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The Effects of Alcohol, Emotion Regulation, and Emotional Arousal on the Dating Aggression Intentions of Men and Women

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Abstract

Verbal and physical dating aggression is prevalent among college-aged men and women, especially a pattern of mutual aggression in which both partners engage in aggression. Alcohol intoxication and anger arousal have both been implicated in the occurrence of aggression, and the ability to regulate one's emotions may interact with both alcohol intoxication and emotional arousal to predict dating aggression. The current study is the first known experimental investigation to examine the effects of alcohol intoxication, alcohol expectancies, emotion regulation, and emotional arousal on dating aggression. Participants were randomized to receive alcohol (*n*=48), placebo (*n*=48), or no alcohol (*n*=48). Intoxicated men and women expressed more verbal and physical aggression intentions than those in the no alcohol condition, and individuals in the placebo condition did not significantly differ from those in the alcohol and no alcohol conditions. These results suggest that the pharmacological effects of alcohol were important to the occurrence of dating aggression, whereas the effects of expectancy are less clear. Among those less able to engage in cognitive reappraisal, individuals who consumed alcohol or believed they consumed alcohol expressed more verbal and physical aggression intentions than those who received no alcohol. Those with higher arousal who were better able to suppress their emotions expressed fewer verbal and physical aggression intentions than those with lower arousal. In addition to reducing alcohol consumption, interventions to prevent dating aggression might incorporate emotion regulation skills, with a focus on understanding the circumstances in which cognitive reappraisal and emotion suppression are relatively more effective.

Keywords

dating aggression; alcohol intoxication; emotion regulation; emotional arousal

Intimate partner violence occurs at a high rate among dating couples, with verbal aggression reported by as many as 82% and physical aggression by as many as 21% of dating partners within a 12-month period (Shook, Gerrity, Jurich, & Segrist, 2000). Verbal and physical aggression are often highly correlated (Lundeberg, Stith, Penn, & Ward, 2004), as 94% of those who reported physical aggression also reported verbal aggression (Shook et al., 2000). Men and women tend to perpetrate dating aggression at similar rates (Katz, Kuffel, &

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Coblentz, 2002; Riggs, O'Leary, & Breslin, 1990; White & Koss, 1991), providing support for situational couple violence (Johnson, 1995), which is a prevalent pattern of aggression by both partners in which verbal aggression may escalate to mild physical aggression within a discrete conflict (Sillars, Roberts, Dun, & Leonard, 2002). As support for this pattern of aggression, between one half and two-thirds of adolescents and young adults who reported dating aggression indicated that the aggression was mutual (Gray & Foshee, 1997; Whitaker, Haileyesus, Swahn, Saltzman, 2007). Therefore, it is important to investigate the aggressive behavior of both men and women in dating relationships and the factors that may be associated with their aggression.

Alcohol Influences Interpersonal Aggression

Consumption of alcohol has been consistently related to interpersonal aggression, including partner aggression (for review, see Bushman & Cooper, 1990; Leonard & Quigley, 1999; Wells, Mihic, Tremblay, Graham, Demers, 2008). An event-level investigation concluded that both men and women increased their use of verbal aggression, and women increased their use of physical aggression, following alcohol consumption (Shook et al., 2000). Additionally, intoxicated men with a history of perpetrating partner aggression expressed more aggression intentions in response to marital conflict scenarios than intoxicated men without a history of perpetration and all men who had not consumed alcohol (Eckhardt, 2007). In one known experimental investigation of aggression intentions that included dating men and women, more aggressive intentions were reported among those who received alcohol compared to those who received placebo, and there were no gender differences (Eckhardt & Crane, 2008).

The association between alcohol and aggression may be explained by the pharmacological effects of alcohol intoxication or by alcohol expectancies. According to alcohol myopia theory, acute alcohol intoxication may influence the stimuli to which an individual attends by narrowing one's attentional focus to the most salient cues (Steele & Josephs, 1990; Taylor & Leonard, 1983). Acute alcohol intoxication can also lead to impairment in executive cognitive functioning related to regulatory processes that would otherwise inhibit behavior (Giancola, 2000). Taken together aggression may be more likely when intoxicated, especially in response to salient aggressive cues (Curtin, Patrick, Lang, Cacioppo, & Birbaumer, 2001). Indeed, aggression measured in the laboratory has been found to generally increase at higher doses of alcohol (Bond & Lader, 1986; Duke, Giancola, Morris, Holt, & Gunn, 2011). Although Duke and colleagues (2011) found a linear association between alcohol dose and aggression for both men and women, the effect was only observed at the high doses (i.e., 0.75 g/kg and 1.0 g/kg). There were no differences in aggression between any of the lower alcohol doses (i.e., 0.5 g/kg and below) suggesting that aggression is more likely at higher levels of intoxication.

Expectancy theory suggests that the belief that alcohol leads to aggression results in greater levels of aggression. Although alcohol expectancies have been shown to lead to other behavioral risks such as unsafe sex (Dermen & Cooper, 2000; Hendershot, Stoner, George, & Norris, 2007; Maisto, Carey, Carey, & Gordon, 2002), findings on the association between expectancies and aggression are mixed. Whereas some individuals with stronger

alcohol outcome expectancies for aggression display more aggressive behavior in response to alcohol (Dermen & George, 1989; Leonard & Senchak, 1993), others do not (Norris & Kerr, 1993; Quigley & Leonard, 1999), leaving questions about the relative contributions of pharmacology and expectancy in explaining the association between alcohol and aggression.

Emotion Regulation and Alcohol Intoxication

Emotion regulation involves processes whereby individuals evaluate their affective state and take action to modify their affective experiences or expressive behaviors (Goldsmith & Davidson, 2004; Gross, 1998, 1999). Affective states can be regulated in a variety of ways, including the use of cognitive reappraisal processes to modify thoughts about emotionally laden situations in order to decrease emotional responses (Gross & John, 2003). The process of cognitive reappraisal occurs before the emotional response is fully developed and can help individuals alter their emotional experience and thereby reduce the likelihood for negative behaviors such as aggression. Suppression can also be used to regulate emotions by inhibiting the verbal or behavioral expression of emotion (Gross & John, 2003). Therefore, employing emotion regulation strategies may help reduce the occurrence of aggression, whereas poor emotion regulation could result in increases (Baumeister, Heatherton, Tice, 1994).

Alcohol intoxication may further contribute to aggression by interfering with the ability to effectively regulate emotions and subsequent behavioral responses. Emotion regulation strategies often rely on the higher order cognitive processes that are impaired by alcohol (Curtin & Fairchild, 2003). Likewise, an individual who expects that alcohol will lead to aggression may less readily employ regulatory strategies to prevent aggression (Testa et al., 2006). Therefore, alcohol intoxication and the expectation that alcohol has been consumed may limit one’s ability to regulate his or her emotions and thereby increase the likelihood of aggression.

The Role of Emotional Arousal in Interpersonal Aggression

Individuals who exhibit poor emotion regulation may experience high levels of arousal and be at increased risk of perpetrating aggression. A high level of anger arousal, for example, has been related to the occurrence of interpersonal aggression (Berkowitz, 1993; Eckhardt, Barbour, & Stuart, 1997; Holtzworth-Munroe & Clements, 2007; Schumacher, Feldbau-Kohn, Slep, & Heyman, 2001). Studies of both dating and married men have concluded that those with a history of partner aggression articulated more aggression intentions during anger arousal than men without a history of partner aggression (Eckhardt, Jamison, & Watts, 2002). Moreover, individuals with a history of dating aggression engaged in more frequent anger-expressive behaviors, exhibited less control over their anger, and had poorer anger management skills than individuals with no history of dating aggression (Barbour, Eckhardt, Davison, & Kassinove, 1998; Dye & Eckhardt, 2000; Eckhardt, Barbour, & Davison, 1998; Lundeberg et al., 2004). Therefore, a poorer ability to regulate emotions is associated with greater emotional arousal, which in turn is associated with increased aggression.

Present Investigation

No known study has examined the effects of alcohol intoxication, alcohol expectancies, emotion regulation, and emotional arousal on dating aggression. Therefore, the current investigation provided an initial examination of these factors in a sample of men and women. Both alcohol (target dose .08%) and placebo conditions as well as a no alcohol control condition were included to assess the pharmacological and expectancy effects of alcohol on aggression intentions. A complete 2 × 2 balanced placebo design was not employed given that participants in the anti-placebo condition (i.e., told no alcohol but given alcohol) often report having consumed alcohol even at moderate blood alcohol concentrations (i.e., .06%) that were exceeded in the current study (Sayette, Breslin, Wilson, & Rosenblum, 1994). We hypothesized that: (1) individuals in the alcohol and placebo conditions would report more aggression intentions than those in the no alcohol condition; (2) emotion regulation would moderate the association between beverage condition and aggression intentions such that participants in the alcohol and placebo conditions who have poorer abilities to regulate their emotions would report more aggression intentions than those better able to regulate their emotions and those who received no alcohol; and (3) poor emotion regulation would be associated with more aggression intentions, especially among those individuals with greater levels of emotional arousal compared to those who are better able to regulate their emotions and have lower levels of emotional arousal.

Method

Participants

Participants (N = 150; 51% female) were recruited from a pool of introductory psychology students at a large southwestern university, as well as from newspaper advertisements, flyers around the community and campus, and Internet advertisements. Inclusion criteria were established to recruit a young adult sample of moderate drinkers most likely to relate to the dating scenarios and include: 1) ages 21–30; 2) in a current dating relationship for at least one month but not be married; 3) self-identify as heterosexual; and 4) alcohol non- naïve (defined as having consumed at least three drinks in one sitting at least three times during the past three months). Participants had an average age of 23.1 (SD = 2.2), average family income of $55,000, and their ethnic distribution was 51.4% White, 22.2% Hispanic, 16.0% Asian, 2.8% Black, and 7.6% multi-ethnic or other. The majority of participants indicated that their current dating relationship was exclusive (80%) whereas 16.6% were in non-exclusive dating relationships and 3.5% were engaged. The majority of participants (56.3%) reported that they were in their current relationship for more than 12 months.

Procedures

The university's Institutional Review Board approved all study procedures. Participants were screened over the telephone to determine that they met eligibility criteria as well as the National Institute of Alcohol Abuse and Alcoholism (NIAAA, 2005) recommendations for the ethical administration of alcohol, including the absence of symptoms of alcohol dependence and/or medical and personal contraindications to the ingestion of alcohol. Eligible participants were informed that they may consume alcohol as part of the study

procedures and were instructed to eat a meal four hours prior to their scheduled appointment and refrain from consuming alcohol for the 24-hours before their session. Prior to arriving in the laboratory, participants were randomly assigned to an alcohol, placebo, or no alcohol condition, with separate consent forms used for the no alcohol condition than for the placebo or alcohol condition. Upon arrival, participants completed informed consent, presented their photo identification as proof of legal drinking age, and took a breathalyzer test (Intoxilyzer 5000, CMI, Inc. Owensboro, KY) to ensure an initial .00% breath alcohol concentration (BrAC). Female participants were also required to self-administer a hormonal pregnancy test. Participants then completed self-report measures including those of emotion regulation.

Beverage manipulation—Trained research assistants mixed the drinks using standardized alcohol administration dose calculations, based on participants' gender and weight. For the alcohol condition, beverages contained a 1:3 mixture of 80 proof vodka (men: 2.389 ml/kg of body weight; women: 2.174 ml/kg of body weight) to mixer to achieve a target BrAC of .08%. For the placebo condition participants received the same 1:3 ratio of decarbonated tonic to mixer. For the no alcohol condition participants were given beverages of chilled water in an amount equal to the liquid they would have received in either the alcohol or placebo conditions. All participants were given three separate drinks and asked to consume each one in 10 minutes for a total of 30 minutes to consume the beverages.

Once in the simulated bar, multiple steps were taken to ensure the credibility of the placebo manipulation based on those initially outlined by Rohsenow and Marlatt (1981). Research assistants who did not know the actual contents of the sealed vodka bottle told participants in the alcohol and placebo conditions were told they were consuming alcohol and prepared the drinks in front of the participants. Participants in the no alcohol condition were told they were not consuming alcohol as research assistants poured their beverages of chilled water. Following a 15-minute absorption period, participants completed a set of questionnaires that included a beverage manipulation check. A staff member aware of the participant's beverage condition assessed their BrACs and provided participants in the alcohol and placebo conditions with the same false visual feedback indicating a BrAC of .04%. At approximately 60- and 90-minutes after finishing their last drink, participants provided subsequent BrACs.

Audio-Taped dating scenarios—Professionally produced audio-taped scenarios served as the stimuli that were administered using the Articulated Thoughts in Simulated Situations (ATSS; Davison, Robins, & Johnson, 1983) procedures. The ATSS is a think-aloud procedure in which participants articulate responses to recorded scenarios, and has been used previously to study partner aggression (e.g., Eckhardt, 2007). The ATSS has several advantages over more traditional questionnaire approaches including a nearly real-time assessment of cognitions while reducing interference with the listening task (Davison, Vogel, & Coffman, 1997), and the lack of constraint to specific predetermined responses (Davison et al., 1983; Merluzzi, Rudy, & Glass, 1981).

In the present study, the stimuli were administered immediately following the initial BrAC reading to ensure completion on the ascending limb of the BAC curve which is associated with the stimulant effects of alcohol and increased likelihood of aggression relative to the descending limb (Giancola & Zeichner, 1997; Holdstock & de Wit, 1998). A neutral

scenario was presented first and depicted a dating couple returning home from a party and having an ordinary conversation about what happened at the party as well as their upcoming plans. The conflict scenario was presented next and depicted a jealous interaction between dating partners that had just returned home from a party and were upset with each other about their behavior at the party. The conflict involved mutual aggression in which both partners engaged in a mild disagreement that escalated in intensity to a verbal argument and then to mild physical aggression. Participants were instructed to project themselves in to the situation as if these interactions were actually happening between them and their dating partner. Both scenarios were presented in eight discrete 30-second segments with 30-seconds in between. For each audio segment, participants were instructed to "Please respond out loud with your thoughts, feelings, and what you would do in response to the portion of the scenario you just heard." Participants were provided several practice trials in the presence of a research assistant to ensure proficiency with these procedures, but they completed the test scenarios in private. Participants' verbatim responses were recorded and later transcribed.

The conflict scenario was pilot-tested prior to its use in this study. Same-sex focus groups (N = 18; 56% female) were facilitated by the first author and a trained research assistant. Participants first listened to an initial audio recording of the conflict scenario in separate private rooms and then were provided with a written transcript of the scenario for reference and as a group were asked to discuss the realism, credibility, and the appropriateness of the scenario's content for individuals their age (e.g., 21–30). The scenario was modified based on this detailed feedback and then professional actors were hired and recordings were made in a state-of-the-art recording studio. Sound effects were added by a professional sound technician to reflect the use of physical aggression and breaking objects that enhanced the realism and credibility of the scenario. After the final recording was produced, the construct validity of the conflict scenario was examined by recruiting dating men and women with past-year dating aggression (n = 31; 48% female) and those with no such history (n = 30; 53% female) using procedures identical to that of the main study described above. The conflict scenario demonstrated construct validity as more aggressive responses were provided from individuals known to have a history of dating aggression within the past year than those without a history of dating aggression.

Positive mood manipulation and debriefing—Prior to leaving the lab, participants viewed a 10-minute video clip of a popular comedy television series to ensure that they did not leave feeling distressed after exposure to the conflict scenario (Ciarrochi & Forgas, 2000). Following the video, participants were debriefed regarding their true beverage condition and BrACs (for those in the alcohol or placebo conditions), and were provided a list of resources for dating aggression and alcohol treatment. Participants in the alcohol condition remained in the laboratory until their BrACs were below .02% and they showed no evidence of behavioral impairment (NIAAA, 2005). They were compensated $5/hour toward a maximum of $40, or were given an introductory psychology research credit per hour in the lab.

Measures and Instruments

Demographics—Participants reported their age, gender, ethnicity, and annual household income. They were also asked the status of their relationship (not dating, dating, but not exclusively, dating exclusively, engaged, and married), and length of time in current relationship (measured in months).

Subjective emotional arousal—Subjective emotional arousal was assessed throughout the presentation of the audio-taped stimuli using a procedure established for subjective ratings of sexual arousal (Rellini, McCall, Randall, & Meston, 2005). Participants controlled a computer optical mouse, the placement of which was associated with a meter displayed on the computer screen that ranged from 0 = *no emotional arousal* to 1 = *extreme emotional arousal*. Participants were instructed to move the mouse forward or backward to indicate their level of emotional arousal (and therefore reflected changes in their emotional arousal) while listening to the scenarios. Their ratings were recorded every 0.5 seconds and then averaged across each scenario.

Emotion regulation—We used the 10-item Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), which consists of two subscales: Reappraisal (e.g., I control my emotions by changing the way I think about the situation I'm in) and Suppression (e.g., I control my emotions by not expressing them). Items have 7-point response scales (1 = strongly disagree; 4 = neutral; 7 = strongly agree), and internal consistency was good for both the Reappraisal and Suppression subscales (Cronbach's alphas of .78 and .75, respectively).

Aggression intentions—Each participant's articulated responses to the scenarios were coded by two research assistants who received approximately 20 hours of training with the first author on a coding manual developed for similar research (Eckhardt et al., 2002). The coders were blind to the participants' condition. Participants' statements were coded as verbal aggression intentions if the participant insulted or demeaned a character in the scenario or indicated an intention to do the same to their own dating partner. Physical aggression intentions were coded as statements that expressed a desire to physically hurt a character in the scenario or their partner. Intraclass correlation coefficients indicated good consistency between the coders for verbal (r_{icc} = .85) and physical (r_{icc} = .95) aggression intentions. Due to low rates of physical aggression intentions and consistent with similar research using the ATSS procedures to assess aggression intentions (e.g., Eckhardt et al., 2002), tallies of verbal and physical aggression intentions were summed for a total aggression intention score for each scenario.

Manipulation checks—Participants were asked to estimate the number of standard alcohol beverages (defined as 1.5 ounces of liquor) they were served (Fromme, Katz, & D'Amico, 1997). A revised version of the Profile of Mood States (POMS; Gabrielli, Nagoshi, Rhea, Wilson, 1991) was administered and included 7 items to assess feelings of intoxication (e.g., flushing, nausea), and neurological effects of alcohol (e.g., off-balance). These items were rated on 5-point scales (1 = not at all; 5 = extremely), were summed to create both subscales, and had acceptable to strong inter-item reliabilities (Cronbach's

alphas .62 and .92, respectively). After watching the comedy clip, participants also rated their mood using 6-point scales anchored by word pairs (e.g., 1 = very calm; 3 = neither calm nor angry; 6 = very angry) to ensure the effectiveness of the positive mood manipulation (e.g., Forgas, 2002).

Data Analytic Strategy

Participants' subjective emotional arousal ratings were examined for compliance with the procedures prior to calculating an overall average for both scenarios. When the peak arousal rating for one segment of the scenario equaled 0, that indicated that the participant had not moved the mouse from the starting position during that 30-second segment and those observations were removed. For the neutral scenario, the observations of 144 segments (12.5% of all possible segments) from 66 participants were removed, whereas for the conflict scenario observations of 54 segments (4.7% of all segments) from 33 participants were removed.

Aggression intentions were modeled using a negative binomial distribution with a log link function as these represent count data with a positively skewed distribution (i.e., the majority of responses were concentrated at the lower end of the scale) and a variance greater than the mean. Negative binomial regression analyses provide exponentiated regression coefficients or incidence rate ratios (IRRs). which serve as a standardized effect size. IRRs reflect the percentage increase in the rate with which aggressive intentions were articulated as a function of another variable (e.g., alcohol intoxication, emotion regulation) while holding all other variables in the model constant. All analyses with aggression intentions as the dependent variable included the total aggression intentions to the neutral scenario as a covariate in the equation to control for baseline aggression intentions. Similarly, analyses examining the effects of participants' emotional arousal to the conflict scenario also included emotional arousal to the neutral scenario as a covariate to control for their baseline arousal.

Results

One participant in the placebo condition was excluded from analyses because she did not believe she consumed alcohol, and 5 participants randomized to the alcohol condition were excluded from analyses because they reached pharmacologically insufficient peak BrACs at or below .06% ($n = 4$) or they admitted to not being in a relationship after their participation was completed ($n = 1$). Therefore, the final sample consisted of 144 participants with 48 (50% female) in the alcohol condition, 48 (52% female) in the placebo condition, and 48 (50% female) in the no alcohol condition.

Demographic characteristics between those randomized to the alcohol, placebo, and no alcohol conditions were examined, and only ethnicity differed across conditions, $\chi^2(10, N = 144) = 19.51$, $p < .05$, with more White participants randomized to the alcohol condition than to the no alcohol or placebo conditions. Participants' age, the length of time in their current relationship, typical weekly alcohol consumption, and emotion regulation did not differ across conditions (p's > .05). Separate ANOVAs assessed differences across conditions on the POMS subscales and the estimated number of standard drinks consumed.

As shown in Table 1, those in the alcohol condition reported feeling more intoxicated, had more neurological effects, and reported consuming more standard drinks than those in the placebo and no alcohol conditions (all *p*'s < .001). In addition, those in the placebo condition reported greater intoxication, more neurological effects, and believed they were served more drinks than those in the no alcohol condition (all *p*'s < .001). Taken together, these results suggest that the placebo manipulation was partially successful.

The Effects of Alcohol on Verbal and Physical Aggression Intentions

Participants reached an average peak BrAC of 0.082% (*SD* = 0.01), with no significant differences between the peak BrAC of women (*M* = 0.084, *SD* = 0.01) compared to men (*M* = 0.079, *SD* = 0.01), $t(46) = 1.84$, $p = .07$, effect size = .26. Men (*M* = 2.11, *SD* = 3.23) and women (*M* = 2.66, *SD* = 4.74) also did not differ on their aggression intentions to the conflict scenario, $t(142) = 0.80$, $p = .42$, effect size = .07, and therefore gender was not included in the final models. A negative binomial regression controlling for aggression intentions to the neutral scenario revealed a significant difference between the alcohol and no alcohol conditions, $b = 0.64$, $p < .05$, IRR = 1.89 (95% Confidence Interval [C.I.]): 1.09, 3.28). Those in the alcohol condition expressed aggression intentions at a rate 1.89 times greater than those in the no alcohol condition (Table 1). There was no significant difference between participants in the placebo and no alcohol conditions, $b = 0.21$, $p = .47$, IRR = 1.24 (95% C.I.: 0.70, 2.17). Next, we ran a similar negative binomial regression analysis with the alcohol condition as the reference. The placebo condition did not significantly differ from the alcohol condition on aggression intentions to the conflict scenario, $b = -0.42$, $p = .13$, IRR = 0.65 (95% C.I.: 0.38, 1.13). Overall, there was no effect of placebo as it was not significantly different from either the alcohol or no alcohol conditions.

Alcohol Intoxication and Emotion-Regulation

Using the no alcohol condition as the reference, a negative binomial regression was conducted to examine the effects of beverage condition and emotion-regulation on aggression intentions. This analysis included the main effects of beverage conditions, emotion regulation subscales Reappraisal and Suppression, and the two-way interactions among beverage condition, Reappraisal, and Suppression (Table 2). There were significant main effects of alcohol condition and Reappraisal that were superseded by significant interactions between alcohol condition and Reappraisal, and between the placebo condition and Reappraisal.[1] As shown in Figure 1, among individuals less able to reappraise, those who were intoxicated articulated more aggression intentions than those in the placebo and no alcohol conditions. Among those better able to reappraise, however, individuals in the no alcohol condition articulated more aggression intentions than those who received alcohol and placebo. Neither the main effect of Suppression nor the interactions between Suppression and beverage conditions were significant.

[1]For all significant interactions, the influence of possible outliers was examined to determine whether the results were influenced by the responses of only a few participants by examining the leverage statistic for negative binomial regression analyses. Data points with a leverage score ≥ 0.5 were removed and the analysis rerun. Results did not change, suggesting that the possible outliers did not exert undue influence on the significant results.

Emotion-Regulation and Emotional Arousal

A negative binomial regression analysis was conducted for aggression intentions with Reappraisal, Suppression, emotional arousal, and the two-way interactions entered as independent variables (Table 3). There were significant main effects of aggression intentions to the neutral scenario and emotional arousal as well as a significant main effect of Suppression that was superseded by a significant interaction between Suppression and emotional arousal to the conflict scenario. As shown in Figure 2, at lower levels of Suppression, individuals who experienced greater emotional arousal articulated more verbal aggression intentions compared to those with lower emotional arousal. At higher levels of Suppression, however, individuals with higher arousal articulated less verbal aggression intentions than those with lower arousal. There was also a significant interaction between Suppression and Reappraisal. Neither the main effect of Reappraisal nor the interaction between Reappraisal and emotional arousal were significant.

Discussion

The current investigation provided an initial examination of the effects of alcohol intoxication, alcohol expectancy, emotion regulation, and emotional arousal on the verbal and physical aggression intentions of men and women. Consistent with survey studies that find that women engage in dating aggression at similar rates as men (Katz et al., 2002), we observed no sex differences in verbal and physical aggression intentions. Experimental studies using similar methodology to the current investigation have also failed to find effects of sex on aggression intentions (e.g., Eckhardt & Crane, 2008), whereas experimental studies using different methodologies to assess aggression (e.g., the Taylor Aggression Paradigm, TAP; Giancola, 2006; Giancola et al., 2002) have found women to be less aggressive than men. The current methodology may have greater validity among women as it involved mutual relationship aggression as opposed to the TAP that involves the administration of electric shocks to a fictitious competitor. Together these findings indicate that inferences about sex differences in aggression must be considered in terms of the methodologies used and the types of aggression that are measured.

We found that the verbal and physical aggression intentions of those who received alcohol were significantly greater than those who did not expect or receive alcohol, and there were no differences between those who received alcohol and those who expected but did not receive alcohol. These results suggest that the pharmacological effects of alcohol were important in predicting overall differences in verbal and physical aggression intentions. Consequently results can be interpreted as being consistent with alcohol myopia theory in that alcohol intoxication may have narrowed participants' attention to the instigating cues depicted in the conflict scenario and away from other inhibitory cues thus leading to greater intentions to aggress. Alcohol may also have served to disinhibit aggressive behavior in response to the conflict scenario, especially because assessments were taken on the ascending limb of the BAC curve. The ascending limb is associated with the stimulant effects of alcohol and has been associated with increased aggression in the TAP relative to the descending limb, which is associated with the sedative effects of alcohol (Giancola & Zeichner, 1997; Holdstock & de Wit, 1998). Thus, both alcohol-impaired attentional

processes and the disinhibiting effects of alcohol likely influenced participants' aggression intentions.

The effects of alcohol expectancies on verbal and physical aggression intentions were less clear. We cannot disentangle the pharmacological from the expectancy effects of alcohol in the current study because participants who received alcohol were also told they would receive alcohol which activated their alcohol expectancies. An anti-placebo condition (i.e., told no alcohol/receive alcohol) would have allowed us to test the pharmacological effects of alcohol in the absence of expectancies, but we did not include this condition because our target dose exceeded the level at which the anti-placebo can be effectively achieved (Sayette, Breslin, Wilson, & Rosenblum, 1994). Additionally, we did not find a significant difference between the placebo condition (which represents a pure assessment of expectancies) and either the alcohol or no alcohol conditions on verbal and physical aggression intentions, suggesting that expectancies did not contribute to aggression intentions in the absence of alcohol's pharmacological effects. We should also note that participants in placebo conditions can typically be led to expect only low doses of alcohol (Martin, Earlywine, Finn, & Young, 1990; Martin & Sayette, 1993). Therefore, we attempted to increase the credibility of our placebo manipulation by providing participants in the alcohol and placebo conditions with false visual feedback indicating a BrAC of .04%, which was lower than the target dose of .08% in the alcohol condition. Despite this, however, our placebo manipulation was only partially successful with participants in the placebo condition believing they consumed fewer drinks and reporting weaker feelings of intoxication than those who received alcohol. It is possible that this difference in perceived intoxication limited our ability to observe significant differences between the placebo and no alcohol conditions. Future research should continue to examine the influence of alcohol's pharmacological versus expectancy effects on dating aggression including the use of a balanced placebo design and an examination of alcohol's biphasic effects.

The Role of Emotion Regulation in Verbal and Physical Aggression

As hypothesized, among those less able to engage in cognitive reappraisal, individuals who consumed alcohol or believed they consumed alcohol expressed more verbal and physical aggression intentions than those who received no alcohol. This pattern reversed for those better able to engage in reappraisal as those who expected or received alcohol articulated fewer verbal and physical aggression intentions than those who received no alcohol. These findings are not altogether surprising. Those who expected to consume alcohol (whether or not they actually did) may have been more vigilant to emotional cues that required their use of reappraisal skills to compensate for the expected impairing effects of alcohol (e.g., Testa et al., 2006). Conversely, individuals with good appraisal skills who did not expect or receive alcohol may not have perceived the need to actively engage their self-regulatory skills. Although the differential use of appraisal skills to cope with aggressive impulses is plausible, we did not assess whether participants used any regulatory techniques while listening to the scenarios, which should be done in future research.

As anticipated, individuals who had lower abilities to suppress their emotions and who experienced greater emotional arousal expressed more verbal and physical aggression

intentions compared to those who experienced less emotional arousal. For individuals better able to suppress their emotions the relation reversed, as those who experienced higher arousal articulated less verbal and physical aggression intentions than those with lower emotional arousal. These effects were independent of beverage consumed, suggesting that emotional arousal alone may have served as a cue to engage in emotional suppression. Therefore, individuals who were highly aroused may have worked harder at suppressing their emotions thereby expressing less verbal and physical aggression intentions.

Current results suggest that alcohol intoxication increases verbal and physical aggression intentions and that there are different circumstances in which regulatory approaches may be relatively more effective at decreasing aggression. When an individual's expectancies were primed through the administration of either alcohol or placebo, cognitive reappraisal was associated with lower behavioral intentions to act aggressively. In the absence of alcohol cues, emotional arousal and a greater ability to suppress emotions were associated with lower verbal and physical aggression intentions. Results therefore suggest that different regulatory strategies may be recruited whenever one has or has not been drinking. Whereas the current study elicited alcohol expectancies, emotional arousal, and regulatory strategies in a controlled laboratory experiment, these processes may be even stronger in naturalistic settings such as in an actual bar or during a conflict with a dating partner.

Clinical Implications

The current results provide important implications for interventions that target dating aggression and alcohol use. Because aggression and alcohol use often co-occur and the pharmacological effects of alcohol influence the occurrence of aggression, efforts aimed at reducing the risk for dating aggression should also address the individual's alcohol consumption. Initial research suggests that reducing drinking may lead to a decrease in partner aggression even when the treatment does not directly target aggressive behavior (O'Farrell, Fals-Stewart, Murphy, & Murphy, 2003). Following the common treatment protocol for individuals in aggressive relationships, every effort should be made for the individual to remove himself or herself from a conflict with their partner especially if there is a history of aggression or the individual is concerned that they or their partner may become aggressive (e.g., McFarlane et al., 2004). When leaving the situation is not possible, or a pattern of aggression has not been established but there is a high level of distress related to dating conflict, individuals need the tools and techniques to effectively manage strong negative emotions.

Interventions should help individuals build self-regulatory techniques, including cognitive reappraisal and emotion suppression, to better handle their emotional response to relationship conflict and decrease the likelihood of aggression. For example, learning to restructure one's cognitions regarding the circumstances around the conflict (e.g., alcohol expectancies, feelings of jealousy) may help assuage the likelihood of negative consequences especially after one's alcohol expectancies have been primed. Additionally, practicing behavioral approaches to manage one's strong negative emotions, such as self-imposed time-outs or engaging in a stress relieving activity (e.g., exercise), may have beneficial effects on the adjustment of dating relationships and serve to decrease aggression.

Although more research is needed, current findings suggest that regulatory techniques may be more or less effective depending on an individual's external situation (e.g., intoxication) or internal emotional state. When thoughts and beliefs about the likelihood of aggression in a given circumstance are salient, including when alcohol has been consumed, cognitive reappraisal may be beneficial. Emotion suppression may be a more useful regulatory technique for responding to conflict in the moment when emotional arousal is high as it involves an immediate modification of one's emotional experience to an emotionally provoking situation (John & Gross, 2004). Having the ability to engage in both cognitive reappraisal and emotion suppression techniques would allow for flexibility so that individuals can engage in the process best suited to them or the particular circumstance.

As important as it is to teach regulatory strategies, it is also necessary to be aware of the limitations of these strategies. For example, there is evidence to suggest that engaging in emotion suppression continually over time may lead to a depletion of regulatory resources (Muraven, Tice, & Baumeister, 1998), which may subsequently increase the likelihood of aggression. These strategies should therefore be seen as temporary solutions and used to help individuals remove or disengage themselves from the conflict at hand. Once the conflict or emotionally laden situation has abated, the individual should then be encouraged to address the problem in a more direct or permanent manner.

Limitations and Conclusions

Three limitations relate to our alcohol challenge procedures. First because we did not employ a full balanced placebo design, and because our placebo manipulation was only partially successful, we could not completely disentangle the pharmacological from expectancy effects of alcohol. Although we demonstrated that alcohol intoxication contributed to aggressive intentions, we cannot say whether expectancies also played a role. Second we used a single target dose of alcohol selected because it had previously been effective in eliciting physical aggression with the TAP. This choice precluded us from determining the possible effects of different levels of intoxication on intentions to aggress in a dating situation, which should be examined in future research. Third, all of our assessments occurred on the ascending limb of the BAC curve when stimulant effects of intoxication are dominant. Because dating aggression could occur at any time during a drinking event, future studies should also examine intentions on the descending limb of the BAC curve, when sedative effects dominate.

Only a single assessment of emotion regulation was used in this investigation, therefore the extent to which individuals employed reappraisal or suppression strategies throughout the presentation of the conflict scenario was not assessed. Continuous real-time assessments of attempts to self-regulate throughout exposure to an emotionally arousing conflict scenario would provide a more comprehensive understanding of the moment-to-moment changes in self-regulatory processes as individuals cope with dating conflict. In addition, we used a general measure of emotional arousal, which could have been more strongly influenced by the stimulant effects of intoxication (for those who received alcohol) than by the emotional salience of the aggressive stimuli. Because anger has been implicated in the occurrence of partner aggression (Berkowitz, 1993; Holtzworth-Munroe & Clements, 2007), future

investigations should examine the specific effects of anger, and other discrete emotions, rather than general arousal on dating aggression. Lastly, due to the limitations of experimental investigations, we assessed intentions to act aggressively rather than actual aggressive behavior. According to the theory of planned behavior and theory of reasoned action (Ajzen, 1991; Ajzen & Fishbein, 1980), behavioral intentions often serve as a proxy for actual behavior. Lending credibility to the assessment of aggression intentions to approximate actual behavior, our pilot testing confirmed that individuals with a history of dating aggression articulated more verbal and physical aggression intentions to the conflict scenario than those with no such history.

Limitations notwithstanding, the current study furthered the understanding of the association between alcohol and aggression among both men and women in dating relationships. Although the effects of alcohol expectancies cannot be ruled out entirely, stronger support was found for the pharmacological effects of alcohol on verbal and physical aggression intentions. We also found that emotion regulation was related to verbal and physical aggression intentions, with the techniques of cognitive reappraisal and emotion suppression effective in response to different circumstances and internal states. These findings are important in light of the high prevalence with which dating aggression occurs. Strategies to increase both partner's abilities to regulate their emotions should be considered in conjunction with interventions to reduce alcohol consumption as the combination of these approaches are likely to be complimentary and have benefits above and beyond those related to decreasing dating aggression.

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References

Ajzen I. The theory of planned behavior. Organizational Behavior and Human Decision Processes. 1991; 50:179–211.

Ajzen, I.; Fishbein, M. Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall; 1980.

Barbour K, Eckhardt C, Davison G, Kassinove H. The experience and expression of anger in martially violent and nonviolent men. Behavior Therapy. 1998; 29:173–191.

Baumeister, RF.; Heatherton, TF.; Tice, DM. Losing Control: How and Why People Fail at Self-Regulation. San Diego, CA: Academic Press; 1994.

Berkowitz, L. Towards a general theory of anger and emotional aggression: Implications of the cognitive neoassociationistic perspective for the analysis of anger and other emotions. In: Wyer, RS.; Srull, TK., editors. Perspectives on Anger and Emotion. Advances in Social Cognition. Vol. Vol 6. Hillsdale, NJ: Lawrence Earlbaum Associates; 1993. p. 1-46.

Bond A, Lader M. A method to elicit aggressive feelings and behavior via provocation. Biological Psychology. 1986; 22:69–79. [PubMed: 3697459]

Bushman BJ, Cooper HM. Effects of alcohol on human aggression: An integrative research review. Psychological Bulletin. 1990; 107:341–354. [PubMed: 2140902]

Ciarrochi J, Forgas JP. The pleasure of possessions: affective influences and personality in the evaluation of consumer items. European Journal of Social Psychology. 2000; 30:631–649.

Curtin JJ, Fairchild BA. Alcohol and cognitive control: Implications for regulation of behavior during response conflict. Journal of Abnormal Psychology. 2003; 112:424–436. [PubMed: 12943021]

Curtin JJ, Patrick CJ, Lang AR, Cacioppo JT, Birbaumer N. Alcohol affects emotion through cognition. Psychological Science. 2001; 12:527–531. [PubMed: 11760143]

Davison GC, Robins C, Johnson MK. Articulated Thoughts During Simulated Situations: A Paradigm for Studying Cognition in Emotion and Behavior. Cognitive Therapy and Research. 1983; 7:17–40.

Davison GC, Vogel RS, Coffman SG. Think-aloud approaches to cognitive assessment and the articulated thoughts in simulated situations paradigm. Journal of Consulting and Clinical Psychology. 1997; 65:950–958. [PubMed: 9420356]

Dermen KH, Cooper ML. Inhibition conflict and alcohol expectancy as moderators of alcohol's relationship to condom use. Experimental and Clinical Psychopharmacology. 2000; 8:198–206. [PubMed: 10843303]

Dermen KH, George WH. Alcohol expectancy and the relationship between drinking and physical aggression. Journal of Psychology: Interdisciplinary and Applied. 1989; 123:153–161. [PubMed: 2724174]

DeWall CN, Baumeister RF, Stillman TF, Gailliot MT. Violence restrained: Effects of self-regulation and its depletion on aggression. Journal of Experimental Social Psychology. 2007; 43:62–76.

Duke AA, Giancola PR, Morris DH, Holt JCD, Gunn RL. Alcohol dose and aggression: Another reason why drinking more is a bad idea. Journal of Studies on Alcohol and Drugs. 2011; 72:34–43. [PubMed: 21138709]

Dye ML, Eckhardt CI. Anger, irrational beliefs, and dysfunctional attitudes in violent dating relationships. Violence and Victims. 2000; 15:337–350. [PubMed: 11200106]

Eckhardt CI. Effects of alcohol intoxication on anger experience and expression among partner assaultive men. Journal of Consulting and Clinical Psychology. 2007; 75:61–71. [PubMed: 17295564]

Eckhardt CI, Barbour KA, Davison GC. Articulated thoughts of martially violent and nonviolent men during anger arousal. Journal of Consulting and Clinical Psychology. 1998; 66:259–269. [PubMed: 9583329]

Eckhardt CI, Barbour KA, Stuart GL. Anger and hostility in maritally violent men: Conceptual distinctions, measurement issues, and literature review. Clinical Psychology Review. 1997; 17:333–358. [PubMed: 9199856]

Eckhardt CI, Crane C. Effects of alcohol intoxication and aggressivity on aggressive verbalizations during anger arousal. Aggressive Behavior. 2008; 34:428–436. [PubMed: 18307248]

Eckhardt C, Jamison TR, Watts K. Anger experience and expression among male dating violence perpetrators during anger arousal. Journal of Interpersonal Violence. 2002; 17:1102–1114.

Forgas JP. Feeling and doing: Affective influences on interpersonal behavior. Psychological Inquiry. 2002; 13:1–28.

Fromme K, Katz EC, D'Amico EJ. Effects of alcohol intoxication on the perceived consequences of risk taking. Experimental and Clinical Psychopharmacology. 1997; 5:14–23. [PubMed: 9234035]

Gabrielli WF, Nagoshi CT, Rhea SA, Wilson JR. Anticipated and subjective sensitivities to alcohol. Journal of Studies on Alcohol. 1991; 52:205–214. [PubMed: 2046370]

Giancola PR. Executive functioning: A conceptual framework for alcohol-related aggression. Experimental and Clinical Psychopharmacology. 2000; 8:576–594. [PubMed: 11127429]

Giancola PR. Influence of subjective intoxication, breath alcohol concentration, and expectancies on the alcohol-aggression relation. Alcoholism: Clinical and Experimental Research. 2006; 30:844–850.

Giancola PR, Helton EL, Osborne AB, Terry MK, Fuss AM, Westerfield JA. The effects of alcohol and provocation on aggressive behavior in men and women. Journal of Studies on Alcohol. 2002; 63:64–73. [PubMed: 11925061]

Giancola PR, Zeichner A. The biphasic effects of alcohol on human physical aggression. Journal of Abnormal Psychology. 1997; 106:598–607. [PubMed: 9358690]

Goldsmith HH, Davidson RJ. Disambiguating the components of emotion regulation. Child Development. 2004; 75:361–365. [PubMed: 15056191]

Gray HM, Foshee V. Adolescent dating violence: Differences between one-sided and mutually violence profiles. Journal of Interpersonal Violence. 1997; 12:126–141.

Gross JJ. Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. Journal of Personality and Social Psychology. 1998; 74:224–237. [PubMed: 9457784]

Gross JJ. Emotion regulation: Past, present, future. Cognition and Emotion. 1999; 13:551–573.

Gross JJ, John OP. Individual differences in two emotion regulation processes: Implications for affect, relationships and well-being. Journal of Personality and Social Psychology. 2003; 85:348–362. [PubMed: 12916575]

Hendershot CS, Stoner SA, George WH, Norris J. Alcohol use, expectancies and sexual sensation seeking as correlates of HIV risk behavior in heterosexual young adults. Psychology of Addictive Behaviors. 2007; 21:365–372. [PubMed: 17874887]

Holdstock L, de Wit H. Individual differences in the biphasic effects of ethanol. Alcoholism: Clinical and Experimental Research. 1998; 22:1903–1922.

Holtzworth-Munroe, A.; Clements, K. The association between anger and male perpetration of intimate-partner violence. In: Cavell, TA.; Malcolm, KT., editors. Anger, Aggression, and Interventions for Interpersonal Violence. Mahwah, NJ: Lawrence Erlbaum Associates; 2007.

John OP, Gross JJ. Health and unhealthy emotion regulation: Personality processes, individual differences and life span development. Journal of Personality. 2004; 72:1301–1334. [PubMed: 15509284]

Johnson MP. Patriarchal terrorism and common couple violence: Two forms of violence against women. Journal of Marriage and the Family. 1995; 57:283–294.

Katz J, Kuffel SW, Coblentz A. Are there gender differences in sustaining dating violence? An examination of frequency, severity, and relationship satisfaction. Journal of Family Violence. 2002; 17:247–271.

Leonard KE, Quigley BM. Drinking and marital aggression in newlyweds: An event-based analysis of drinking and the occurrence of husband marital aggression. Journal of Studies on Alcohol. 1999; 60:537–545. [PubMed: 10463811]

Leonard KE, Senchak M. Alcohol and premarital aggression among newlywed couples. Journal of Studies on Alcohol. 1993; (Suppl. 11):96–108.

Lundeberg K, Stith SM, Penn CE, Ward DB. A comparison of nonviolent, psychologically violent, and physically violent male college daters. Journal of Interpersonal Violence. 2004; 19:1191–1200. [PubMed: 15358942]

Maisto SA, Carey MP, Carey KB, Gordon CM. The effects of alcohol and expectancies on risk perception and behavioral skills relevant to safer sex among heterosexual young adult women. Journal of Studies on Alcohol. 2002; 63:476–485. [PubMed: 12160107]

Martin C, Earlywine M, Finn P, Young R. Some boundary conditions for the effective use of alcohol placebos. Journal of Studies on Alcohol. 1990; 51:500–515. [PubMed: 2270058]

Martin C, Sayette MA. Experimental design in alcohol administration research: Limitations and alternatives in the manipulation of dosage-set. Journal of Studies on Alcohol. 1993; 54:750–761. [PubMed: 8271813]

McFarlane J, Malecha A, Gist J, Watson K, Batten E, Hall I, Smith S. Increasing the safety-promoting behaviors of abused women. American Journal of Nursing. 2004; 104(3):40–50. [PubMed: 15108570]

Merluzzi, TV.; Rudy, TE.; Glass, CR. The information processing paradigm: Implications for clinical science. In: Merluzzi, TV.; Glass, CR.; Genest, M., editors. Cognitive assessment. New York: Guilford Press; 1981. p. 77-124.

Muraven M, Baumeister RF. Self-regulation and depletion of limited resources: Does self-control resemble a muscle? Psychological Bulletin. 2000; 126:247–259. [PubMed: 10748642]

Muraven M, Tice DM, Baumeister RF. Self-Control as limited resource: Regulatory depletion patterns. Journal of Personality and Social Psychology. 1998; 74:774–789. [PubMed: 9523419]

National Institute on Alcohol Abuse and Alcoholism. Recommended Council Guidelines on Ethyl Alcohol Administration in Human Experimentation. Rockville, MD: Department of Health and Human Services; 2005.

Norris J, Kerr KL. Alcohol and violent pornography: Responses to permissive and nonpermissive cues. Journal of Studies on Alcohol. 1993; 11:118–127.

O'Farrell TJ, Fals-Stewart W, Murphy M, Murphy CM. Partner violence before and after individually based alcoholism treatment for male alcoholic patients. Journal of Consulting and Clinical Psychology. 2003; 71:92–102. [PubMed: 12602429]

Quigley BM, Leonard KE. Husband alcohol expectancies, drinking, and marital-conflict styles as predictors of severe marital violence among newlywed couples. Psychology of Addictive Behaviors. 1999; 13:49–59.

Rellini AH, McCall KM, Randall PK, Meston CM. The relationship between women's subjective and physiological sexual arousal. Psychophysiology. 2005; 42:116–124. [PubMed: 15720587]

Riggs D, O'Leary KD, Breslin F. Multiple predictors of physical aggression in dating couples. Journal of Interpersonal Violence. 1990; 5:61–73.

Rohsenow DJ, Marlatt AG. The balanced placebo design: Methodological considerations. Addictive Behaviors. 1981; 6:107–122. [PubMed: 7023202]

Sayette MA, Breslin FC, Wilson GT, Rosenblum GD. An evaluation of the balanced placebo design in alcohol administration research. Addictive Behaviors. 1994; 19:333–342. [PubMed: 7942250]

Schumacher JA, Feldbau-Kohn S, Slep AMS, Heyman RE. Risk factors for male-to-female partner physical abuse. Aggression and Violent Behavior. 2001; 6:281–352.

Shook NJ, Gerrity DA, Jurich J, Segrist AE. Courtship violence among college students: A comparison of verbally and physically abusive couples. Journal of Family Violence. 2000; 15:1–22.

Sillars, A.; Roberts, LJ.; Dun, T.; Leonard, K. Stepping into the stream of thought: Cognition during marital conflict. In: Manusov, V.; Harvey, J., editors. Attribution, Communication Behavior, and Close Relationships. New York, NY: Cambridge University Press; 2002. p. 193-210.

Steele CM, Josephs RA. Alcohol Myopia: Its prized and dangerous effects. The American Psychologist. 1990; 45:921–933. [PubMed: 2221564]

Stucke TS, Baumeister RF. Ego depletion and aggressive behavior: Is the inhibition of aggression a limited resource? European Journal of Social Psychology. 2006; 36:1–13.

Taylor, SP.; Leonard, KE. Alcohol and human aggression. In: Green, RG.; Donnerstein, EI., editors. Aggression: Theoretical and empirical reviews. New York: Academic Press; 1983. p. 77-102.

Testa M, Fillmore MT, Norris J, Abbey A, Curtin JJ, Leonard KE, …Hayman LW. Understanding alcohol expectancy effects: Revisiting the placebo condition. Alcoholism: Clinical and Experimental Research. 2006; 30:339–328.

Tice DM, Bratslavsky E, Baumeister RF. Emotional distress regulation takes precedence over impulse control: If you feel bad, do it! Journal of Personality and Social Psychology. 2001; 80:53–67. [PubMed: 11195891]

White J, Koss M. Courtship violence: Incidence in a national sample of higher education students. Violence and Victims. 1991; 6:247–256. [PubMed: 1822695]

Wells S, Mihic L, Tremblay PF, Graham K, Demers A. Where, with whom, and how much alcohol is consumed on drinking events involving aggression? Event-level associations in a Canadian National Survey of university students. Alcoholism: Clinical & Experimental Research. 2008; 32:522–533.

Whitaker DJ, Haileyesus T, Swahn M, Saltzman LS. Differences in frequency of violence and reported injury between relationships with reciprocal and nonreciprocal intimate partner violence. American Journal of Public Health. 2007; 97:941–947. [PubMed: 17395835]

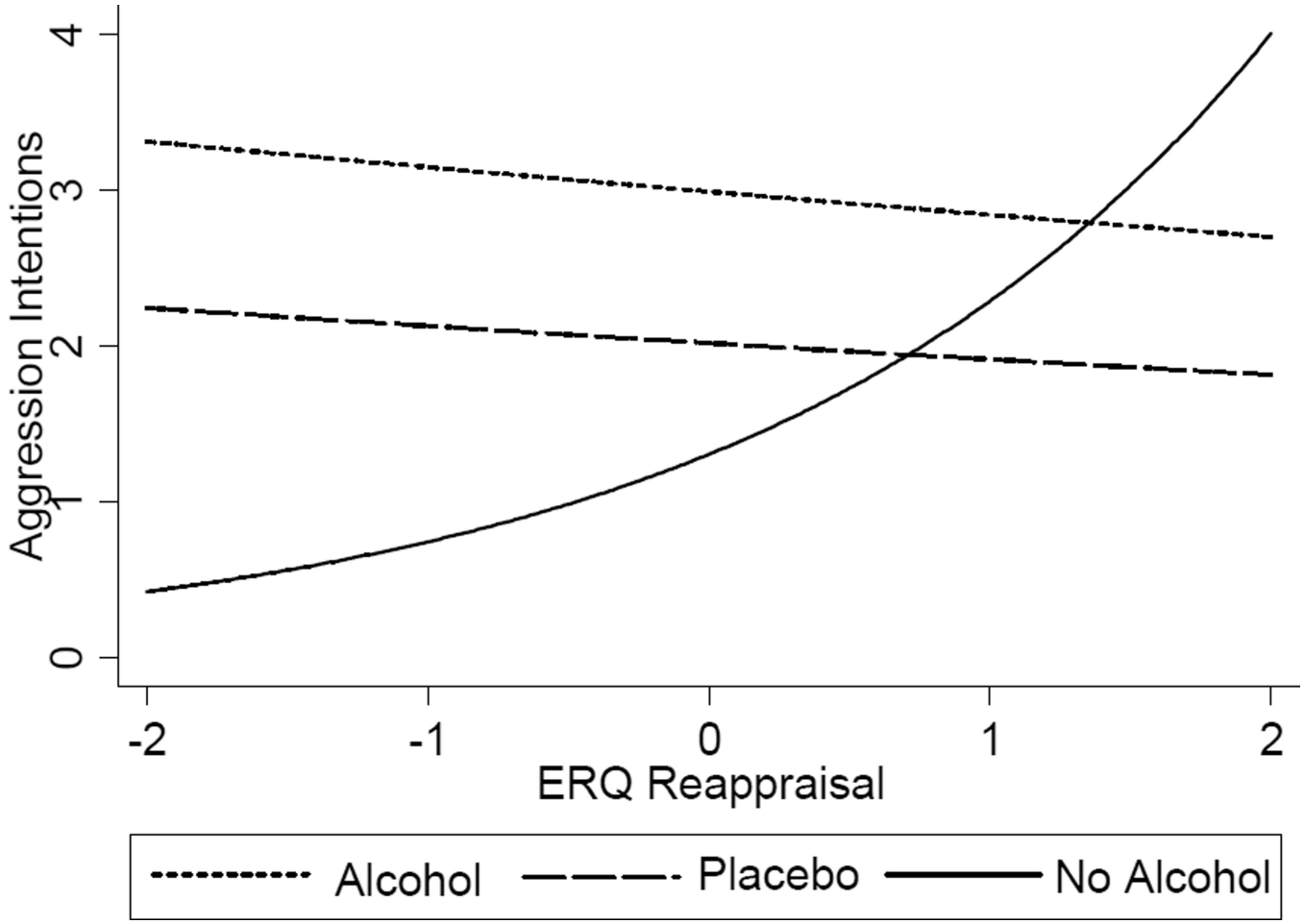

Figure 1.
Beverage condition and cognitive reappraisal interact to predict aggression intentions.

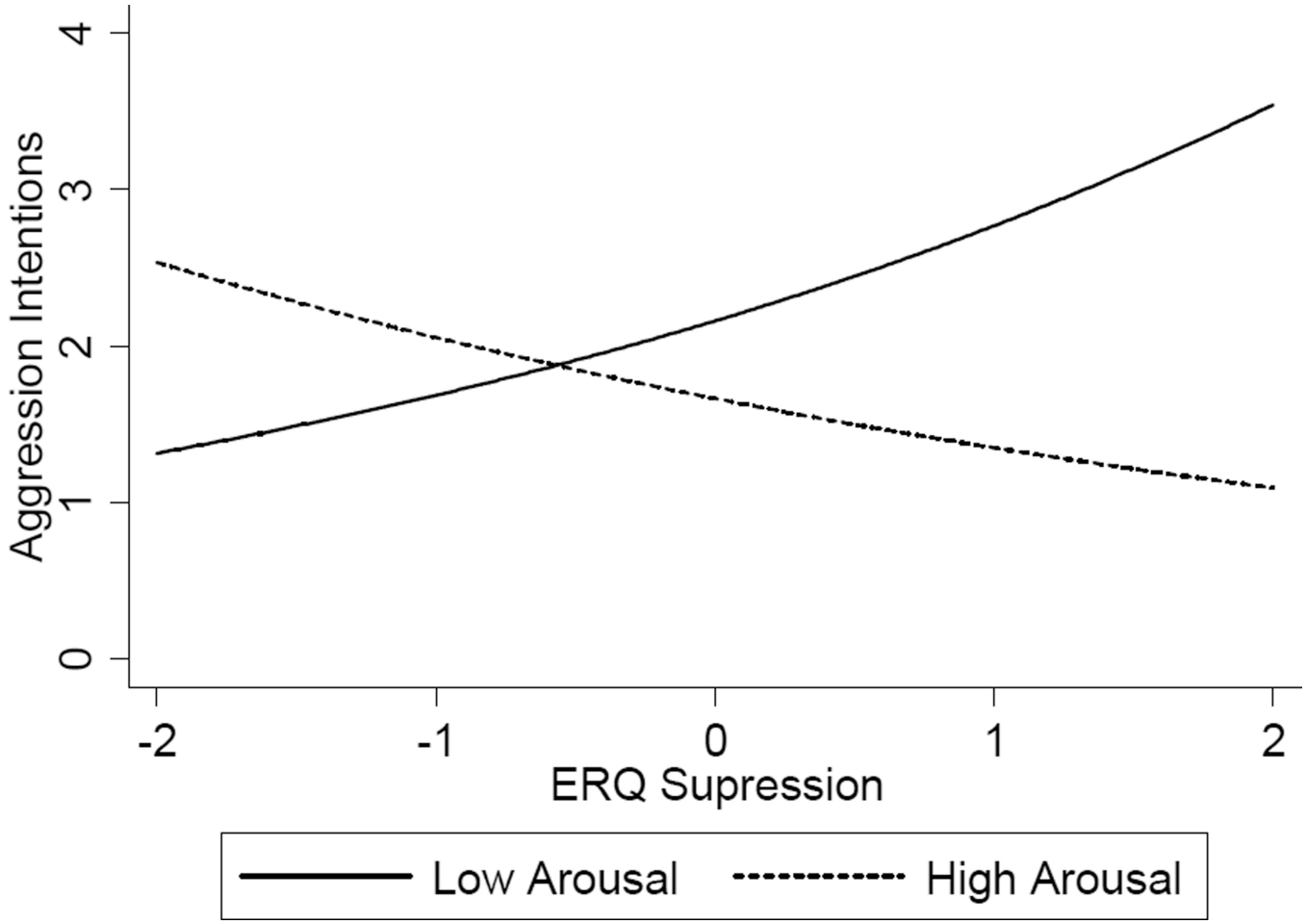

Figure 2.
Emotional arousal and emotional suppression interact to predict aggression intentions.

Table 1

Means (and Standard Deviations) for Emotion-Regulation, Emotional Arousal and Aggression Intentions by Beverage Condition

		Condition		
	Observed Range	Alcohol (*n* = 48)	Placebo (*n* = 48)	No Alcohol (*n* = 48)
		Mean (*SD*)	Mean (*SD*)	Mean (*SD*)
Typical weekly alcohol use				
Frequency	0 – 7	3.33 (1.37)$_a$	2.98 (1.56)$_a$	3.23 (1.87)$_a$
Quantity	0 – 15	3.73 (2.09)$_a$	3.05 (1.95)$_a$	3.41 (2.73)$_a$
Emotion regulation subscales				
Reappraisal	10 – 30	22.35 (4.07)$_a$	22.63 (3.99)$_a$	22.81 (3.88)$_a$
Suppression	4 – 18	10.19 (3.60)$_a$	10.92 (3.07)$_a$	9.69 (3.54)$_a$
POMS subscales				
Intoxication	5 – 29	13.96 (5.40)$_a$	8.98 (2.10)$_b$	7.44 (1.03)$_c$
Neurological effect	4 – 20	9.13 (4.18)$_a$	4.83 (1.58)$_b$	4.04 (0.20)$_c$
No. standard drinks	0 – 11	3.81 (1.86)$_a$	2.57 (0.81)$_b$	0.06 (0.43)$_c$
Average emotional arousal				
Neutral scenario	0.01 – 0.56	0.23 (0.14)$_a$	0.18 (0.13)$_b$	0.21 (0.14)$_{a,b}$
Conflict scenario	0.04 – 0.89	0.51 (0.21)$_a$	0.51 (0.17)$_a$	0.49 (0.19)$_a$
Aggression intentions				
Neutral scenario	0 – 12	0.48 (1.81)$_a$	0.29 (1.01)$_a$	0.17 (0.56)$_a$
Conflict scenario	0 – 37	3.40 (6.04)$_a$	2.13 (2.83)$_{a,b}$	1.65 (2.03)$_b$

Note. Means with different subscripts are significantly different ($p < .05$). POMS = Profile of Mood States; No. standard drinks = the number of standard drinks participants estimated having consumed during the beverage administration.

Table 2

The Effects of Alcohol Intoxication and Emotion Regulation on Aggression Intentions

	Aggression Intentions		
Variable	***b***	***IRR* [95% C.I.]**	***p*-value**
Neutral scenario aggression intentions	0.27	1.31 [1.05, 1.63]	.015
Alcohol	0.79	2.22 [1.27, 3.88]	.005
Placebo	0.45	1.56 [0.88, 2.78]	.122
Reappraisal	0.76	2.14 [1.29, 3.56]	.003
Suppression	0.03	1.03 [0.71, 1.49]	.874
Reappraisal × suppression	0.27	1.31 [1.03, 1.65]	.025
Alcohol × reappraisal	−0.79	0.45 [0.24, 0.85]	.013
Placebo × reappraisal	−0.80	0.45 [0.24, 0.83]	.011
Alcohol × suppression	−0.14	0.87 [0.48, 1.45]	.592
Placebo × suppression	−0.19	0.36 [0.83, 1.42]	.498

Note. IRR = incidence rate ratio; C.I. = confidence interval. The no alcohol condition is the reference category for the alcohol and placebo conditions.

Table 3

The Influence of Emotion Regulation and Emotional Arousal on Aggression Intentions

	Aggression Intentions		
Variable	***b***	***IRR* [95% C.I.]**	***p*-value**
Neutral scenario aggression intentions	0.27	1.31 [1.08, 1.59]	.006
Neutral scenario arousal	0.37	1.45 [1.12, 1.87]	.004
Reapprsaisal	0.15	1.16 [0.92, 1.46]	.207
Suppression	−0.28	0.76 [0.60, 0.96]	.020
Emotional arousal	−0.13	0.88 [0.67, 1.15]	.351
Reappraisal × suppression	0.30	1.35 [1.07, 1.69]	.011
Reappraisal × emotional arousal	0.11	1.12 [0.90, 1.38]	.311
Suppression × emotional arousal	−0.23	0.80 [0.65, 0.97]	.026

Note. IRR = incidence rate ratio; C.I. = confidence interval.