RISK FACTORS ASSOCIATED WITH ALCOHOL USE AND INTIMATE PARTNER VIOLENCE

A Dissertation

Presented to

The Faculty of the Department

of Psychology

University of Houston

In Partial Fulfillment

Of the Requirements for the Degree of

Doctor of Philosophy

By

Alexandra L. Snead

May 2020

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ABSTRACT

Research has found a high correlation between alcohol use and violence, though the exact mechanisms associated with the relation requires more research. The current study examined mechanisms that modify the relation between alcohol use and intimate partner violence (IPV) perpetration. The study explored the role of emotion regulation as a potential mediator of the relation between alcohol use and IPV perpetration. Further, changes in state anger after two different relationship tasks were examined to determine if they moderated the direct links between emotion regulation and IPV perpetration. Results suggest that alcohol use was negatively associated with emotion regulation and positively associated with IPV perpetration. Additionally, emotion regulation was found to mediate the relation between alcohol use and IPV. Moreover, alcohol use was found to influence IPV through emotion regulation at high and medium levels of state anger change after laboratory tasks, but these indirect effects did not improve the overall mediation between alcohol and IPV. Clinically, this suggests that treatments for IPV may benefit from including emotional regulation skills, especially for perpetrators who have higher levels of alcohol use and are quick to anger during relationship-related tasks.

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Introduction

Intimate partner violence (IPV) is a serious public health problem that not only has an immediate impact, but also lifelong consequences. IPV is defined as physical, sexual, or psychological harm perpetrated by a current or former romantic partner (Saltzman, Fanslow, McMahon, & Shelley, 2002). In the United States, nearly one in four women and one in seven men have been victims of severe physical violence by a romantic partner (Breiding et al., 2014). Further, more than one in three women and more than one in four men have been the victims of rape, physical violence, and/or stalking by a romantic partner in their lifetimes (Black et al., 2011). Physical violence can be defined as the deliberate use of physical force that has the possibility to cause harm, injury, or death (Breiding, Basile, Smith, Black, & Mahendra, 2015). Sexual violence consists of non-physically pressured unwanted penetration, unwanted sexual contact, noncontact unwanted sexual experience, or forced sexual contact (Breiding et al., 2015). Psychological aggression is the use of verbal or non-verbal communication with the intention of harming another person emotionally or mentally (Breiding et al., 2015). Mental and physical health consequences of IPV include difficulty sleeping, activity limitations, depression, anxiety, PTSD, low self-esteem, and chronic pain (Black et al., 2011). IPV has been found to cost the United States $5.8 billion each year, with direct medical and mental health care services accounting for $4.1 billion (National Center for Injury Prevention and Control, 2003).

The cause of IPV perpetration cannot be explained by one single-factor and is better viewed as resulting from many risk factors. One commonly studied cause is alcohol use. However, the alcohol – IPV relation is neither simple nor necessarily direct, and many factors moderate the relationship (Bennett & Bland, 2008). It is noted that most alcohol drinkers do not

perpetrate IPV, suggesting that IPV perpetration is influenced by other factors that may interact with alcohol use. Factors may include emotion regulation and anger.

Alcohol and IPV

Research has found a high correlation between alcohol use and IPV perpetration (Foran & O'Leary, 2008; Shorey, Stuart, & Cornelius, 2011; Stuart, O'Farrell, & Temple, 2009). Alcohol has been found to facilitate or exacerbate IPV (Jewkes, 2002; Klostermann & Fals-Stewart, 2006). Chermack, Fuller, and Blow (2000) found that approximately 50% of men in substance abuse treatment problems reported perpetrating IPV in the 12 months prior to treatment entry and Gondolf (1998) found that approximately 50% of men in batterer intervention programs have substance use problems. Research has shown that men who drink heavily or are problem drinkers are at a higher risk of IPV perpetration than men who are light or moderate drinkers, or those who do not drink (Coker, Smith, McKeown, & King, 2000; Cunradi, Caetano, Clark, & Schafer, 1999; Field & Caetano, 2004; Kantor & Straus, 1987; O'Leary & Schumacher, 2003; Peralta, Tuttle, & Steele, 2010; Shorey et al., 2011). Additionally, IPV perpetrated by men who abuse alcohol typically occurs more frequently and is more severe than IPV perpetrated by men who do not have problems drinking (Graham, Bernards, Wilsnack, & Gmel, 2011; Murphy, Winters, O'Farrell, Fals-Stewart, & Murphy, 2005; Testa, Quigley, & Leonard, 2003).

However, the causality link between alcohol use and IPV has been controversial. Additionally, there are multiple theoretical models to explain the relation between alcohol use and IPV. The proximal effects model theorizes that alcohol consumption enables aggression directly through psychopharmacological effects on cognitive functioning or expectant effects related to intoxication (Foran & O'Leary, 2008). Alcohol use leads to distorted perceptions of

cues (Barnett & Fagan, 1993; Steele & Josephs, 1990) and lowered inhibitions (Leonard, 1984), which can then lead to increased aggression. Numerous studies have found that IPV perpetration is more likely to occur on days of drinking and shortly after intoxication than on non-drinking days (Fals-Stewart, 2003; Fals-Stewart, Golden, & Schumacher, 2003; Rothman, et al., 2012).

A newer model, the multiple threshold model of IPV, integrates the role of individual differences in understanding the link between alcohol and IPV (Fals-Stewart & Stappenbeck, 2003; Fals-Stewart, Leonard, & Birchler, 2005; Leonard and Quigley, 2017). The multiple thresholds model posits that a range of personality and relationship risk factors for an individual increase the probability that IPV perpetration will occur when the individual is drinking. The model suggests that IPV happens when an individual's aggression threshold is exceeded and it incorporates multiple thresholds because it is believed that there is a higher threshold for more severe aggression than non-severe aggression, primarily due to greater inhibitions to engage in severe aggression. Therefore, the multiple threshold model expands on the proximal effects model and postulates that alcohol may have different psychopharmacological or cognitive effects on individuals with specific personality traits that can lead to differences in the likelihood of IPV perpetration. For example, the model assumes that drinking alcohol for individuals with moderate levels of risk factors may decrease inhibition enough to cause them to be over the threshold for non-severe IPV perpetration while intoxicated (Foran & O'Leary, 2008). Two previous meta-analyses of alcohol and IPV have found that the relation between alcohol and IPV may differ across different moderators (Ferrer, Bosch, Garcia, Manassero, & Gili, 2004; Stith, Smith, Penn, Ward, & Tritt, 2004). Additionally, this relation may differ based on who is reporting the violence and the severity of the violence (Foran & O'Leary, 2008). Overall, there is a need to analyze specific mechanisms responsible for the association between alcohol use and

IPV and how they may interact with other factors. Considering that individuals who drink more are usually more inclined to perpetrate IPV, research would benefit from a more comprehensive understanding of the association.

Emotion Regulation and IPV

Emotional regulation was defined by Gratz and Roemer (2004):

> Emotion regulation may be conceptualized as involving the (a) awareness and understanding of emotions, (b) acceptance of emotions, (c) ability to control impulsive behaviors and behave in accordance with desired goals when experiencing negative emotions, and (d) ability to use situationally appropriate emotion regulation strategies flexibly to modulate emotional responses as desired in order to meet individual goals and situational demands. (pp. 42–43)

Therefore, emotion dysregulation influences behavior in social situations and may facilitate the expression of violence. Finkel (2007) posited that ones' self-regulation abilities impact whether partners are able to avoid acting on aggressive impulses that may occur during the course of the relationship. Finkel stated, "such processes are clearly relevant in the circumstances preceding acts of IPV--and they may dictate to a large extent whether violent impulses are manifested in violent behaviors rather than being restrained" (Finkel, 2007, p. 195). The multiple threshold model can be applied to the relation between difficulties with emotion regulation, alcohol, and IPV perpetration. Difficulties regulating emotions can be seen as a risk factor for increased potential for IPV perpetration. Therefore, individuals with emotion dysregulation have a lower threshold for perpetrating violence and they are more likely to reach the threshold when drinking.

Some researchers have postulated that aggression may serve the purpose of regulating emotions among perpetrators (Jakupcak, Lisak, & Roemer, 2002; Shorey, Cornelius, & Bell, 2008). Additionally, male IPV perpetration has been explained by male gender roles that teach men to inhibit emotional expression, which can then lead them to sometimes using violence to

express or avoid difficult emotions (Jakupcak, Salters, Gratz, & Roemer, 2003; Jakupcak, Tull, & Roemer, 2005). Individuals who experience poor emotion regulation may exhibit higher levels of arousal and be at an increased risk of perpetrating violence (Stappenbeck & Fromme, 2014). A significant positive correlation has been found between men's self-reported frequency of IPV perpetration and perceived limited access to emotion-regulation strategies (Gratz & Roemer, 2004). The strategies used to regulate emotions affect the way we experience them and impact our interpersonal relationships (Petit et al., 2015). Finkel and colleagues (2009) found that participants that were high in dispositional self-control were less likely to perpetrate IPV. Additionally, participants that completed a brief training designed to increase self-regulatory resources displayed less violent inclinations (Finkel, DeWall, Slotter, Oaten, & Foshee, 2009). Deficits in emotion regulation are related to substance abuse (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996) and alcohol use problems can impact the different types of emotion regulation strategies that one employs (Petit et al., 2015). Stopping the use of alcohol has been found to be associated with a change toward more adaptive emotion regulation strategies (Petit et al., 2015). While research has found a relation between emotion regulation difficulties and IPV perpetration, more research is needed to examine how different individual traits interact with other factors to cause IPV perpetration in individuals with increased alcohol use.

Anger and IPV

Anger can be defined as a state emotion, or as a trait personality characteristic. Therefore, state anger refers to a short-lasting outburst of anger. The manifestation of occasional state anger responses is a normal part of life unless it is out of proportion to the triggering event. A proximal link between anger experiences and IPV has been found using electronic daily diary methods (Elkins, Moore, McNulty, Kivisto, & Handsel, 2013). Increases in proximal anger were related

to increases in chances of perpetrating psychological, physical, and sexual violence (Elkins et al., 2013; Iyican, 2017).

Trait anger is characterized by an individual's tendency to experience anger in a range of situations (Spielberger, Sydeman, Owen, Marsh, 1999). Trait anger is often seen as a long-standing personality characteristic. Deffenbacher (1992) found that individuals who are high in trait anger are more likely to experience intense anger during verbal conflict. Studies have found higher trait anger scores among intimate partner violent men when compared to non-violent men (Babcock, Green, Webb, & Yerington, 2005; Beasley & Stoltenberg, 1992). Trait anger has been found to relate to physical IPV among men, and more aggression was reported during periods of state anger for men high in trait anger (Norlander & Eckhardt, 2005). Trait anger has been related to an increase in IPV perpetration (Eckhardt, Jamison, & Watts, 2002). Additionally, trait anger has been linked to increased perpetration of psychological aggression (Taft et al., 2006).

The multiple threshold model can additionally be used to explain the relation between anger, alcohol, and violence. Individuals with high levels of trait anger may reach their threshold for violence more easily when drinking, which lowers their inhibitions and increases their motivation to perpetrate IPV. Additionally, anger can be used as an indicator that may predict whether an individual, in a sober state, is slightly below the non-severe aggression threshold or over the non-severe threshold but below the severe aggression threshold. It is possible that drinking would increase the likelihood of non-severe IPV perpetration since alcohol use decreases the non-severe aggression threshold, but would not likely decrease the threshold enough to cause severe IPV perpetration.

Alcohol, Emotion Regulation, Anger, and IPV

It is commonly presumed that men who perpetrate intimate partner violence have anger problems and inadequate anger control (Murphy, Taft, & Eckhardt, 2007). Individuals who are quick to anger have less ability to regulate their emotions in conflicts and therefore are less likely to be able to negotiate with their partner. Research has found a relation between trait anger and IPV; however, high trait anger does not always lead to IPV perpetration (Norlander & Eckhardt, 2005), indicating the importance of investigating other risk factors that may influence the relation. Research has found that men who report IPV perpetration and who are also high in trait anger are more likely to produce aggressive responses when given alcohol in a laboratory setting (Eckhardt, 2007; Giancola, Saucier, & Gussler-Burkhardt, 2003). Studies have examined IPV perpetrators' changes in state anger when provoked. One experiment found that IPV men reported increases in state anger after both ruminating and distracting from their anger (Babcock & Pothoff, 2019). It is possible that state and trait anger function differently, with highly reactive state anger moderating the impact of characterological trait anger on aggression.

Aims of the Current Study

Research has consistently shown a positive relation between alcohol use and IPV perpetration. However, the specific mechanisms associated with this connection and under which conditions this relation may manifest still requires further study. The current study aimed to explore emotion regulation as a potential mediator of the relations between alcohol use and IPV perpetration. Changes in state anger experienced during different laboratory tasks were examined as a potential moderator of the direct links between alcohol use IPV perpetration. Most studies on IPV focus exclusively on physical violence perpetration. The current study also assessed for psychological aggression and sexual coercion.

Hypotheses. Four hypotheses were tested in a community sample in order to examine the connections among alcohol use, emotion regulation, and trait anger, as well as how these variables interact with IPV. Hypothesis 1 examined the relation between alcohol use and emotion regulation and IPV. Hypothesis 2 examined the mediating role of emotion regulation in the relation between alcohol use and IPV. Hypothesis 3 examined the moderating role of state anger after a naturalistic conflict discussion task, in the direct effect of emotion regulation and IPV. Hypothesis 4 examined the moderating role of state anger after a standardized anger induction task, in the direct effect of emotion regulation and IPV.

1. Alcohol use will be negatively associated with emotion regulation and positively associated with IPV perpetration.
2. Emotion regulation will mediate the positive association between alcohol use and IPV, such that higher levels of alcohol use will be associated with higher levels of IPV through decreased emotion regulation.
3. The direct effect of emotion regulation on IPV will be moderated by state anger after the conflict discussion task, such that for men who have high changes in state anger, the negative direct effect of emotion regulation on IPV will be stronger than for men who have low changes in state anger.
4. The direct effect of emotion regulation on IPV will be moderated by state anger after the anger induction task, such that for men who have high changes in state anger, the negative direct effect of emotion regulation on IPV will be stronger than for men who have low changes in state anger.

Method

Sample

Couples were recruited as part of larger research studies on intimate partner violence. Couples were recruited through newspaper advertisements and flyers requesting "couples experiencing conflict." A telephone screen was conducted on interested couples to determine study eligibility. During the screening, female partners were given a modified version of the Conflict Tactics Scales (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) to determine violence levels of the couple. Couples were asked to participate in the studies if the female partner reported two or more instances of male-to-female acts of violence in the past year, these couples were included in the IPV group. Additionally, a small comparison group of demographically- and relationship satisfaction-matched Distressed/Nonviolent (DNV) couples were also recruited in this study. For these couples, female participants denied a history of physical abuse but endorsed relationship unhappiness and psychological abuse in the past year. The eligibility criteria included: (a) at least 18 years of age or older (b) speaking English fluently (c) married or living together as if married for at least six months, and (d) the female partner must not have anticipated future violence from her partner as a result of participating in the study.

Procedure

Data were collected on two occasions, each of which lasted approximately three hours. During the first assessment period, only male participants were administered a serious of questionnaires. The second assessment period included both the male and female partner, during which both were administered questionnaires followed by an interview, a marital interaction task, and debriefing and payment. Couples were compensated between 90 and 100 dollars for

their participation in the two assessment periods and were paid an extra 10 dollars if they showed up on time for both appointments.

Anger Induction Task. The Articulated Thoughts in Simulated Situations paradigm (ATSS; Davison, Robins, & Johnson, 1983) was used to induce anger in male participants in the first session. The task includes two audiotaped vignettes. Previous research has found that the vignettes induce anger in male IPV perpetrators (Eckhardt, Barbour, & Davison, 1998). For the first vignette, male participants were asked to imagine as if they were overhearing a conversation between their wife and someone else. In the scenario, the wife was recorded describing her husband as "a loser" and a poor financial provider. In the second vignette, the wife is heard preparing dinner and flirting with another man in their home.

Play-by-Play Interview and Conflict Discussion. The Play-by-Play Interview (Hooven, Rushe, & Gottman, 1996) was administered in order to clarify an actual conflict area the couple experiences in their relationship. In the interview, couples independently rank how much difficulty they experience across ten common areas that lead to marital discord on a scale of 0 to 100. The interviewer inquires more information on the highest rated items, or the items most discrepant between the man and woman to find an unresolved problem that appears to be emotionally loaded. Couples were then asked to engage in a 15-minute conflict discussion with their partner regarding the unresolved problem. In no couples did the conflict discussion become violent, although many couples became psychologically abusive to each other (e.g. yelling, swearing, etc).

Measures

Intimate Partner Violence. The Revised Conflict Tactics Scale (CTS2; Straus et al., 1996) was completed by male and female participants to assess the severity and frequency of

physical violence and sexual coercion. The CTS2 is a 78-item questionnaire measuring instances of male-to-female and female-to-male physical, psychological, and sexual abuse that occurred in the past year. The scale includes five subscales: physical assault, psychological aggression, sexual coercion, injury, and negotiation. Female participants provided responses to test items measuring their male partner's physically abusive, psychologically abusive, and sexually coercive behaviors that had occurred in the past year on a 7-point rating scale (e.g., never, once, twice, 3-5 times, 6-10 times, 11-20 times, and more than 20 times). The current study utilized the physical assault, psychological abuse, and sexual coercion subscales only, all containing six items. Internal consistency coefficients for the full CTS2 range from .79 to .95, depending on different subscales used (Straus et al., 1996). Within our sample, internal consistency coefficients for the physical assault subscale was .83, the psychological abuse subscale was .75, and the sexual coercion subscale .82.

Alcohol Use. The Alcohol Use Disorders Identification Test (AUDIT; World Health Organization, 2001) was completed by male participants to assess their alcohol use. The AUDIT includes four items on problems related to alcohol use, three items on alcohol consumption, and three items on dependence symptoms. The first eight items are scored from 0 to 4 (e.g. 0 = *never*, 1 = *less than monthly*, 2 = *monthly*, 3 = *weekly*, and 4 = *daily or almost daily*), while the last two items are score from 0 (no), 2 (Yes, but not in the past year), and 4 (Yes, during the past year) resulting in a total score from 0 to 40 with higher score indicating greater alcohol misuse severity. For the current study, the internal consistency was .82.

Emotion Regulation. The Negative Mood Regulation Scale (NMR; Catanzaro & Mearns, 1990) was completed by male participants to assess their ability to cope with negative emotions. Each question represents different cognitive and behavioral strategies for coping with

negative moods, and participants rate to what extent they think each strategy will typically work for them to improve a negative mood. The NMR includes 30 items, each scored from 1 to 5 (1 = *strongly disagree* to 5 = *strongly agree*), with higher scores representing a greater belief in one's capability to improve a negative mood. The NMR is divided into a *cognitive* subscale with ten questions reflecting cognitive strategies for negative mood regulation (e.g., I'll feel better when I understand why I feel bad) a *behavioral-social* subscale with six questions reflecting mood-regulating behaviors that are completed with others (e.g., Going out to dinner with friends will help), a *behavioral-alone* subscale, with four questions reflecting mood-regulating behaviors that are completed alone (e.g., Catching up with my work will help me calm down), and a *general* subscale, with ten questions reflecting mood-regulating strategies that do not fall specifically into cognitive or behavioral categories (e.g., It won't be long before I can calm myself down). For the current study, the alpha was .86.

Trait Arousability. The Trait Arousability Scale (TAS; Mehrabian, 1994) was used as another measure of emotional dysregulation. Mehrabian (1994) stated that people high in trait arousability are "more emotional (in both positive and negative ways); they experience strong emotions more easily and, once they become emotional, it takes them longer to get back to a normal, unemotional state" (pg. 2). The TAS consists of 34 items rated on a 9-point Likert format (-4 = *very strong disagreement,* 0 = *neither agreement nor disagreement,* +4 = *very strong agreement*). High scores indicate problems with emotional regulation. For the current study, the alpha was .70.

Trait and State Anger. The State-Trait Anger Expression Inventory (STAXI; Spielberger, 1988) was completed by male participants to assess their anger. The STAXI includes 57 items that measure experience, expression, and control of anger and includes six

subscales: state anger, trait anger, anger expression-out, anger expression-in, anger control-out, and anger control-in. For this study, the trait anger and state anger subscales will be used. The 15-item state anger scale includes three subscales: feeling angry, feel like expressing anger verbally, and feel like expressing anger physically. Participants rated each item on the trait anger scale on a 4-point Likert-type scale (1 = *almost never*, 4 = *almost always)* and for state anger (1 = *not at all*, 4 = *very much so),* with a higher score representing higher levels of anger. The STAXI state anger items were administered multiple times. In order to mask the purpose of these repeated assessments, non-angry words were interspersed (e.g. happy, peaceful). Additionally, the order of items presented on the STAXI items varied each time it was administered. Changes in state anger from baseline to the experimental tasks were calculated by subtracting the state anger score taken 1) before and after the conflict discussion and 2) before and after the standardized anger induction task. For the state anger change scores, the residuals were used. The alpha for the trait anger scale was .76; alphas for repeated measures of the state anger scale averaged .73 in the current sample.

Data Analytic Strategy

Data were analyzed using structural equation model (SEM) in *Mplus,* Version 8.3 (Muthén & Muthén, 1998-2018). First, bivariate intercorrelations were analyzed among the main study variables (alcohol use, emotion regulation, trait anger, physical assault, psychological aggression, and sexual coercion). Specifically, these correlations examined the relations between (a) alcohol use and emotion regulation, and (b) emotion regulation and physical assault, (c) emotional regulation and psychological aggression, and (d) emotion regulation and sexual coercion. Male age was significantly correlated with IPV perpetration (r = -.19, p <.01) and male education level was significantly related to emotion regulation (r = .15, p < .05) and IPV

perpetration (r = .18, p < 05); therefore, age and education level were entered as covariates in the subsequent analyses. For these analyses, 95% confidence intervals (CIs) were considered significant if they did not include zero and 5,000 replications (bootstrapping tests) were used.

Emotion regulation and IPV perpetration were represented as latent constructs with three indicators each, while alcohol use was represented as a manifest variable. In the structural model, directional paths led from alcohol use to emotion regulation and IPV perpetration as well as from emotion regulation to IPV perpetration. Additionally, directional paths led from covariates (including male age and education) to emotion regulation and IPV perpetration to adjust for these constructs in the model. Models were fit with the maximum likelihood (ML) estimator in MPlus 8.3 (Muthén & Muthén, 1998-2018). Model fit was assessed with the root mean square error of approximation (RMSEA), with values of less than .06 indicating excellent fit and values above .10 suggesting poor fit; a Comparative Fit Index (CFI), with values between .95 and 1.00 indicating excellent fit and values between .90 and .94 indicating acceptable fit; and standardized root mean square residual (SRMR), with values less than .08 indicating acceptable fit (Hu & Bentler, 1999).

Latent variables were first created in separate SEM models. Scores from the TAS, NMR, and trait anger subscale of the STAXI were used to create a latent variable of emotion regulation. Scores for TAS and STAXI were reverse scored so that higher scores to represent better emotion regulation. CTS-2 subscales of physical abuse, psychological aggression, and sexual coercion were used to create a latent variable for IPV perpetration.

Moderated mediation analysis was used to examine the extent to which the associations between alcohol use and IPV are mediated by emotion regulation and the extent to which the direct relations between emotion regulation and IPV variables are moderated by changes in state

anger. As such, two moderated mediation models were examined. In the first model, alcohol use served as the independent variable, IPV perpetration as the dependent variable, emotion regulation as the mediator, and state anger change after the conflict discussion as the moderator. In the second model, alcohol use served as the independent variable, IPV perpetration as the dependent variable, emotion regulation as the mediator, and state anger change after the anger induction task as the moderator.

Results

Demographics

The full sample consisted of 160 ethnically-diverse couples "experiencing conflict" recruited from the community. Male participant's average age was 31.50 (*SD* = 9.75) and the female partners' average age was 29.38 (*SD* = 8.91). Of the participants that reported income, mean gross family income was approximately $28,000 (*SD* = 18,210), suggesting that a large percentage of the sample was living below the poverty level. For males in this sample, approximately 47% were African American, 32% were Caucasian, 14% were Hispanic, 5% were Asian, and 2% identified as members of other racial and/or ethnic groups. Of the female participants, 79% reported some male-to-female physical abuse in the past year, while 94% of the female participants reported male-to-female physical abuse or psychological abuse in the past year. Additionally, 95% of the female participants reported experiencing either male-to-female physical abuse, psychological abuse, or sexual coercion in the past year. The number of physical assault acts in the last year ranged from 0 to 72 (*M* = 7, *SD* = 14), the number of psychological aggression acts ranged from 0 to 129 (*M* = 33, *SD* = 31), and the number of sexual coercive acts ranged from 0 to 46 (*M* = 4, *SD* = 9).

Hypothesis 1

Means, standard deviations, and bivariate intercorrelations among all study variables are presented in Table 1. Intercorrelations revealed that alcohol use was negatively associated with emotion regulation (r = -.29, p <.00), and positively associated with IPV perpetration (r = 0.20, p < .01). As such, Hypothesis 1 was supported.

Hypothesis 2

The initial measurement model in which no directional paths were specified and constructs of interests (i.e., alcohol use, emotion regulation, and IPV perpetration) were free to covary and provided evidence for good fit for the data (χ^2[12] = 12.77, p = .047, RMSEA = .02 [90% CI: .00, .08], SRMR = .04, CFI = .99). Thus, results from the measurement model supported us proceeding with the structural model.

The mediation model was constructed to assess the indirect relationship between alcohol use and IPV perpetration through emotion regulation. IPV perpetration was entered as the outcome variable, alcohol use was entered as the predictor variable, and emotion regulation was entered as the mediator. Findings from the hypothesized structural model indicated a significant association between alcohol use and emotion regulation after controlling for covariates (b = -.06, SE = .02, 95% CI [-.58, -.14]). Emotion regulation had a significant association with IPV perpetration (b = -.51, SE = .22, 95% CI [-.77, -.24]), but the direct effect from alcohol use to IPV perpetration after controlling for covariates was not significant, b = .01, SE = .02, 95% CI [-.20, .25]. Lastly, there was a medium to large (k^2 = 0.18) indirect effect of alcohol use on IPV perpetration through emotion regulation, b = .03, SE = .02, 95% CI [.01, .10]. More alcohol use was associated with lower emotion regulation abilities; low emotion regulation, in turn, was

associated with more IPV perpetration. Thus, results provided support for Hypothesis 2. See Figure 1.

To further strengthen the interpretation of Hypothesis 2, an alternative model was tested by reversing the proposed explanatory variable for the model (Preacher & Hayes, 2004); specifically, emotion regulation was the predictor, alcohol use was the indirect variable, and IPV perpetration remained as the criterion variable. The indirect effect of the alternative model was non-significant, b = -.03, SE = .04, 95% CI = [-.14, .06].

Hypothesis 3

To test the hypothesis that changes in state anger after the conflict discussion task moderated the indirect relationship between alcohol use and IPV perpetration through emotion regulation, a moderated mediation model was constructed (see Figure 2). IPV perpetration was entered as the outcome variable, alcohol use was entered as the predictor variable, and emotion regulation was entered as the mediator; changes in state anger after the conflict discussion task were entered as a moderator and male age and education were entered as covariates. We began by examining the levels of changes in state anger after the conflict discussion. At +1 standard deviation of change in state anger after the conflict discussion there was a significant relation between emotion regulation on IPV perpetration, b = .03, SE = .04, 95% CI [.02, .21] and at the mean of changes in state anger after the conflict discussion there was a significant relationship, b = .05, SE = .04, 95% CI [.01, .17]. Therefore, for individuals who had average and high levels of change in state anger after the conflict discussion, there was a strong negative relation between emotion regulation and IPV perpetration. When examining at -1 standard deviation of change in state anger after conflict discussion, there was no significant relation, b = .03, SE = .04, 95% CI [-.03, .14]; therefore, individuals who were not angered during conflict discussion, emotion

regulation was unrelated to IPV perpetration. Nonetheless, these effects were not significantly different. Changes in state anger after the conflict discussion did not significantly moderate the indirect relationship between alcohol use and IPV perpetration through emotion regulation when controlling for male age and education (Index of Moderated Mediation = .02, 95% CI = -.00, 0.11). See Figure 2.

Hypothesis 4

Next, to test the hypothesis that changes in state anger after the anger induction task moderated the indirect relationship between alcohol use and IPV perpetration through emotion regulation, a second moderated mediation model was constructed. IPV perpetration was entered as the outcome variable, alcohol use was entered as the predictor variable, and emotion regulation was entered as the mediator; changes in state anger after the anger induction task was entered as a moderator and male age and education were entered as covariates. Examining the process at $\pm$1 standard deviation of changes in state anger after the conflict discussion, at +1 standard deviation of change in state anger after the anger induction task, there was a significant positive effect, b = .13, SE = 0.08, 95% CI [.03, 0.36] and at the mean of changes in state anger after the anger induction task there was a significant positive effect, b = .09, SE = .06, 95% CI [.02, .27] between emotion regulation on IPV perpetration. Therefore, for individuals who had average or high increases in state anger after the anger induction task there was a strong relation between emotion regulation and IPV perpetration. When examining at -1 standard deviation of change in state anger after anger induction task, there was no significant relationship, b = .06, SE = .05, 95% CI [-.004, .20]; therefore, in individuals with low anger reactivity to the induction task, emotion regulation was not related IPV perpetration. However, these effects were not significantly different. Changes in state anger after the anger induction task did not significantly

moderate the indirect relationship between alcohol use and IPV perpetration through emotion regulation when controlling for male age and education (Index of Moderated Mediation = .04, 95% CI = -0.001, 0.12). See Figure 3.

Discussion

The purpose of this study was to add to the literature by examining the specific mechanisms associated with the relation between alcohol use and IPV perpetration. The study explored the role of emotion regulation as a potential mediator of the relation between alcohol use and IPV perpetration. Additionally, state anger was examined as a potential moderator of the direct link between alcohol use and IPV perpetration through emotion regulation. Most studies on IPV focus on physical violence perpetration, however, the current study also included psychological aggression and sexual coercion. Alcohol use was found to be negatively associated with emotion regulation and positively associated with IPV perpetration. Additionally, emotion regulation was found to mediate the relationship between alcohol use and IPV. However, overall changes in state anger after an anger induction task and after a conflict discussion did not moderate the association between emotion regulation and IPV perpetration.

Corroborating findings from previous studies, alcohol use was negatively related to emotion regulation (Bradizza et al., 2018) and positively related to IPV perpetration (Foran & O'Leary, 2008). Additionally, emotion regulation was found to mediate the relation between alcohol use and IPV perpetration, meaning that individuals with high alcohol use and poor emotion regulation abilities perpetrated more violence, which is also consistent with previous studies that have found a relation between alcohol use, emotion regulation, and IPV perpetration (Ortiz, Shorey, Cornelius, 2015).

It was hypothesized that there would be a moderating effect of changes in state anger after both a conflict discussion and an anger induction task, between the relation of emotion regulation and IPV perpetration. However, these hypotheses were not supported. Therefore, changes in state anger did not improve the overall model between alcohol use on IPV through emotion regulation.

Men who are high-risk drinkers and have emotion regulation problems perpetrated more overall violence at home against their partner in the past year, suggesting that men may perpetrate less violence towards their partner if they are better able to manage their anger during arguments. Adding anger reactivity to the conflict discussion task did not improve the model fit. The moderated mediation models may have failed to reach significance because of the variability of the argument topic or the partners' behavior. For the standardized anger induction, for the men who were not angered by these tasks, there was no relation between their emotional regulation and their violence perpetration. The model may have failed to reach significance due to the fact that the anger induction task was simulated and it may not have been relevant to all participants. Therefore, anger may not have been induced in all participants; even though studies have found them to induce anger. Future studies may find it beneficial to create imaginal situations that are specific to each couple to induce anger in more realistic situations, which are more likely to happen in their everyday lives. For example, if the male partner is really angered when his partner does not answer her phone or respond to text messages right away, then an imaginal situation of their partner taking hours to respond to his communication would be used. It may be that some men are violent towards their partner, not due to poor emotion regulation, but rather as a means of controlling their emotions or partner. Additionally, some men may have been raised in a home where violence was accepted as normal; therefore violence perpetration may be seen as purposeful and not due to emotion dysregulation (Forke et al., 2018). Many

variables, including relationship dissatisfaction, are related to IPV perpetration (Panuzio & DiLillo, 2010). Future research may benefit from using relationship satisfaction as a potential moderator between emotion regulation and IPV perpetration.

The strengths of this experimental study include sample diversity and the assessment of different types of IPV perpetration. The study was conducted using an ethnically diverse community sample which supports the generalizability of the results. Additionally, the current study not only examined physical IPV perpetration, but created a latent IPV variable that included psychological and sexual coercion, which usually receive less attention in the literature, even though psychological abuse is the most common form of aggressive behavior in intimate relationships (Shorey, Cornelius, & Bell, 2008).

Limitations and Future Directions

While there are strengths associated with the current study, it is not without limitations. Aside from the experimental provocation of state anger, this study was cross-sectional which limits the ability to make causal inferences about alcohol, emotional regulation, and IPV. Future research would benefit from longitudinal investigations on the role of alcohol use and the relationship dynamics regarding emotion regulation and IPV perpetration. This could be done via daily diary studies, where participants keep track of their alcohol use, anger, emotion regulation, and aggression to test causal links between alcohol use, emotion regulation, and anger after a real-life, anger-provoking situation. Additionally, researchers may find it beneficial to look at other possible emotions besides anger in relation to IPV perpetration. For example, it may be that other emotions such as sadness or shame were evoked during the conflict discussion and anger induction and that other emotions also impact IPV perpetration (Shorey, Strauss, Elmquist, Anderson, & Stuart, 2017). Second, the questionnaires administered may not be the best

available measures. The NMR and TAS measures of emotional regulation have been supplanted by newer emotion regulation scales (e.g. the DERS; Gratz & Roemer, 2004). There was only one measure of alcohol use (AUDIT) so a latent variable could not be created for that construct. Future researchers may benefit from utilizing different measures for assessing emotionregulation and more measures to assess for alcohol use. Additionally, all measures examining emotion regulation and alcohol use were self-report. Future studies may choose to incorporate both self-report and partner reports of emotion regulation and alcohol use. Additionally, future studies may experimentally manipulate both anger and alcohol in the lab, as has been done in other studies with IPV perpetrators (Eckhardt, 2007). For example, completing an anger induction task and a conflict discussion task among IPV men randomly assigned to drink alcohol versus a placebo could directly test alcohol's effect on anger and emotion regulation. Further, this study combined samples from two different studies with slightly different methods. In the first study, all assessments and tasks took place on the same day; whereas for the second study the anger induction and conflict discussion tasks were administered on two separate days.

Lastly, this study only examined male perpetrated IPV. As IPV is also commonly perpetrated by women (Straus, 2008; Whitaker, Haileyesus, Swahn, & Saltzman, 2007) it would be beneficial for future researchers to examine the association between alcohol, emotional regulation, and female perpetrated IPV. It may be that patterns of alcohol use and IPV differ for female and male perpetrators. Additionally, it may be important to take into consideration the context of the partner's alcohol use, emotion regulation, anger, and IPV perpetration into account. Future experimental studies may find it useful to administer the Taylor aggression paradigm (TAP; Taylor, 1967) in a laboratory setting to determine if individuals do actually become more aggressive towards their partner after an anger-inducing situation.

Clinical Implications

Current interventions for IPV stop violence by an additional five percent over and above the effects of arrest alone (Babcock, Green, & Robie, 2004). One reason that current treatment options are minimally effective at stopping IPV may be a "one-size-fits-all" approach, ignoring differences in emotional regulation and alcohol use. The relation between alcohol, emotion regulation, and IPV perpetration can be important to understand for treatment purposes. Not all individuals who use alcohol perpetrate violence. Therefore, it is important to understand what mechanisms are related to the alcohol-IPV link in order to create the best treatment options. Individuals who drink heavily may be using alcohol to help avoid negative feelings but alcohol may interfere with emotion regulation and inadvertently increase their risk of perpetrating IPV. Therefore, treatment may benefit from incorporating more emotion regulation skills, especially for those individuals with high alcohol use. Helping to develop emotion regulation skills can help reduce vulnerability toward unwanted emotions and increase emotional resiliency when these feelings do come up, which then may decrease IPV perpetration. Interventions that teach individuals how to recognize they are having an emotional response and help them accept the emotional response rather than responding with violence (Taft, Macdonald, Creech, Monson, & Murphy, 2016; Zarling, Bannon, & Berta, 2019. Additionally, it may be beneficial to teach mindfulness skills, that individuals can use to help them reduce the intensity of the emotion that has in the past lead them to perpetrate violence against their partner. Researchers have begun to use mindfulness skills in treatment protocols for IPV perpetrators (Zarling, et al., 2019). Research has found mindfulness-based interventions may be successful in decreasing aggression and violence (Gillions, Cheang, & Duarte, 2019)

Results suggest that the effects of emotion regulation on IPV may be more prevalent at high levels of anger reactivity. Therefore, battering interventions may benefit from including anger management techniques. Although anger management is not sufficient as a stand-alone treatment for IPV, inclusion of anger management techniques may be a useful component of battering intervention programs. The skills may include deep breathing or taking a time-out by removing themselves from the situation.

In conclusion, findings of the current study corroborate those of previous research showing that high-risk alcohol use is related to decreased emotion relation skills and increased IPV perpetration. Emotion regulation mediated the relation between alcohol use and IPV perpetration, suggesting that emotionally dysregulated men may drink alcohol in an attempt to regulate their affect. However, this strategy fails as it increases the risk of IPV. Examining the association between alcohol use, emotion regulation, anger and IPV perpetration can assist researchers and clinicians with insight for new directions for battering intervention and prevention programs

References

Babcock, J. C., Green, C. E., & Robie, C. (2004). Does batterers' treatment work? A meta-analytic review of domestic violence treatment. *Clinical Psychology Review, 23*(8), 1023-1053.

Babcock, J. C., Green, C. E., Webb, S. A., & Yerington, T. P. (2005). Psychophysiological profiles of batterers: Autonomic emotional reactivity as it predicts the antisocial spectrum of behavior among intimate partner abusers. *Journal of Abnormal Psychology, 114,* 445-455.

Babcock, J. C. & Pothoff, A. (2019) *Effects of angry rumination and distraction in intimate partner violent men*. Manuscript submitted for publication.

Barnett, O. W., & Fagan, R. W. (1993). Alcohol use in male spouse abusers and their female partners. *Journal of Family Violence, 8*(1), 1−25.

Beasley, R., & Stoltenberg, C. D. (1992). Personality characteristics of male spouse abusers. *Professional Psychology, Research and practice, 23,* 310-317.

Bennett, L., & Bland, P. (2008). Substance abuse and intimate partner violence. VAWnet.org (pp. 1 – 16). Retrieved from http://vawnet.org/Assoc_Files_VAWnet/AR_SubstanceRevised.pdf

Black M. C., Basile, K. C., Breiding, M. J., Smith S. G., Walters M. L., Merrick M. T., Chen, J., & Stevens, M. R. (2011). *The National Intimate Partner and Sexual Violence Survey (NISVS): 2010 Summary Report.* Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/violenceprevention/nisvs/summaryreports.html

Bradizza, C. M., Brown, W. C., Ruszczyk, M. U., Derman, K. H., Lucke, J. F., & Stasiewicz, P. R. (2018). Difficulties in emotion regulation in treatment-seeking alcoholics with and without co-occurring mood and anxiety disorders. *Addictive Behaviors, 80,* 6-13.

Breiding, M. J., Basile, K. C., Smith, S. G., Black, M. C., & Mahendra, R. R. (2015). *Intimate Partner Violence Surveillance: Uniform Definitions and Recommended Data Elements, Version 2.0*. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/violenceprevention/intimatepartnerviolence/definitions.html

Breiding, M. J., Smith, S. G., Basile, K. C., Walters, M. L., Chen, J., & Merrick, M. T. (2014). Prevalence and Characteristics of Sexual Violence, Stalking, and Intimate Partner Violence Victimization—National Intimate Partner and Sexual Violence Survey, United States, 2011. *Morbidity and Mortality Weekly Report (MMWR), Surveillance Summaries, 63*(SS08): 1–18. Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/ss6308a1.html

Catanzaro, S. J., & Mearns, J. (1990). Measuring generalized expectancies for negative mood regulation: Initial scale development and implications. *Journal of Personality Assessment, 54,* 546-563.

Chermack, S. T. & Fuller, B. E., & Blow, F. C. (2000). Predictors of expressed partner and non-partner violence among patients in substance abuse treatment. *Drug and Alcohol Dependence, 58, 43-54.*

Coker, A. L., Smith, P. H., McKeown, R.E., & King, M. J. (2000). Frequency and correlates of intimate partner violence by type: physical, sexual, and psychological battering. *American Journal of Public Health, 90,* 553–559.

Cunradi, C. B., Caetano, R., Clark, C. L., and Schafer, J. (1999). Alcohol-related problems and intimate partner violence among White, Black and Hispanic couples in the U.S. *Alcoholism: Clinical and Experimental Research, 23*(9), 1492–1501.

Davison, G. C., Robins, C., & Johnson, M. K. (1983). Articulated thoughts during simulated situations: A paradigm for studying cognition in emotion and behavior. *Cognitive Therapy and Research, 7,* 17-40.

Deffenbacher, J. L. (1992). Trait anger: Theory, findings and implications. In C. D. Spielberger & J. N. Butcher (Eds.), *Advances in personality assessment* (pp. 177- 201). Hillsdale, NJ: Erlbaum.

Eckhardt, C. I. (2007). Effects of alcohol intoxication on anger experience and expression among partner assaultive men. *Journal of Consulting and Clinical Psychology, 75*(1), 61-71. http://dx.doi.org/10.1037/0022-006X.75.1.61

Eckhardt, C. I., Barbour, K. S., & Davison, G. C. (1998). Articulated thoughts of martially violent and nonviolent men during anger arousal. *Journal of Consulting and Clinical Psychology, 66,* 259-269.

Eckhardt, C. I., Jamison, T. R., & Watts, K. (2002). Anger experience and expression among male dating violence perpetrators during anger arousal. *Journal of Interpersonal Violence, 17,* 1102-1114. doi:10.1177/088626002236662

Elkins, S. R., Moore, T. M., McNulty, J. K., Kivisto, A. J., & Handsel, V. A. (2013). Electronic diary assessment of the temporal association between proximal anger and intimate partner violence perpetration. *Psychology of Violence, 3,* 100-113.

Fals-Stewart, W. (2003). The occurrence of partner physical aggression on days of alcohol consumption: A longitudinal diary study. *Journal of Consulting and Clinical Psychology, 71*(1), 41−52.

Fals-Stewart, W., Golden, J., & Schumacher, J. A. (2003). Intimate partner violence and substance use: A longitudinal day-to-day examination. *Addictive Behaviors, 28*(9), 1555−1574.

Fals-Stewart, W., Leonard, K. E., & Birchler, G. R. (2005). The occurrence of male-to-female intimate partner violence on days of men's drinking: The moderating effects of antisocial personality disorder. J*ournal of Consulting and Clinical Psychology, 73*(2), 239-248.

Fals-Stewart, W., & Stappenbeck, C.A. (2003). Intimate partner violence and alcohol use: The role of drinking in partner violence and implications for intervention. Family Law Psychology Briefs, 4, Retrieved August 18th, 2005 from http://www.jmcraig.com/subscribers/archives.htm.

Ferrer, V., Bosch, E., García, E., Manassero, M. A., & Gili, M. (2004). Meta-Analytic Study of Differential Characteristics Between Batterers and Non-Batterers: The Case of Psychopathology and Consumption of Alcohol and Drugs. *Psykhe: Revista de la Escuela de Psicología, 13*(1), 141-156.

Field, C. A., & Caetano, R. (2004). Ethnic differences in intimate partner violence in the U.S. general population: The role of alcohol use and socioeconomic status. *Trauma Violence & Abuse, 5*, 303-317

Finkel, E. (2007). Impelling and inhibiting forces in the perpetration of intimate partner violence. *Review of General Psychology, 11,* 193–207.

Finkel, E. J., DeWall, C. N., Slotter, E. B., Oaten, M., & Foshee, V. A. (2009). Self-regulatory failure and intimate partner violence perpetration. *Journal of Personality and Social Psychology*, *97*, 483-499.

Foran, H. M. & O'Leary, K. D. (2008). Alcohol and intimate partner violence: A meta-analytic review, *Clinical Psychology Review, 28,* 1222-1234.

Forke, C. M., Myers, R. K., Fein, J. A., Catollazzi, M., Localio, A. R., Wiebe, D. J., & Grisso, J.A. (2018) Witnessing intimate partner violence as a child: How boys and girls model their parents' behavior in adolescence. *Child Abuse & Neglect, 84,* 241-252.

Giancola, P. R., Saucier, D. A. and Gussler-Burkhardt, N. L. (2003), The Effects of Affective, Behavioral, and Cognitive Components of Trait Anger on the Alcohol-Aggression Relation. Alcoholism: Clinical and Experimental Research, 27: 1944-1954. doi:10.1097/01.ALC.0000102414.19057.80

Gillions, A., Cheang, R., & Duarte, R. (2019). The effect of mindfulness practice on aggression and violence levels in adults: A systematic review. *Aggression and Violent Behavior, 48,* 104-115.

Gondolf, E. (1998). Multi-Site Evaluation of Batterer Intervention Systems: A 30-Month Follow-Up of Court-Mandated Batterers in Four Cities. Paper presented at the Program Evaluation and Family Violence Research: An International Conference, Durham, New Hampshire.

Graham, K., Bernards, S., Wilsnack, S. C., & Gmel, G. (2011). Alcohol may not cause partner violence but it seems to make it worse: a cross national comparison of the relationship between alcohol and severity of partner violence. *Journal of Interpersonal Violence*, *26*(8), 1503–1523. http://doi.org/10.1177/0886260510370596

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, *26*(1), 41–54.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology, 64*, 1152-1168.

Hooven, C., Rushe, R. & Gottman, J. M. (1996). The Play-by-Play Interview. In J. M. Gottman (Ed.) *What predicts divorce? The measures*. Mahwah, NJ: Lawrence Erlbaum Associates.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55.

Iyican, S. (2017). *The Proximal Effect of Alcohol on Intimate Partner Violence*. Dissertation submitted to the University of Houston, Dept of Psychology.

Jakupcak, M., Lisak, D., & Roemer, L. (2002). The role of masculine ideology and masculinity gender role stress in men's perpetration of relationship violence. *Psychology of Men & Masculinity*, *3*, 97-106.

Jakupcak, M., Salters, K., Gratz, K. L., & Roemer, L. (2003). Masculinity and emotionality: an investigation of men's primary and secondary emotional responding. *Sex Roles*, *49*, 111–120.

Jakupcak, M., Tull, M. T., & Roemer, L. (2005). Masculinity, shame, fear of emotions as predictors of men's expressions of anger and hostility. *Psychology of Men & Masculinity, 6*, 275–284.

Jewkes, R. (2002). Intimate partner violence: Causes and prevention. *The Lancet, 359,* 1423-1429.

Leonard, K. (1984). Alcohol consumption and escalatory aggression in intoxicated and sober dyads. *Journal of Studies on Alcohol*, 45, 75-80. 10.15288/jsa.1984.45.75.

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 Alcohol Review, 36,* 7–9.

Kantor, G., & Straus, M.A. (1987). The drunken bum theory of wife beating. *Social Problems, 34,* 213-230.

Klostermann, K. C., & Fals-Stewart, W. (2006). Intimate partner violence and alcohol use: Exploring the role of drinking in partner violence and its implications for intervention. *Aggression and Violent Behavior, 11*(6), 587-597.

Mehrabian, A. (1994). *Manual for the Revised Trait Arousability Scale*. (Available from Albert Mehrabian, 1130 Alta Mesa Road, Monterey, CA, USA 93940).

Murphy, C. M., Taft, C. T., & Eckhardt, C. I. (2007). Anger problem profiles among partner violent men: Differences in clinical presentation and treatment outcome. *Journal of Counseling Psychology, 54*(2), 189–200. doi: 10.1037/0022-0167.54.2.189

Murphy, C. M., Winters, J., O'Farrell, T. J., Fals-Stewart, W., & Murphy, M. (2005). Alcohol Consumption and Intimate Partner Violence by Alcoholic Men: Comparing Violent and Nonviolent Conflicts. *Psychology of Addictive Behaviors*, *19*(1), 35-42. doi: 10.1037/0893-164X.19.1.35

Muthén, L.K. and Muthén, B.O. (1998-2017). *Mplus User's Guide. Eighth Edition*. Los Angeles, CA: Muthén & Muthén.

National Center for Injury Prevention and Control (2003). *Costs of intimate partner violence against women in the United States*. Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/violenceprevention/pub/IPV_cost.html

Norlander, B., & Eckhardt, C. (2005). Anger, hostility, and male perpetrators of intimate partner violence: A meta-analytic review. *Clinical Psychology Review*, *25*, 119-152

Norlander, B., & Eckhardt, C. (2005). Anger, hostility, and male perpetrators of intimate partner violence: A meta-analytic review. *Clinical Psychology Review*, *25*, 119-152. Doi:10.1016/j.cpr.2004.10.001

O'Leary, K. D., & Schumacher, J. A. (2003). The association between alcohol use and intimate partner violence: Linear effect, threshold effect, or both?, *Addictive Behaviors, 28*(9), 1575-1985.

Ortiz, E., Shorey, R. C., Cornelius, T. L. (2015). An examination of emotion regulation and alcohol use as risk factors for female-perpetrated dating violence. *Violence and Victims, 30*(3), 417.431.

Panuzio, J., & DiLillo, D. (2010). Physical, psychological, and sexual intimate partner aggression among newlywed couples: longitudinal prediction of marital satisfaction. *Journal of Family Violence, 25*(7), 689–699.

Peralta, R. L., Tuttle, L. A., & Steele, J. L. (2010). At the intersection of interpersonal violence, masculinity, and alcohol use: The experiences of heterosexual male perpetrators of intimate partner violence. *Violence Against Women, 16*(4), 387-409.

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

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879-891.

Rothman, E. F., Stuart, G.L., Winter, M., Wang, N., Bowen, D., Bernstein, J., Vinci, R. (2012) Youth alcohol use and dating abuse victimization and perpetration: A test of the relationship at the daily level in a sample of pediatric emergency department patients who use alcohol. *Journal of Interpersonal Violence*, *27*(15), 2959-2979.

Saltzman, L. E., Fanslow, J. L., McMahon, P. M., & Shelley, G. A. (2002). *Intimate partner violence surveillance: Uniform definitions and recommended data elements, version 1.0* Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/violenceprevention/pdf/ipv/intimate-partner-violence.pdf

Shorey, R. C., Cornelius, T. L., & Bell, K. M. (2008). Behavior theory and dating violence: A framework for prevention programming. *Journal of Behavior Analysis of Offender and Victim Treatment and Prevention*, *1*(4), 298–311.

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. doi: 10.1016/j.avb.2011.08.003.

Shorey, R. C., Strauss, C., Elmquist, J., Anderson, S., Stuart, G. L (2017) Examining the reactions of women in substance use treatment as participants in a study on intimate partner violence: Does sham proneness matter? *Partner Abuse, 8*(4), 396-408.

Spielberger, C. D. (1988). *State-Trait Anger Expression Inventory*. Orlando, FL: Psychological Assessment Resources.

Spielberger, C. D., Sydeman, S. J., Owen, A. E., & Marsh, B. J. (1999). Measuring anxiety and anger with the State-Trait Anxiety Inventory (STAI) and the State-Trait Anger Expression Inventory (STAXI). In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (p. 993–1021). Lawrence Erlbaum Associates Publishers.

Stappenbeck, C. A., & Fromme, K. (2014). The effects of alcohol, emotion regulation, and emotional arousal on the dating aggression intentions of men and women. *Psychology Of Addictive Behaviors, 28*(1), 10-19. doi:10.1037/a0032204

Steele, C. M., & Josephs, R. A. (1990). Alcohol myopia: Its prized and dangerous effects. *American Psychologist, 45*(8), 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 Violence Behavior, 10*(1), 65-98.

Straus, M. A. (2008). Dominance and symmetry in partner violence by male and female university students in 32 nations. *Children and Youth Services Review, 30,* 252–275. doi:10.1016/j.childyouth.2007.10.004

Straus, M. A., Hamby, S. L., Boney-McCoy, S., & Sugarman, D. B. (1996). The Revised Conflict Tactics Scales (CTS2). *Journal of Family Issues, 17,* 283-316.

Stuart, G. L., O'Farrell, T. J., & Temple, J. R. (2009). Review of the association between treatment for substance misuse and reductions in intimate partner violence. *Substance Use & Misuse, 44*(9-10), 1-17. doi:10.1080/10826080902961385.

Taft, C. T., Macdonald, A., Creech, S. K., Monson, C. M., Murphy, C. M. (2016) A randomized controlled clinical trial of the strength at home men's program for partner violence in military veterans. *The Journal of Clinical Psychiatry, 77*(9), 1168-1175.

Taft, C. T., O'Farrell, T. J., Torres, S. E., Panuzio, J., Monson, C. M., Murphy, M., & Murphy, C. M. (2006). Examining the correlates of psychological aggression among a community sample of couples. *Journal of Family Psychology, 20,* 581- 588.

Taylor, S. P. (1967). Aggressive behavior and physiological arousal as a function of provocation and the tendency to inhibit aggression1". *Journal of Personality*. *35*(2): 297–310. doi:10.1111/j.1467-6494.1967.tb01430.x.

Testa, M., Quigley, B. M., & Leonard, K. E. (2003). Does alcohol make a difference? Within-participants comparisons incidents of partner violence. *Journal of Interpersonal Violence, 18*(7), 735-743.

Whitaker, D. J., Haileyesus, T., Swahn, M., & Saltzman, L. S. (2007). Differences in frequency of violence and reported injury between relationships with reciprocal and nonreciprocal intimate partner violence. *American Journal of Public Health, 97,* 941–947. doi:10.2105/AJPH .2005.079020

World Health Organization. (2001). AUDIT : the Alcohol Use Disorders Identification Test : guidelines for use in primary health care / Thomas F. Babor ... [et al.], 2nd ed. World Health Organization.

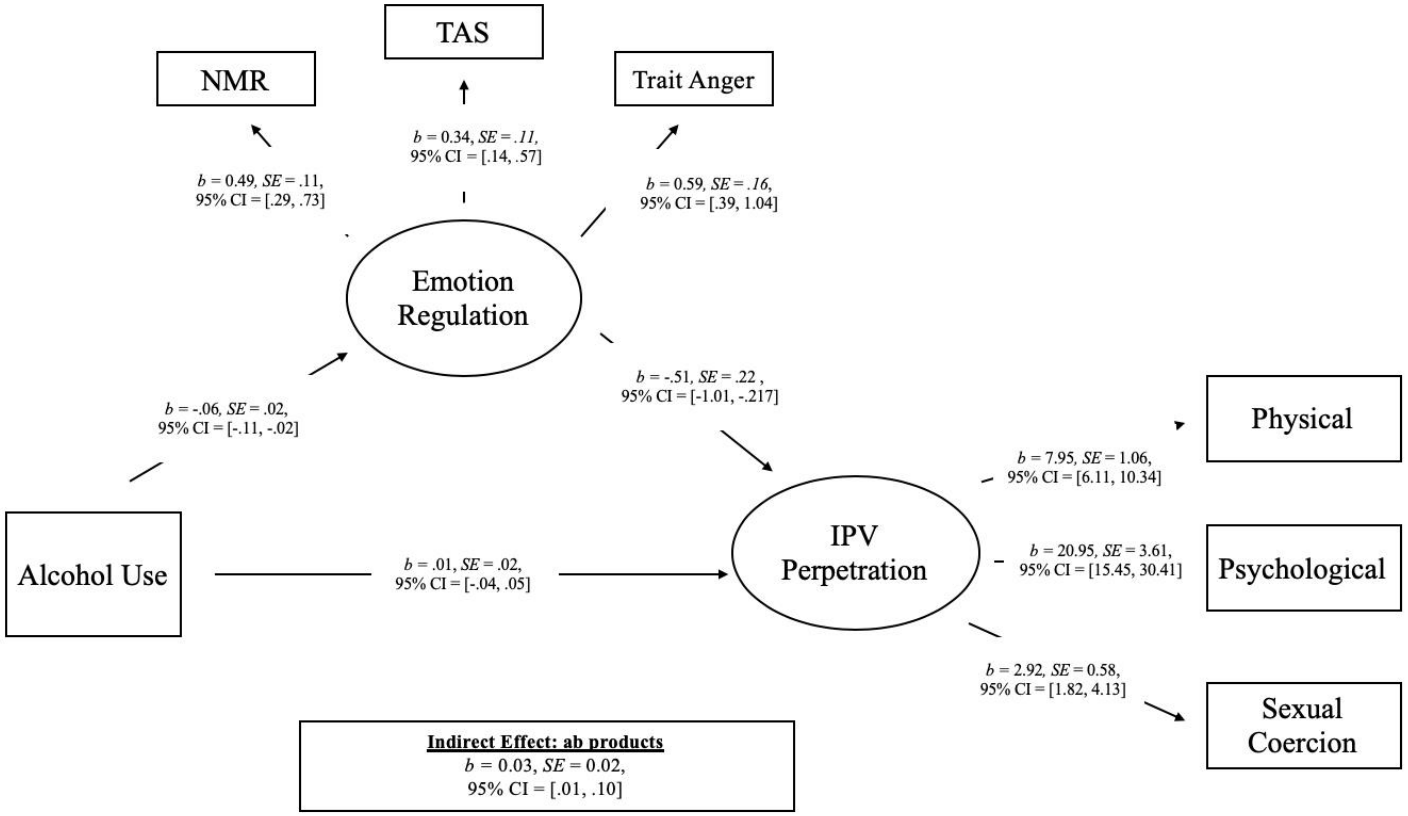
Zarling, A., Bannon, S., & Berta, M. (2019). Evaluation of Acceptance and Commitment Therapy for Domestic Violence Offenders. *Psychology of Violence, 9*(3), 257-266.

Table 1. *Descriptive statistics and Pearson Correlations among study variables*

Variable	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11
1. NMR	6.34(6.46)	-										
2. TAS	2.45(28.46)	.26**	-									
3. Trait Anger	18.01(5.46)	.33**	.24**	-								
4. Physical	8.01(12.64)	-.22**	-.07	-.30**	-							
5. Psychological	34.13(31.20)	-.13	-.03	-.31**	.57**	-						
6. Sexual Coercion	4.62(7.02)	-.09	-.01	-.20**	.32**	.41**	-					
7. Alcohol Use	6.33(6.34)	-.22**	-.22**	-.20**	.24**	.16*	.06	-				
8. Emotion Regulation	-	.85**	.53**	.71**	-.29**	-.23*	-.15	-.29**	-			
9. IPV	-	-.18*	-.07	-.33**	.72**	.96*	.49**	.20**	-.28**	-		
10. State Anger after CD	.84(3.86)	-.15	-.08	-.15	.27**	.11	.03	.03	-.18*	.14	-	
11. State Anger after AI	5.03(4.59)	-.17	-.10	.22**	-.09	-.13	-.17	-.07	-.19*	.05	.12	-

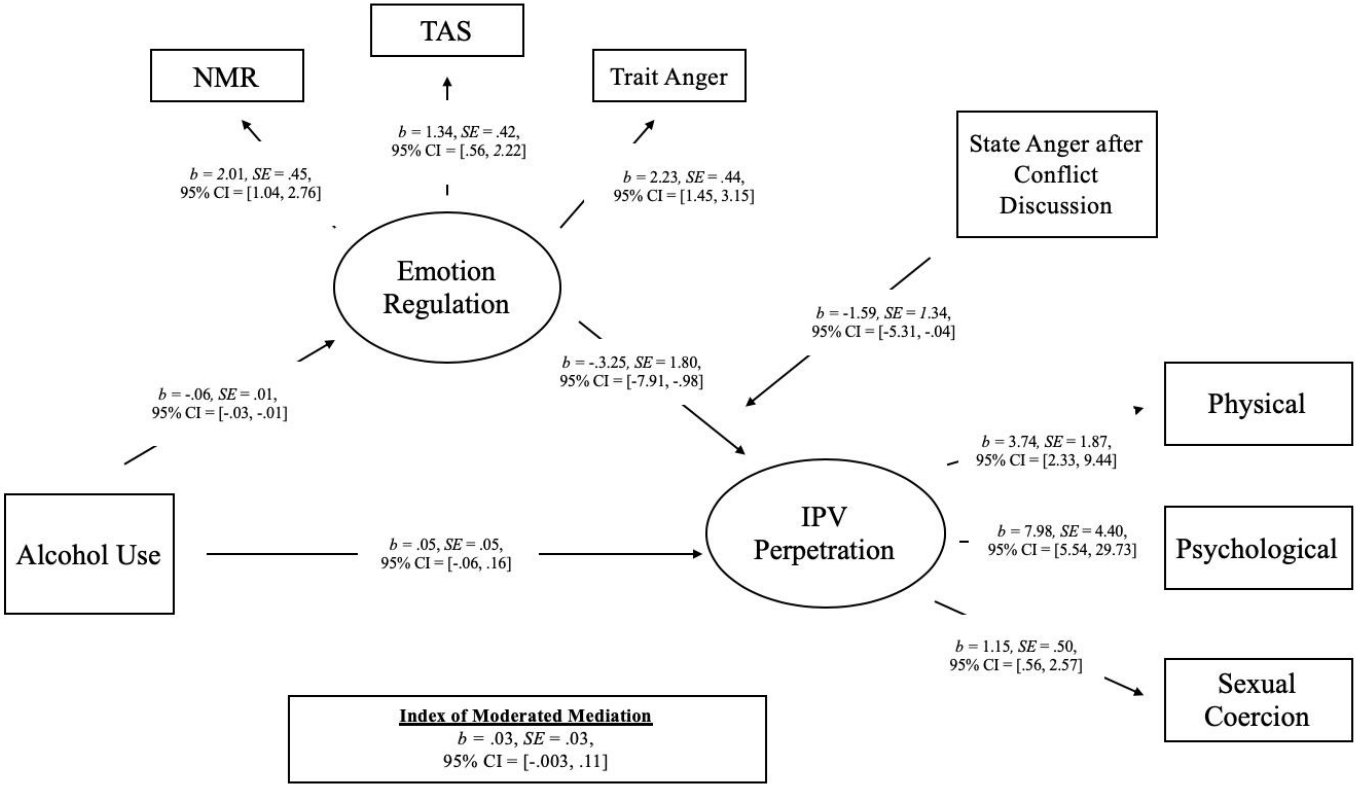
Note. ** $p < .01$, * $p < .05$. NMR = Negative Mood Regulation Scale; TAS = Trait Arousability Scale; Trait Anger = Trait anger scores from STAXI; Physical = Female report of male's physical violence; Psychological = Female report of male's psychological violence; Sexual Coercion = Female report of male's sexual coercion; Emotion Regulation = latent variable created from NMR, TAS, and Trait Anger; IPV = latent variable created from physical, psychological, and sexual coercion; State Anger after CD = Changes in state anger after a conflict discussion task; State Anger after AI = Changes in state anger after an anger induction task.

Figure 1: Hypothesis 2; Structural equation model of the indirect and direct effects of alcohol use on IPV perpetration via emotion regulation



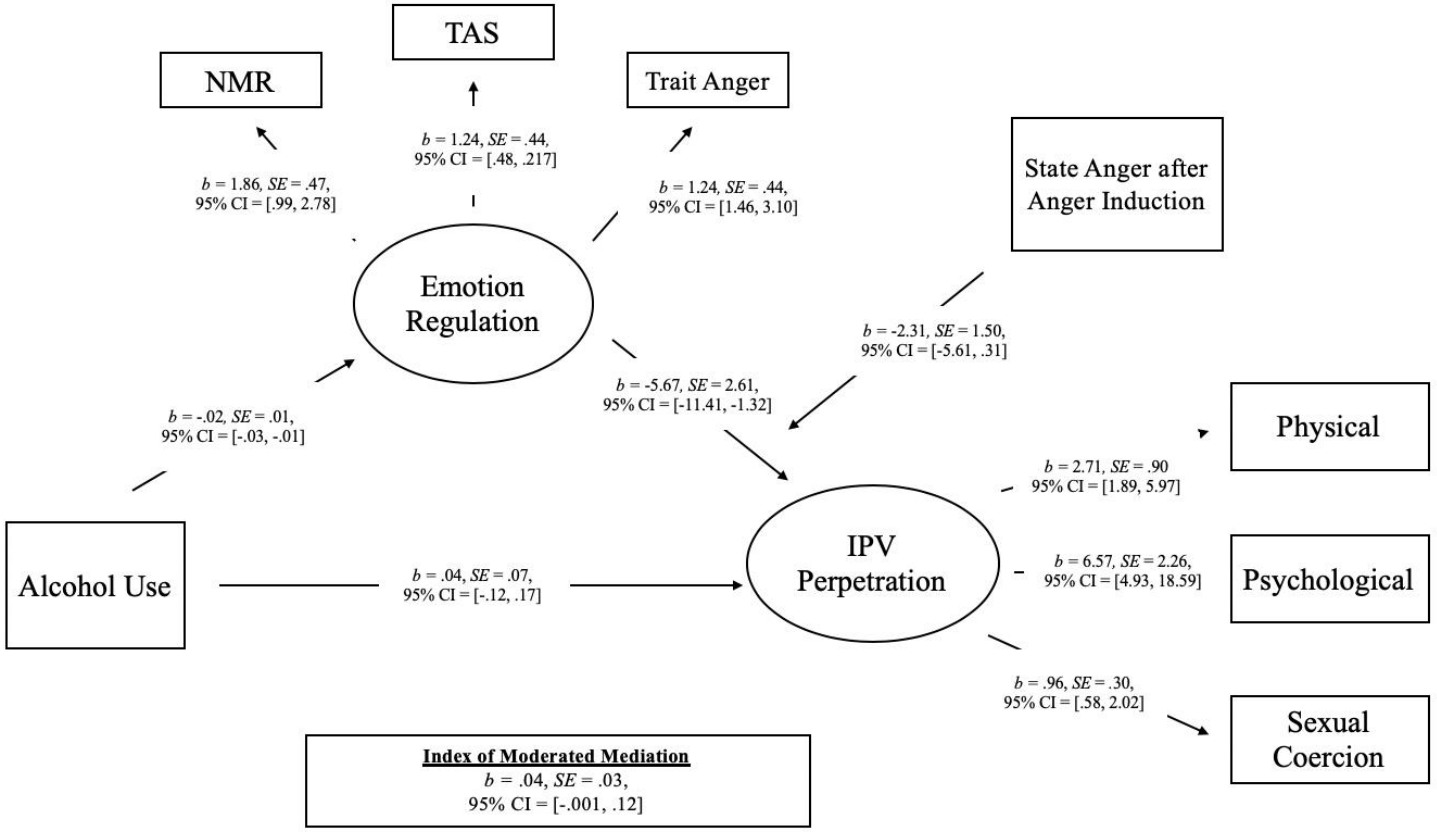
Note: Unstandardized coefficients, standard error and 95% confidence intervals are presented. NMR = Negative Mood Regulation Scale; TAS = Trait Arousability Scale; Trait Anger = Trait anger scores from STAXI; Physical = Female report of male's physical violence; Psychological = Female report of male's psychological violence; Sexual Coercion = Female report of male's sexual coercion. Covariates included male age and education level.

Figure 2. Hypothesis 3. Moderated mediation model with changes in state anger after a conflict discussion task as the moderator on the way in which emotion regulation mediates the relation between alcohol and IPV perpetration.



Note: Unstandardized coefficients, standard error and 95% confidence intervals are presented. NMR = Negative Mood Regulation Scale; TAS = Trait Arousability Scale; Trait Anger = Trait anger scores from STAXI; Physical = Female report of male's physical violence; Psychological = Female report of male's psychological violence; Sexual Coercion = Female report of male's sexual coercion; State Anger after Conflict Discussion = Changes in state anger after a conflict discussion task. Covariates included male age and education level.

Figure 3. Hypothesis 4. Moderated mediation model with changes in state anger after an anger induction task as the moderator on the way in which emotion regulation mediates the relation between alcohol and IPV perpetration.



Note: Unstandardized coefficients, standard error and 95% confidence intervals are presented. NMR = Negative Mood Regulation Scale; TAS = Trait Arousability Scale; Trait Anger = Trait anger scores from STAXI; Physical = Female report of male's physical violence; Psychological = Female report of male's psychological violence; Sexual Coercion = Female report of male's sexual coercion. State Anger after Anger Induction = Changes in state anger after an anger induction task. Covariates included male age and education level