 2008). Illicit substances have also been identified as associated with IPV, and small to moderate

effect sizes have been noted for cocaine and marijuana in relation to IPV perpetration (Moore et al., 2008). Moreover, research conducted with substance abuse treatment samples has demonstrated that treatment for substance abuse is associated with a decrease in IPV perpetration (see Stuart, O'Farrell, & Temple, 2009). Ultimately, the research suggests that a greater involvement with psychoactive substances such as alcohol and cannabis is associated with perpetration of IPV.

### **1.1 Substance Use and IPV**

The link between substance use and IPV has long been recognized as a substantial social concern. Indeed, the temperance movement in early 19<sup>th</sup> century America campaigned for the prohibition of alcohol, and supporters considered it to be dangerous, immoral, and the primary cause of nearly all social problems, including violence against women and children (Levine & Renairman, 1991).

Three prominent theories exist on the relationship between substance use and IPV: the proximal effects model, indirect effects model, and the spurious effects model, (Leonard & Quigley, 1999; Foran & O'Leary, 2008). The proximal effects model suggests that substance use is causally related to violence and aggression, and acute intoxication is responsible for perpetration of IPV through direct pharmacological effects on cognitive functioning, which leads to increased likelihood of aggression. The indirect effects model posits that chronic and prolonged substance use has a detrimental effect on relationship quality, thereby increasing the likelihood of intimate partner aggression. For example, sustained substance use by one or both partners may lead to dissatisfaction in the relationship, which may increase partner aggression. The spurious effects model posits that the relationship between substance use and violence is the result of a shared variable. For

example, the *general deviance theory* posits that individuals involved in one form of deviant behaviour are likely to be involved in other forms as well (Harrison, Erickson, Adlaf, & Freeman, 2001). As such, the link between substance use and violence may be specious, and accounted for by a common variable such as general antisociality and psychopathic personality traits.

## **1.2 Alcohol and IPV**

Three meta-analytic studies have identified an association between alcohol use and perpetration of IPV (Ferrer, Bosch, Garcia, Manassero, & Gili, 2004; Foran & O'Leary, 2008; Stith, Smith, Penn, Ward, & Tritt, 2004). Results from a recent meta-analysis suggest that this association is small-moderate for males ( $d = .23$ ), and small for women ( $d = .14$ ) (Foran & O'Leary, 2008). Findings from a recent epidemiological study indicate that 21.7% of IPV perpetrators meet the criteria for an alcohol use disorder (AUD), compared to 9.7% of non-perpetrators (Smith, Homish, Leonard, & Cornelius, 2012).

The proximal effects model of alcohol use and IPV suggests that acute alcohol intoxication has a causal effect on violence and aggressive behavior due to its psychopharmacological effects. Indeed, acute intoxication can impair executive functioning in the frontal lobes resulting in overreaction to perceived threats and to a disinhibition of aggressive behaviours (see Pihl & Hoaken 2002). Daily diary studies report that the odds of perpetrating physical and psychological aggression are higher on drinking days than non-drinking days in male and female college students (Moore, Elkins, McNulty, Kivisto, & Handsel, 2011; Shorey, Stuart, McNulty, & Moore, 2013; Shorey, Stuart, McNulty, & Moore, 2014). Among alcohol treatment samples, alcohol consumption significantly increases the odds of same-day episodes of perpetration of physical IPV among males and

females (Stuart et al., 2009). This pattern of temporal association holds for analysis of partner dyads, such that the likelihood of perpetrating physical and psychological aggression is higher when alcohol has been consumed in the past four hours (Testa & Derrick, 2014). Taken together, the findings indicate strong evidence for the direct proximal effects of alcohol on the perpetration of intimate partner aggression.

Experimental studies bolster the findings obtained in survey and cross-sectional research. Non-human studies suggest that low to moderate doses of alcohol elicit aggressive responding in rodents and primates, while high doses typically result in sedation and a lack of aggression (Miczek, DeBold, Haney, Tidey, Vivian, & Weerts, 1994; Miczek, Fish, & DeBold, 2003; Miczek, Weerts, & DeBold, 1993). Findings from human research adhere to a similar pattern. Meta-analyses of experimental studies of the alcohol-aggression relationship indicate that acute alcohol intoxication is strongly associated with elicited aggression (Bushman, 1993; Bushman & Cooper, 1990; Hull & Bond, 1986; Ito, Miller, & Pollock, 1996; Steele & Southwick, 1985). Combined, the findings provide substantial support for the role of alcohol in aggressive behavior, and suggest that alcohol may play a larger role in the perpetration of IPV. Of the three substance use-violence models proposed, the strongest support is for the proximal effects model (Klosterman & Fals-Stewart, 2006).

Although there is substantial support for the relationship between alcohol consumption and aggression, it is yet unclear how individual differences contribute to this effect. Indeed, there are a number of potential “third variables” that could conceivably account for the variance between alcohol use and IPV and aggression, and potentially account for the relationship. In particular, psychopathic personality traits could be primarily responsible for the relationship between alcohol and perpetration of IPV (Foran & O’Leary,

2008; Osgood, Johnston, O'Malley, & Backman, 1988). Specifically, the multiple threshold model (Fals-Stewart, Leonard, & Birchler, 2005) suggests that individuals with high levels of antisocial personality characteristics have a tendency to be violent and aggressive regardless of alcohol intoxication, and also tend to be more involved in deviant behaviours such as excessive drinking. For antisocial individuals, the role of alcohol serves to lower aggressive inhibitions, making violence more likely. Moreover, Hines & Strauss (2007) found that antisocial personality disorder fully accounts for the relationship between binge drinking and perpetration of physical aggression in college students. However, research has generally found a persistent relationship between IPV and alcohol abuse after controlling for potential third variables. For example, among males and females arrested for domestic violence, alcohol use maintained a significant and direct association with perpetration of IPV after controlling for perpetrator antisociality, anger, and relationship discord (Stuart et al., 2006).

The indirect effects model posits that excessive alcohol use degrades relationship quality over time, thus leading to an increase in IPV perpetration. Ultimately, long-term alcohol use creates an environment in which acts of partner aggression are more likely to occur. However, after controlling for marital satisfaction and relationship controlled, the association between alcohol and partner violence remains strong (Fals-Stewart., 2005; McKenry, Julian, & Gavazzi, 1995), suggesting that alcohol may have a more direct relationship with perpetration of IPV.

In sum, the theories on the relationship between alcohol and perpetration of IPV have varying degrees of evidence, and they are not necessarily mutually exclusive explanations. However, the extant literature suggests relatively greater evidence for the proximal effects model, over the indirect and spurious effects model (Klosterman & Fals-Stewart, 2006).

### **1.3 Cannabis and IPV**

Cannabis is the most widely used illicit substance in Canada (Adlaf, Begin, & Sawka, 2005), and has been connected with aggression and violence in intimate partner relationships (Moore & Stuart, 2005). Meta-analytic findings on the nature of drug abuse and perpetration of intimate partner aggression indicate that cannabis use is associated with the perpetration of psychological and physical aggression (Moore et al., 2008). However, there are significant limitations with the current available studies on the nature of the cannabis-violence relationship. For example, many studies have examined only consumption as either a dichotomous yes/no variable or through frequency of use, and have not incorporated other aspects of use such as cannabis dependence, and other potentially important third variables such as antisocial/psychopathic personality characteristics and comorbid alcohol use (Shorey, Stuart, & Cornelius, 2011).

With respect to general violence, frequency of cannabis use is not associated with violence after controlling for aggressive personality, impulsivity/risk-taking, and disrespect for the law (MacDonald, Erickson, Wells, Hathaway, & Pakula, 2008), lending some support to the spurious effects model. Among young adults aged 11-20, frequent cannabis use is predictive of violent behaviour, particular during midadolescence (Wei, Loeber, & White, 2004). However, the authors note that this association is likely due to shared common risk factors, such as race/ethnicity and hard drug use, and antisociality was not evaluated as a potential covariate. In contrast, however, alcohol-violence remained significant when controlling for cannabis use.

Findings on the relationship between cannabis use disorders (CUDs) and perpetration of IPV are equivocal. Among offenders, noncomorbid CUDs are not associated with

increased likelihood of perpetrating IPV (Crane, Oberleitner, Devine, & Easton, 2014). However, CUDs paired with comorbid AUDs are associated with perpetration. In another study, CUDs are significantly associated with perpetration of IPV; however this association becomes nonsignificant when controlling for simultaneous victimization (Smith et al., 2012). Moreover, cannabis use was associated with increased perpetration in women, and decreased perpetration in men. In another study, after adjusting for confounds the association between CUDs and perpetration fails to retain significance. (Afifi, Henriksen, Asmundson, & Sareen, 2012). Among a treatment sample, comorbid AUD and CUD is associated with IPV perpetration for males, but not for females (Kraanen, Vedel, Scholing, & Emmelkamp, 2014). Cannabis use was associated with perpetration of physical violence and psychological aggression (e.g., yelling/insulting) in a large epidemiological study (Stalans & Richie, 2008). Ultimately, research suggests that there is a small, yet significant association between IPV perpetration and cannabis use, and the exploration of this link is warranted.

Longitudinal and laboratory findings have failed to provide support for the proximal model for the cannabis-violence relationship. Laboratory studies on the nature of THC and aggression have produced mixed findings in humans. Some suggest that administration of THC increases aggressive responding following provocation (Cherek et al., 1993; Myerscough & Taylor, 1985). However, other studies indicate that there are no significant effects of THC on aggression (Taylor et al., 1976), or that THC intoxication may actually decrease aggressive responding (Cherek & Dougherty, 1995). Moreover, animal models have failed to find an independent association between THC and aggression (Hoaken & Stewart, 2003). In a longitudinal study of adolescents utilizing a multilevel model framework, researchers reported no time-varying effect of cannabis use on perpetration of

dating aggression. In a similar vein, daily cannabis use is not associated with perpetration of IPV (Epstein-Ngo et al., 2013; Fals-Stewart, Golden, & Schumacher, 2003). Taken together, these findings suggest mixed or no evidence for a direct pharmacological effect of cannabis on the perpetration of IPV.

Increasing evidence suggests that the cannabis-aggression relationship may only manifest itself while a subject is in withdrawal (Hoaken & Stuart, 2003; Moore & Stuart, 2005). Withdrawal from cannabis is characterized by increased anxiety, anger, irritability, restlessness, and sleep difficulties, with an onset of 1-2 days after cessation of use, with a peak at approximately 2-6 days (Budney, Hughes, Moore, & Vandrey, 2004). Laboratory findings suggest that chronic, long-term cannabis users are significantly more aggressive during a period of abstinence than controls, and than their own pre-abstinence (Kouri, Pope, & Lukas, 1999). However, results from a recent study suggest that cannabis withdrawal is associated with partner aggression only for those who have a history of aggression (Smith, Homish, Leonard, & Collins, 2013). Ultimately, the findings suggest that potential third variables may be responsible for the link between cannabis use and aggression and not due to cannabis use *per se*. This has potentially important implications for understanding the cannabis-IPV relationship. Namely, that the association between cannabis use and perpetration of IPV is not due to acute intoxication or withdrawal symptoms, but rather long-standing patterns of antisocial behavior and psychopathic personality characteristics.

Increased frequency of cannabis use has been link with lower levels of relationships satisfaction (Fergusson & Boden, 2008; Lev-Ran et al., 2012), suggesting the plausibility of the indirect effects model. Relationship discord/dissatisfaction has been to shown to have a small to moderate association with perpetration of physical violence toward a partner (Stith

et al., 2004; Stith, Green, Smith, & Ward, 2008). Cannabis use is associated with increased verbal aggression in intimate relationships, and this in turn mediates the association between cannabis and physical violence (Stalans & Richie, 2008). However, research has generally failed to account for other factors strongly associated with cannabis use and IPV, including antisocial personality characteristics.

Antisociality, and in particular, psychopathic personality traits, are strongly associated with both IPV and with cannabis use (Walsh, Allen, & Kosson, 2007), suggesting that psychopathic personality characteristics may potentially alter the strength of cannabis-violence relationship when they are accounted for. This is consistent with spurious effects models of the relationship between drug use and aggression (Moore & Stuart, 2005). However, a paucity of studies have included antisociality psychopathic personality in the specific examination of the cannabis-IPV relationship. Stuart and colleauges (2008) conducted an extensive analysis of IPV and substance use among men and women in court-ordered violence interventions programs. They found a significant association between cannabis use and perpetration of physical IPV in men in a model that included antisociality, alcohol problems, trait anger, and relationship discord. This relationship was not found for female participants. However, the authours suggest that the findings may not generalize to the broader community, and replication is required with community samples. Among men presenting for treatment for substance use, cannabis use has no influence on perpetration of IPV when accounting for antisociality and other substance use (Mattson, O'Farrell, Lofgreen, Cunningham, & Murphy, 2012). As of 2014, few studies have directly examined the spurious effects/deviance model of the cannabis-violence relationship, despite the strong theoretical support for the model (Moore & Stuart, 2005). Recent longitudinal evidence suggests that

frequency of cannabis use may be inversely associated with perpetration of IPV. A nine year study examining a community sample of couples reported that after controlling for important covariates (e.g., alcohol use, antisociality), frequency cannabis use was associated with less frequent IPV perpetration for both men and women (Smith et al., 2014).

In sum, it appears that the cannabis-violence relationship may be fundamentally different from that of the alcohol-violence relationship in situations of IPV. Specifically, there appears to be a lack of research on the plausibility of the spurious effects model of cannabis use and IPV. Indeed, the association between cannabis use and perpetration of IPV may be due to variance shared with alcohol use and/or antisociality. The purpose of this thesis is to examine the link between cannabis use and perpetration of IPV in conjunction with, and accounting for alcohol use and antisocial personality characteristics. Moreover, this thesis aims to examine this association in three distinct samples: undergraduate students, in-patients at a residential addiction treatment facility, and discharged civil psychiatric patients. The inclusion of three unique samples serves to expand generalizability of findings (Stuart et al., 2008).

#### **1.4 Research Hypotheses**

The stated aims of the research program are to examine the association between cannabis and perpetration of IPV. Specifically, the studies examined plausibility of the spurious effects model of the cannabis-IPV relationship, insofar as the association is accounted for by two potential third variables: problematic alcohol use and psychopathic personality. This series of studies were driven by three hypotheses:

**Hypothesis 1:** Frequency of cannabis use is positively associated with perpetration of IPV.

**Hypothesis 2:** Frequency of cannabis use is positively associated with increased alcohol use and problematic alcohol use, as well as positively associated with psychopathic personality.

**Hypothesis 3:** The association between cannabis use and perpetuation of IPV will be reduced by inclusion of alcohol use and psychopathic personality characteristics.

## Chapter 2 Study One

### 2.1 Participants

Participants in study one were undergraduate students attending the University of British Columbia (UBC), Okanagan campus. Students participated in a large online study entitled “Intimate Relationships and Personality”, a large self-report survey investigating IPV Typologies in undergraduate students. Students were recruited using the online UBC Sona research system. The larger survey included detailed questions on personality, mental health, social support, substance use, and victimization. The survey took approximately 90 minutes to complete, and students were awarded 1.5 course credits for their participation. The measures selected for this study were a smaller subset of the larger study. To be eligible to complete the study, participants must have been in a dating, marital, or cohabiting relationship in the past year. A total of N=1057 completed surveys were collected for study one of this thesis. The participants ranged in age from 17 to 50 (M= 19.83, SD = 2.77), and of those that indicated gender, the majority were female (63.3%).

### 2.2 Measures

#### *Intimate Partner Violence:*

IPV perpetration was assessed using the Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). The CTS2 is a 39-item questionnaire designed to measure the extent to which romantic partners engage in psychological and physical aggression, and the use of more prosocial negotiation tactics to deal with conflicts. The CTS2 contains five subscales: physical aggression, psychological aggression, sexual coercion, injury, and negotiation. Respondents are asked to indicate the frequency of a particular behaviour within the past year, with response options ranging from 0 (*has never*

*happened*) to 6 (*more than 20 times in the past year*). There is an additional response category that may be selected to indicate that the behaviour has not occurred in the past year, but has happened at least once in the respondent's relationship/lifetime. Each item is answered twice: once for the behaviour of the respondent, and once for the behaviour of the respondent's partner. IPV was conceptualized as two dichotomous (i.e., yes or no) variables, one for perpetration of physical assault and another for psychological aggression to a partner in the past year.

#### *Alcohol Use*

The Alcohol Use Disorders Identification Test (Saunders, Aasland, Babor, de la Fuente & Grant, 1993) is a 10-item measure designed to identify problematic levels of alcohol use, and screen for alcohol abuse and dependence. Of the 10 items, 8 are rated on a 5-point scale that queries the frequency of alcohol use behaviors and feelings (e.g. 0= never to 4 = daily), and 2 items are rated on a similarly constituted 3-point scale. The items mirror the diagnostic criteria for alcohol dependence as conceptualized by the World Health Organization. The scale ranges from 0-40, with higher scores indicating more problematic alcohol use.

#### *Cannabis Use*

Frequency of cannabis use was measured using the Cannabis Use Disorders Identification Test (Adamson & Sellman, 2003). The CUDIT is a derivative of the Alcohol Use Disorders Identification Test that mirrors the parent measure, but refers to cannabis rather than alcohol in the queries. Frequency of use was measured with the question "How often do you use cannabis?" Respondents answered on a Likert-style scale, with responses ranging from 0 (*never*) to 4 (*four or more times a week*). Approximately 24% of respondents

indicated they never used cannabis, and of those who had used cannabis in the past 6 months, the majority used once a month or less (42%).

*Psychopathic Personality Characteristics:*

Psychopathic personality was assessed with the Self-Report Psychopathy Scale-III (SRP-III; Williams, Paulhus, & Hare, 2007). The SRP-III is a 64 item that yields a global psychopathy scale, as well as scores for four subscales: Callous Affect, Interpersonal Manipulation, Erratic Lifestyle, and Anti-Social Behaviour. Respondents are asked to report on a 5 point Likert scale the extent to which they agree with each statement, from 1 (*disagree strongly*) to 5 (*agree strongly*). The SRP four factor model aligns well with the four facet model of psychopathy captured by the Psychopathy Checklist Revised (Hare, 1991, 2003), generally considered to be the gold standard for assessing psychopathic personality. Moreover, research suggests that it can adequately capture the construct in a variety of individuals (Neal & Sellbom, 2012)

### **2.3 Analytic Plan**

Linear and binary logistic regression was used to model the associations between cannabis use, problematic alcohol use, psychopathic personality, and perpetration physical and psychological IPV. First, bivariate correlations were used to examine associations among frequency of cannabis use, alcohol use, and psychopathic personality. Next, binary logistic regression was used to assess the relationship between frequency of cannabis use and IPV perpetrator/non-perpetrator status. Psychopathic personality traits and problematic alcohol use were then added to the model as a secondary predictors to determine if cannabis use remained a significant independent predictor of perpetration status. All analyses were conducted using bootstrapping techniques with 1000 resamples, which allowed for the

creation of bootstrapped 95% confidence intervals (CIs). Correlational effects were considered significant if the 95% CI did not contain zero; odds ratios were considered statistically significant if they did not contain one.

## **2.4 Results**

### *Physical Aggression*

Descriptive statistics are presented in Table 1. Approximately 33% (N = 345) of the sample indicated past year perpetration of at least one act of physical aggression. Frequency of cannabis use was positively associated with problematic alcohol use ( $r = .32$ , 95% CI = .26-.38), and with psychopathic personality ( $r = .29$ , 95% CI = .24-.35); alcohol use was positively associated with psychopathic personality ( $r = .35$ , 95% CI = .29-.40). Frequency of cannabis use was not significantly associated with increased odds of perpetration of physical aggression in the past year (OR = 1.10, 95% CI = 0.99-1.21). Instead, it appeared to manifest as a trend, with increased frequency of use slightly increasing the odds of past year perpetration. In step two, psychopathic personality was a significant independent predictor of perpetration of IPV (OR = 2.67, 95% CI 1.93-3.70), as was problematic alcohol use (OR = 1.06, 95% CI = 1.03-1.08). Moreover, when both psychopathy and problematic alcohol use were included, the association between cannabis use and perpetration of physical IPV diminished further (OR = 0.91, 95% CI = 0.82-1.02).

### *Psychological Aggression*

Approximately 72% of the sample indicated engaging in some act of psychological aggression in the past year. In step one, frequency of cannabis use was associated with perpetration of psychological aggression (OR = 1.21, 95% CI = 1.09-1.36). In step two, psychopathic personality was not a significant predictor of perpetration of psychological

aggression (OR = 1.16, 95% CI = 0.84-1.61), and alcohol use was significantly associated with perpetration of psychological aggression (OR = 1.05, 95% CI = 1.02-1.07). At step two, cannabis was no longer a significant predictor of perpetration of psychological aggression, with a marginally reduced effect size (OR = 1.12, 95% CI = 0.99-1.26).

### *Gender*

The effects of gender were examined using logistic regression on the cannabis-IPV relationship. There was no significant main effect of gender of perpetration of physical aggression (OR = 1.06,  $p > .05$ ) and there was no significant interaction term (OR = 1.10,  $p > .05$ ). Women reported increased odds of engaging in psychological aggression with their partners (OR = 1.63,  $p < .01$ ); however there was no significant moderating effect of gender on the cannabis-IPV relationship (OR = 1.02,  $p > .05$ ).

**Table 1** Descriptive statistics for proposed predictors for all samples

	<b>Study 1</b>	<b>Study 2</b>	<b>Study 3</b>
CUDIT frequency	1.42 (1.27)	2.00 (1.47)	-
AUDIT	7.47 (5.63)	21.61 (12.22)	-
SRP-II	2.25 (0.46)	2.63 (0.45)	-
# of days past week cannabis use	-	-	2.96(3.40)
# of days past week alcohol use	-	-	3.21 (3.37)
PCL	-	-	8.64(5.43)

CUDIT = Cannabis Use Disorder Identification Test; AUDIT = Alcohol Use Disorder

Identification test; SRP-III = Self-Report Psychopathy Scale III; PCL = Psychopathy

Checklist: Screening Version

## Chapter 3 Study Two

### 3.1 Participants

Participants in study two were drawn from Bridgeway Intensive Residential Treatment in Kelowna, BC, a program subsumed under the Bridge Youth and Family Services Society (The Bridge). The Bridge is a non-profit organization that works with individuals and families to improve health and quality of life through counselling, education, and support. The Bridgeway Intensive Residential Treatment Program (Bridgeway) is a substance use treatment facility that houses 20 participants in a given rotation. The program is a 6 week intensive addictions intervention. The measures and procedures used in this study were not part of the Bridgeway standard intake interview. A total of 68 individuals participated in this study. Twenty respondents were excluded on the basis of not having been in an intimate relationship in the past year, as indicated by blank or zero responses on the IPV measure, and one individual declined to answer the substance use measures. These respondents were subsequently excluded from further analyses for a final sample size of 47. Approximately 54% of participants were females (N=26), and the average age was 40.34 (SD = 12.12), and ranged from 20 to 71. The majority of the sample was Caucasian/White (83%, N = 40). Regarding marital status, 38% reported being never married, and 36% indicated that they were currently married.

### 3.2 Procedure

Participants were introduced to the study by Bridgeway staff following the standard intake procedure. During the introduction, participants were informed that UBC researchers were conducting research on substance use, relationships, and personality. Staff members distributed recruitment signup sheets as well as full informed consent forms for participants

to review. The consent forms described the study in detail. Potential participants were given, at minimum, 24 hours to decide if they wished to participate in the study. If they agreed to be contacted by researchers, research assistants contacted the participants to arrange an appropriate time to meet for an interview and to complete paper copies of the study survey.. This study was embedded within a larger study, which consisted of a detailed quantitative/qualitative interview. The time completion of the larger interview and questionnaires was approximately 90 minutes. Participants were reimbursed \$20.00 for their participation.

### **3.3 Measures**

#### *Intimate Partner Violence:*

As in study one, IPV perpetration was assessed using the Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996), physical assault and psychological aggression perpetration subscales. In addition, due to high levels of psychological aggression in this sample, the psychological aggression subscale was analyzed as past-year prevalence of *severe* psychological aggression, rather than any psychological aggression. Sample items from the severe psychological aggression subscale include “I called my partner fat or ugly” and “I threatened to hit or throw something at my partner.”

#### *Alcohol Use*

The Alcohol Use Disorders Identification Test (Saunders, Aasland, Babor, de la Fuente & Grant, 1993) was used to assess problematic alcohol use.

#### *Cannabis Use*

Frequency of cannabis use was assessed with the frequency question from the Cannabis Use Disorders Identification Test (Adamson & Sellman, 2003).

### *Psychopathic Personality Characteristics*

Psychoopathic personality characteristics was assessed with the Self-Report Psychopathy Scale-III (SRP-III; Williams, Paulhus, & Hare, 2007).

#### **3.4 Analytic Plan**

As with study one, bivariate associations were assessed using Pearson's  $r$ . Following this, stepwise logistic regression was used to assess the independent contributions of cannabis use, alcohol use, and psychopathic personality. Frequency of cannabis use was entered at step one, and psychopathic personality and alcohol use were entered at step two. Nonsignificant effects were removed for final analysis. Finally, to assess gender interactions, moderation analyses were conducted using logistic regression on the cannabis-IPV bivariate association, with gender serving as the potential moderator.

#### **3.5 Results**

Descriptive statistics are presented in Table 1. Data were collected from 68 participants, however a number of missing data points were observed. With regard to the CTS, it was observed that 20 participants had not been in a partnered relationships in the past year, as indicated by all zero or missing responses. Missingness was also observed in the AUDIT (1), cannabis use frequency (1), and SRP (7). One participant declined to answer both the CUDIT and the AUDIT, and was subsequently excluded from further analyses. The missingness of SRP data was examined using SPSS Missing Values Analysis (MVA). Separate variance t-tests were conducted to examine if the missingness of a particular variable was due to any of the other variables included in the analysis. All resulting t tests were nonsignificant. The Little's MCAR test was also nonsignificant ( $\chi^2 = 1.75, p > .05$ ), suggesting that the data are missing completely at random (MCAR). Because the sample size

is considerably smaller than in the other studies, missingness was treated as a separate variable in subsequent analyses. A dummy-coded variable was created differentiating between missing and non-missing cases, and inserted into all analyses as a variable. For the analyses conducted following, mean values were inserted for each of the variables that were missing data.

### *Physical Aggression*

Approximately 46% of the sample indicated they had perpetrated an act of physical aggression against their partner in the past year. Frequency of cannabis use was not significantly associated with problematic alcohol use ( $r = -.13$ , 95% CI =  $-.41-.12$ ) or psychopathic personality ( $r = .26$ , 95% CI =  $-.02-.49$ ). Alcohol use was also unrelated to psychopathic personality ( $r = -.12$ , , 95% CI =  $-.38-.19$ ). Initial analyses using logistic regression revealed that frequency of cannabis use was not associated with perpetration of IPV (OR = 1.03; 95% CI = 0.73-1.47). In addition, at step two, neither psychopathic personality (OR = 1.32, 95% CI = 0.41-4.18) nor problematic alcohol use (OR = 0.98, 95% CI = 0.94-1.02) were predictive of physical aggression perpetration, and frequency of cannabis use was not predictive of perpetration of physical IPV (OR = 0.81, 95% CI = 0.58-1.15).

### *Psychological Aggression*

Approximately 94% of the sample indicated past year psychological aggression against their partner. Due to the high prevalence of psychological aggression, further analyses were conducted using perpetration of severe psychological aggression as the dichotomous outcome variable, and 40% of the sample indicated perpetration of severe psychological aggression. Frequency of cannabis use was not associated with increased odds

of perpetrating severe psychological aggression against a partner (OR = 1.12, 95% CI = 0.79-1.60). Moreover, at step two, neither psychopathic personality (OR = 1.53, 95% CI = 0.48-4.84) nor problematic alcohol use (OR = 1.00, 95% CI = 0.96-1.04) were predictive of perpetration of severe psychological aggression, and frequency of cannabis use remained unassociated with perpetration of severe psychological aggression (OR = 0.84, 95% CI = 0.60-1.18).

### *Gender*

To examine the potential moderating effect of gender, logistic regression was used. Women reported significantly increased odds of perpetration of physical aggression (OR = 7.43,  $p < .01$ , 95% CI = 1.84-29.97); however the Gender x Cannabis Use interaction was nonsignificant, indicating no moderating effect of gender. For psychological aggression, there was no main effect for gender (OR = 0.86,  $p > .05$ ) and no significant gender interaction.

## Chapter 4 Study Three

### 4.1 Participants

Participants in study three were drawn from the existing data in the MacArthur Violence Risk Assessment Study (MVRAS). The MVRAS is a public-access database on a number of risk factors associated with violence in 1,136 male and female civil psychiatric patients between the ages of 18 and 40 (See Monahan et al., 2001 for detailed description of the MVRAS). Follow-up data on violence was collected at five time points 12-months apart. This study utilized responses collected at Wave 1 following discharge for predictor variables, and aggression occurring at any time point over the course of the follow-up period. This yielded a final sample of  $N = 567$ . The sample was predominantly male (56.1%) and White/Caucasian (69.8%). The average age of participants was 29.75 ( $SD=6.16$ ), and ranged from 18 to 40.

### 4.2 Measures

#### *Intimate Partner Violence:*

Violence in the MVRAS has been conceptualized and coded in a number of different ways. The most popular of which is a dichotomous variable indicating the presence/absence of violence. Violence was assessed with questions about a variety of types of incidents, and included questions such as “Have you pushed anyone?”, “Have you hit anyone with your fist or an object?”, or “Have you kicked, bitten, or choked anyone?”. The victims of incidents are coded according to the relationship of the respondent. For the purposes of this study, the presence of IPV is indicated when a person has responded in the affirmative to any of these questions and the victim was a spouse, girlfriend/boyfriend, or ex-partner.

### *Substance Use:*

The use of alcohol in this study was operationalized as frequency, and respondents indicated the number of days they consumed alcohol in the past week at Wave 1. Similarly, cannabis use was assessed according to the number of days of use in the past week.

### *Psychopathic Personality*

Psychopathic personality characteristics in the MVRAS was assessed using the Psychopathy Checklist: Screening Version (Hart, Cox, & Hare, 1995) administered during follow-up. The PCL:SV is a 12-item semi-structured interview that taps antisocial personality characteristics and behaviors. Patients were rated on a 3-point scale the extent to which each item was consistent with the patient's behavior, from 0 (*item is not descriptive of the individual at all*) to 2 (*item is consistent with the individual's behavior*). Total scores are obtained by summing all items. The items of the PCL:SV strongly parallel the extended PCL:R, and research suggests it is an appropriate short form of the parent measure (Cooke, Michie, Hart, & Hare, 1999).

### **4.3 Analytic Plan**

To be as consistent as possible with studies one and two, the same bivariate and multivariable analyses were used with bootstrapping techniques; namely, Pearson's  $r$  to model bivariate associations, and stepwise logistic regression to determine the independent effects of the predictor variables on perpetrator status. Cannabis use served as the step one predictor variable, with alcohol use and psychopathic personality traits serving as step two predictors. Finally, physical IPV served as the outcome variable. Finally, to assess gender interactions, moderation analyses were conducted using logistic regression on the cannabis-IPV bivariate association, with gender serving as the potential moderator.

#### 4.4 Results

Descriptive statistics, means, and standard deviations for all variables are presented in Table 1. Approximately 28% (N = 158) of participants endorsed perpetration of IPV during the follow-up period. Frequency of cannabis use was positively associated with weekly frequency of alcohol use ( $r = .21$ , 95% CI = .05-.37), and unrelated to psychopathic personality ( $r = .08$ , 95% CI = -.07-.23). Weekly alcohol use was uncorrelated with psychopathic personality ( $r = -.03$ , 95% CI = -.17-.11). In step one of the logistic regression frequency of cannabis use was not associated with perpetration of IPV (OR = 0.97, 95% CI = 0.99-1.06). At step two, with the addition of psychopathic personality and weekly alcohol use, cannabis still maintained a nonsignificant association with perpetration of physical IPV (OR = 0.97, 95% CI = 0.88-1.06). Additionally, at this step, neither psychopathic personality (OR = 1.04, 95% CI = 0.98-1.10) nor weekly alcohol use emerged as a significant predictor of perpetration of IPV (OR = 0.96, 95% CI = 0.86-1.07). In sum, frequency of cannabis use was not associated with increased odds of perpetration physical IPV.

##### *Gender*

Logistic regression was used to examine the potential moderating effect of gender on the cannabis-IPV association. There was a significant main effect for gender on perpetration of any IPV, with women indicating increased odds of perpetration (OR = 3.10,  $p < .01$ ). However, there was no significant moderating effect of gender (OR = 1.08,  $p > .05$ ).

## Chapter 5 Conclusion

Though past research has demonstrated an association between cannabis use and perpetration of intimate partner violence, the exact nature of this association has yet to be clearly defined. Indeed, often when it is examined, important variables such as problematic alcohol use and a psychopathic personality style are often not considered. This thesis aimed to examine the plausibility of a spurious effects model of the cannabis-IPV relationship. That is, any association between cannabis use and perpetration of IPV may be due in part to problematic alcohol use and/or psychopathic personality characteristics. As such, this thesis examined a model in which the cannabis-IPV association is accounted for by problematic alcohol use and psychopathy. A primary benefit of the methodology utilized in this thesis is the use of three distinct samples, undergraduate, addictions treatment, and general mental health treatment. The results of these three demonstrate that the associations between substance use and perpetration of intimate partner violence may be variable across samples.

The first hypothesis predicted that cannabis use would be positively associated with perpetration of IPV, as had been reported by previous studies examining this relationship (Moore et al., 2008). Ultimately, this hypothesis was not definitively supported in any of the three studies. It was partially supported in study one using the undergraduate sample, and use of cannabis was associated with a trend of increased odds of categorization as a perpetrator of IPV. Indeed, bivariate associations for cannabis use and perpetration of physical violence have been identified in adolescents and young adults (Rothman, Johnson, Azrael, Hall, & Weinberg, 2010) However, this association was not observed in the subsequent two studies. Indeed, cannabis use was not associated with perpetuation of physical or psychological aggression in either treatment sample.

Hypothesis two predicted that frequency of cannabis use would be associated with both, alcohol use and psychopathic personality. Study one revealed that cannabis use was associated with both alcohol use and with psychopathic personality. Interestingly, cannabis use was unrelated to both alcohol use and psychopathic personality in study two. This may be due, in part, to substantially lower power with a much smaller, homogeneous sample. In study three, cannabis use was associated with more frequent alcohol use, and was unrelated to psychopathic personality.

The final hypothesis predicted that any association that cannabis shared with perpetration of IPV would be reduced when accounting for alcohol use and psychopathic personality. This hypothesis was partially supported in study one. Indeed, the relationship between cannabis use and perpetration of IPV appeared to manifest through shared associations with problematic alcohol use and psychopathy; the weak association between cannabis use and perpetration of physical and psychological aggression was reduced when accounting for problematic alcohol use and psychopathic personality. These findings support the plausibility of a spurious effects model, which posits that the association between cannabis use and perpetration of IPV is due to a third variable. In this case, the cannabis-IPV association (where observed) was reduced by inclusion of problematic alcohol use and psychopathic personality traits, both of which maintained significant associations with perpetration of IPV. The subsequent two studies in this thesis revealed no apparent association between cannabis use and IPV perpetration. Indeed, cannabis use was unrelated to IPV in studies two and three, and spurious effects models could not be adequately tested.

The findings from these three studies may serve to inform public concerns about interpersonal consequences of cannabis use, particularly with regard to violence and

aggression between partners. Across a variety of samples, frequency of cannabis use was weakly related or unrelated to perpetration of IPV. When it was weakly associated, the effects were accounted for by alcohol use and psychopathic personality characteristics. These findings are strengthened by the use of three distinct samples of clinical interest: university students, substance use treatment patients, and civil psychiatric patients. Moreover, these studies used as similar measures as possible in order to maintain consistency of results. Given these findings, and the apparent inconsistent findings present in the literature, cannabis use may be, at most, a minor risk factor for perpetration of IPV. Indeed, the lack of apparent association between cannabis use and perpetration of IPV may be due to the fact that there are myriad of potential risk factors for perpetration of aggression, such as demographic factors (e.g., socioeconomic status, financial and community stress), neighborhood, community, and cultural factors, relationship conflict, school context, adverse childhood events, parenting and family context, peer associations, and other externalizing/internalizing disorders (See Capaldi, Knoble, Shortt, & Kim, 2012). It is possible that cannabis use may be more strongly associated with these risk factors rather than perpetration of IPV itself.

The findings also highlight the apparent inability to apply models of alcohol use and aggression to other substances, and one model of the substance-use violence may not fit all. Indeed, models that characterize the alcohol-IPV relationship, may not be appropriate for describing IPV associations with other psychoactive substances, namely cannabis. This is perhaps unsurprising, given the different pharmacological profiles and effects of cannabis and alcohol. Indeed, there is substantially more support for the causal role of alcohol use in facilitating aggression and IPV (Klosterman & Fals-Stewart, 2006); whereas there is less

evidence for the causal role of cannabis for enabling aggressive responding, and perpetration of IPV. Ultimately, it is likely that no single model (e.g., proximal, indirect, spurious effects) can wholly account for the association between substance use and perpetration of IPV, but rather a combination of both distal and proximal risk factors that lead to violence and aggression.

Finally, the current mainstreaming of cannabis use may actually change the underlying association between cannabis, aggression, and antisociality. Indeed, despite its formal status as an illegal substance with criminal penalties, cannabis has undergone a process of normalization in Canada in which its use has become more accepted in everyday life (Hathaway, Comeau, & Erickson, 2011). This normalizing process (Parker, 2005) is evidenced by increasing social acceptance of recreational and medical use (Hathaway, Erickson, & Lucas, 2007), increasing ease of access (Hathaway, 2004) and prevalence of use (Adlaf et al., 2005), and increasing support for cannabis law reform (Hathaway et al., 2007). Perhaps as cannabis becomes more mainstream and considered less antisocial and less associated with violence and general deviance, the relationship between cannabis and perpetration of IPV may be attenuated.

There are a number of limitations associated with the studies presented in this study. First, the studies examined the cannabis-IPV association in a cross-sectional fashion. Therefore, in the case of study one, the attribution of causality cannot be made. Though the cannabis-IPV relationship was accounted for by alcohol use and psychopathic personality characteristics, it cannot be said that problematic alcohol use causes perpetration of IPV. Indeed, substance use may be conceptualized as both a precursor to and a consequence of partner violence and aggression (Haynie, Farhat, Brooks-Russel, Wang, Babieri, & Iannotti,

2013). Second, in the case of study two, the sample was restricted by homogeneity and low power. Indeed, tests of small effect sizes often require larger sample sizes than was able to be obtained in order to detect them. Third, the series of studies presented in this thesis examined only one partner in an intimate relationship. Given the importance of concordant/discordant substance use by both partners (Smith et al., 2014), future research should examine couples for concordance of substance use when examining intimate partner aggression.

Despite the limitations, the studies present in this thesis represent a systematic examination of the association between cannabis use and perpetration of IPV. Two of three studies indicated no association between frequency of cannabis use and perpetration of IPV. When an association was observed in study one, the effects were reduced when accounting for problematic alcohol use and psychopathic personality. Therefore, partial support was observed for the spurious effects model, particularly in undergraduate students. The findings add to the growing literature on the nature of cannabis use and its relationship to partner violence.

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