Effects of Alcohol Intoxication on Hostile Attribution Bias and Relational Aggression in Women

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Bias and Relational Aggression in Women

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Abstract

Alcohol intoxication is consistently linked to physical and sexual aggression in men, but not women. The lack of evidence supporting the relationship between alcohol and aggression for women could be due to a failure to measure relational aggression (i.e., harmful social manipulation), the form of aggression more commonly employed by women. Further, alcohol intoxication may interfere with the interpretation of social cues, resulting in greater perceived provocation in ambiguous social interactions and increased aggression. The current study examined the relationship between alcohol intoxication and relational aggression in women and the extent to which interpretation of social cues (i.e., hostile attribution bias) explains that relationship. Fifty female college students ($M_{age} = 21.82$ years, 76% White) were randomly assigned into an alcohol intoxication condition or a control condition and responded to vignettes depicting aggressive acts perpetrated against the respondent using a modified version of the Social Informational Processing-Attribution and Emotional Response Questionnaire (SIP-AEQ; Coccaro, Noblett, & McCloskey, 2009). Based on data from a pilot study designed to validate the modified SIP-AEQ measure, I isolated two vignettes that were the most likely to elicit relational aggression: the "telling secret" and "disinvited" vignettes. Overall, I found partial support for the primary hypothesis that alcohol intoxication would impact relational aggression. In the "telling secret" vignette, participants in the alcohol condition were significantly more willing to damage the reputation of the transgressor compared to the sober condition. Hostile attribution bias did not significantly vary as a function of alcohol intoxication and hostile attribution bias did not significantly mediate the relationship between alcohol and relational aggression. If replicated, findings suggest that the relationship between alcohol intoxication and

aggression is present in women, when considering one specific form of aggression (i.e.,

relational aggression: damaging the reputation of others).

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Introduction

The relationship between alcohol consumption and aggression is well documented in human and animal studies (Wells, Graham, & West, 2000; Bergvall, Fahlke, Jönsson, & Hansen, 1996). Much of this literature focuses on the relationship between alcohol consumption and physical aggression, including interpersonal violence (Cogan & Ballinger, 2006), sexual aggression (Testa, 2002) and violent crime (Murdoch, Pihl, & Ross, 1990). In a majority of these studies the relationship between alcohol consumption and aggression was only statistically significant in men.

Research suggests that aggressive behaviors may vary in frequency and type when comparing men and women. In a cross-sectional sample of 2,500 young adults, Colins and colleagues (2017) found that men and women with psychopathic personality traits were equally likely to be anger prone, hostile, aggressive, and equally likely to abuse alcohol and drugs. However, both women who reported high levels of psychopathic traits and women who reported low levels of psychopathic traits reportedly engaged in *less* physical aggression and *more* relational aggression compared to men in corresponding psychopathic trait groups. Relational aggression is defined as behaviors or social manipulation designed to harm another's relationship with peers or feeling of inclusion (e.g., withholding friendship or engaging in social alienation in order to hurt or control a peer) (Crick & Grotpeter, 1995). Research on relational aggression originated from youth studies, revealing that that aggressive behavior among girls is more aligned with their social inclusion concerns, while boys are more likely to harm peers through physical aggression or physical threats (Crick & Grotpeter, 1995; Robins, 1986). Crick and Grotpeter (1995) criticized youth aggression studies that fail to measure relational aggression resulting in severe underestimations of aggression exhibited by girls. This phenomenon has also

been observed in adult relationships. Cyone et al. (2017) found over a 5-year period, wives

reported using more relational aggression toward their partner than did their husbands. Relational

aggression was described as a resource used to gain power in the relationship and enact a desired

change. Cyone and colleagues (2017) found higher relational aggression scores were

significantly associated with lower self-rating of marital quality over time. Despite the links

between alcohol intoxication and aggression along with the evidence suggesting women are

more likely to engage in relational aggression than other forms of aggression, the body of

literature investigating the relationship between alcohol intoxication and relational aggression in

women is sparse.

The social information processing theory posits that when encountering social cues,

individuals engage in a six-step mental process: "(1) encoding of external and internal cues, (2)

interpretation and mental representation of those cues, (3) clarification or selection of a goal, (4)

response access or construction, (5) response decision, and (6) behavioral enactment" (Crick &

Dodge, 1994, p. 76). Coccaro, Noblett, and McCloskey (2008) argue that errors in any stage of

social information processing can bias an individual toward aggressive responding through

misinterpretation of hostile aggression and limited response selection. The cognitive impairments

associated with alcohol use could increase errors in the interpretation phase of social information

processing. The attention-allocation model posits that alcohol impairs cognitive functioning

resulting in a state referred to as alcohol myopia (i.e., the narrowing of focus during intoxication

associated with increased focus on salient provocative cues) (Steele & Josephs, 1990). Alcohol

myopia may lead to hypervigilance towards provocative hostile cues and increased likelihood of

attributing hostile intent to ambiguous actions resulting in a hostile attribution bias (Bayless &

Harvey, 2017). Further, Zeichner and Phil (1979) argue that alcohol myopia weakens one's

ability to perceive negative long-term consequences of aggressive behavior. Thus, impaired interpretation of social cues may explain the relationship between alcohol intoxication and aggressive behavior.

Crick and Dodge (1996) investigated children's social information processing patterns using hypothetical-situation instruments in which children were presented with stories of a provocative situation with ambiguous intent (e.g., a peer breaks your radio). Crick and Dodge (1996) assessed hostile attribution bias by asking the children to rate the provocateur's actions as intentional or accidental on a dimensional scale with a lower rating indicating accidental action and a higher rating indicating intentional action as well as the extent to which the attributions of the provocateur's actions were hostile (e.g., to get back at me) or benign (e.g., the radio wasn't made well). Results indicated that children who were rated by their teacher as more aggressive show greater hostile attribution bias in response to the vignettes. Coccaro, Noblett, and McCloskey (2008) adapted this measure of hostile attribution for use with adults and created the Social Informational Processing-Attribution and Emotional Response Questionnaire (SIP-AEQ). Coccaro and colleagues found that adults who met *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition* (DSM-IV; American Psychiatric Association, 1994) criteria for intermittent explosive disorder rated the vignettes with significantly more hostile attribution compared to healthy controls (2008). Controlled laboratory studies investigating the effects of alcohol intoxication on this form of hostile attribution bias have yet to be explored.

Taken together, these finding imply alcohol intoxication may interfere with social informational processing and result in greater perceived provocation in ambiguous social interactions and increased aggression. Further, in women, aggression is likely displayed in the form of relational aggression.

The Current Study

The present study investigated the relationship between alcohol intoxication and relational aggression in women and the extent to which hostile attribution bias explains that relationship. Participants were randomly assigned into an alcohol intoxication condition or sober control condition and presented with vignettes of physically aggressive and relationally aggressive acts perpetrated against the respondent. The intent of the perpetrator (i.e., accidental or intentional) was not stated. Hostile attribution bias was measured as likelihood of attributing hostile intent to provocateurs in each vignette.

Drawing from social informational processing and alcohol myopia theories and previous findings suggesting that errors in social informational processing can bias an individual toward aggressive responding through misinterpretation of hostile aggression and limited response selection (Coccaro et al., 2008) and alcohol myopia may lead to hypervigilance towards provocative hostile cues (Bayless & Harvey, 2017), this experiment tested the primary hypothesis that intoxicated women would exhibit significantly more relationally aggressive responses to vignettes compared to women in the control condition (**Hypothesis 1**). In addition, it was expected that intoxicated women would display significantly more hostile attribution bias in response to the vignettes compared to sober controls (**Hypothesis 2**). Finally, it was hypothesized that greater hostile attribution bias would mediate the relationship between alcohol intoxication condition and relationally aggressive responses to vignettes (**Hypothesis 3**), intoxicated women were expected to show higher hostile attribution bias which would lead to more relationally aggressive responses.

Method

Participants

Participants were 50 female college students between the ages of 21 to 29 years old (M_{age} = 21.82, *SD* = 1.37, 76% White) from the University of Arkansas (See Table 1 for demographic information about the sample). Participants recruited through the general psychology subject pool were compensated with course credit and participants from the larger University student population were financially compensated at a rate of $10 per hour. Exclusion criteria included any current medical condition, psychiatric condition, or medication for which alcohol consumption is contraindicated. Individuals with a likely alcohol use disorder requiring treatment were also excluded from the study, identified as a score greater than 14 on the Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Because these data were collected as part of a dissertation study about alcohol and aggression that also assessed alcohol's effects on sexual assault risk detection, I also excluded participants who endorsed symptoms of sexual assault related Post-Traumatic Stress Disorder.

Measures

Demographics. Participants reported age, gender, weight, race, and ethnicity.

Past-year hazardous alcohol use. Alcohol use was measured with the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993). The AUDIT is a 10-item self-report measure that assesses drinking behavior over the past year. Participants rate the questions regarding quantity, frequency and adverse reactions of alcohol consumption on a scale of 0 to 4. Summed total AUDIT scores of 15 or more are indicative of an alcohol use disorder (Babor, Fuente, Saunders, & Grant, 1989). The AUDIT has demonstrated excellent validity and reliability, with a six-nation standardization condition and specific

attention in item selection shown to gender appropriateness and cross culture generalizability (Bohn, Babor, & Kranzler, 1995; Lundin, Hallgren, Balliu, & Forsell, 2015).

Baseline aggression. Tendency to engage in aggressive behavior was assessed using the Self-Report of Aggression & Social Behavior Measure (SRASBM; Linder, Crick & Collins, 2002). The SRASBM is a 56-item self-report measure that assesses five factors: relational aggression ($n = 16$), physical aggression ($n = 6$), relational victimization ($n = 9$), physical victimization ($n = 6$), and pro-social behavior ($n = 11$). Participants respond on a 7-point Likert-type scale indicating how true each item is for them, now and during the last year. Subscale scores are calculated by finding the mean of all subscale items, with higher scores indicating higher endorsement of the subscale. Cross-gender relational aggression has showed acceptable internal consistency (Tavakol and Dennick, 2011), with a Cronbach's alpha of .73 (Linder et al., 2002).

Hostile attribution bias. Hostile attribution bias was assessed using a modified version of the Social Informational Processing-Attribution and Emotional Response Questionnaire (SIP-AEQ; Coccaro, Noblett, & McCloskey, 2008). The SIP-AEQ was modeled after the child-based instrument of Social Informational Processing (Crick & Dodge, 1996) and consists of eight vignettes of physically aggressive and indirect-relationally aggressive acts against the respondent. Vignettes involving physically aggressive acts include a co-worker hitting your car with their car door and being kicked by a classmate. Vignettes depicting relationally aggressive acts consist of a friend revealing a secret you asked them keep private, a friend breaking plans with you to spend time with someone else, a stranger cutting you in line, your friends rejecting your request to eat lunch with them, and social-club members ignoring your attempt to engage with them. Following each vignette, hostile attribution was assessed through participant's

judgment of direct hostile intent (e.g., "wanted to physically hurt me"), indirect-relationally

hostile intent (e.g., "wanted me to feel unimportant"), instrumental intent (e.g., "was in a hurry"),

and neutral intent (e.g., "by accident") on 4-point scale from 1 = *not at all likely* to 4 = *very*

likely. Scores were calculated by summing the total responses across all vignettes for direct

hostile intent questions with a range of 2-8 with higher scores indicating more hostile attribution

(Coccaro et al., 2008). The SIP-AEQ has shown excellent reliability and validity, including

convergent variability with the Hostile Automatic Thought Questionnaire (r = .27, p = .002)

(Snyder et al., 1997; Coccaro et al., 2008). The fourth vignette, describing a transgression during

a business trip, was omitted from the present study due to lack of relevance for a college student

population.

Likelihood of aggressive responding. To assess likelihood to engage in aggressive

behavior, I added five questions to each SIP-AEQ vignette asking how the respondent would

react in this situation. Reaction options were pulled from the Self-Report of Aggression & Social

Behavior Measure (SRASBM; Linder et al., 2002) and rated on a 4-point scale from 1 = *not at*

all likely to 4 = *very likely*. Two items assessed physical aggression (i.e., "I would push or shove

this person" and "I would retaliate by threatening to physically harm this person"), and three

items assessed relational aggression (i.e., "I would try to embarrass this person or make them

look stupid in front of his/her friends", "I would try to damage this person's reputation by

gossiping about him/her or by passing on negative information about him/her to other people",

and "I would exclude this person from future activities") (Linder et al., 2002). The relational

aggression subscale score was calculated by summing the three relational aggression scores

(range = 3-12). The physical aggression was calculated by summing the two physical aggression

scores (range = 3-8). Because there is relatively little known about how people exhibit relational

aggression, I also included a qualitative item which asks, "In your own words, briefly describe how you would react in this situation."

Given this measure was created specifically for this study, there was no evidence to support the psychometric properties of this revised SIP-AEQ. To assess reliability and validity of this new measure, a pilot study was conducted with an online, mixed gender (63 women, 55.3%)[1] sample of college students ($n = 114$, $M_{age} = 19.11$, 90.2% heterosexual). To analyze the qualitative responses to the question "[…] how would you react in this situation?", I used an inductive content analysis coding procedure advised by Braun and Clarke (2006). First, the qualitative coding team (one faculty advisor, one graduate student, and two undergraduate students) reviewed a subsample of responses to identify initial themes. The research team them created a code book with operational definitions, overarching themes, sub-themes and examples (see appendix E). Five overarching themes were identified: overarching aggression, physical aggression, relational aggression, non-aggressive action, and confrontation (i.e., addressing the transgression directly in any way). Four sub-themes of relational aggression were identified: exclusion from groups or activates, withdrawal of friendship, damage reputation through gossiping, damage the target's relationship with others, and other (i.e., any relationally aggressive act that is not conceptually similar the previous sub-themes).

I then prepared the data for coding by separating the qualitative responses into an excel document. Demographic information and information about the vignettes were hidden to reduce coding bias. Two undergraduate research assistants individually coded each response for the

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[1] Both men and women were included in the pilot study to expand upon the aforementioned research indicating gender differences in forms of aggression. Willingness to engage in physical or relational aggression did not very as a function of gender in the quantitative data analysis ($p > .05$). In the qualitative data analysis, women reported being significantly more likely to engage in relational aggression (9.5%) and significantly less likely to engage in physical aggression (7.9%) compared to men (0%; 21.7%) in vignette 2: "kicked too hard in karate class" only (χ^2 (1) = 4.636, $p = .031$; χ^2 (1) = 4.268, $p = .039$). In the other six vignettes, willingness to engage in physical or relational aggression did not very as a function of gender in the qualitative data analysis ($p > .05$).

presence or absence of each theme and sub-themes. In the pilot study and in the experimental study, Cohen's kappa coefficient for forms of aggression ranged from .457-.959 (see Table 2), indicating adequate to excellent interrater reliability (Banerjee, Capozzoli, McSweeney, & Sinha, 1999). Any disagreement between coders were resolved by the lead author.

Results of the qualitative data analysis (Table 3) showed that 57% of participants in the pilot study indicated that they would use relational aggression in vignettes 1 (a friend exposes your secret) and 34.2% in vignette 4 (A friend disinvites you from trip and goes with someone else). Less than 8% of participants reported that they would use relational aggression in vignettes 2, 3, 5, 6, and 7. Similarly, results of the quantitative (Table 4) showed that participants were more likely to use relational aggression in vignettes 1, 2 and 4. Internal consistency between the three quantitative forms of relational aggression (i.e., exclusion, damaging reputation, and withdrawal) was poor (Cronbach's alpha of .641 in vignette 1 (i.e., "telling secrets") and .554 in vignette 4 (i.e., "disinvited"), indicating the three forms should be examined separately, rather than as a total score of relational aggression.

As shown in Table 5, quantitative responses of relational aggression for "telling secrets" and "disinvited" vignettes were significantly related to the SRASBM subscales of reactive and proactive relational aggression. The "disinvited" vignette was significantly related to the BPAQ subscale of verbal aggression, while the "telling secrets" vignette was not significantly related. Quantitative responses of relational aggression for the "telling secrets" and "disinvited" vignettes were significantly related to the BPAQ subscale of physical aggression. The "disinvited" vignette was significantly related to the SRASBM subscale of reactive and proactive physical aggression, while the "telling secrets" vignette was not significantly related. Based on these

findings, I decided to focus the experimental study on the "telling secrets" vignette and the "disinvited" vignette.

Procedure

Upon arrival, participants were given an overview of the study, provide informed consent, and had their breath alcohol concentration (BrAC) measures to ensure sobriety, with an Intoximeter Alco-Sensor FST®. All participants signed a behavioral contract stating that if they consume alcohol for this study, they will not drive for the reminder of the evening and will remain in the laboratory until their BrAC is below 0.04%. Participants then completed a structured interview assessing study eligibility, addressing medication, medical history and alcohol use with the AUDIT. Pregnancy status was assessed with a urine pregnancy test.

Participants were randomly assigned to the intoxicated or control condition and notified of their assignment. In the intoxicated condition, participants consumed three drinks over a 10-minute period containing 50% alcohol by volume vodka mixed with club soda. The amount of alcohol was .477 g ethanol to 1 kg body weight for a target BrAC of 0.06%, consistent with previous work with women (Davis, Stoner, Norris, George, & Masters, 2009). After the drinking phase, BrAC was be measured every five minutes until the target BrAC is reached. The control condition will consume only club soda over a ten-minute period. The total amount of liquid consumed per kg body weight will be equivalent across conditions. To control for variability in alcohol absorption time, each participant in the intoxicated condition was matched with a "yoked" control participant who completed and equal number of BrAC readings and waited the same amount of time before continuing with the study (Giancola & Zeichner, 1997).

Following the alcohol absorption time, participants completed a sexual assault risk detection task and a facial recognition task, as part of a larger study. Participants then completed

the modified version of the SIP-AEQ, via Qualtrics, an online survey platform. Finally, participants were debriefed and all participants who consumed alcohol remained in the laboratory under supervision until their BrAC fell below 0.04%.

Data Analytic Plan

First, data were examined for missing data. Next, descriptive statistics were obtained for all study variables. Next, a series of independent-samples *t*-tests and Chi-Square tests were conducted to examine the effectiveness of random assignment to the alcohol and control conditions, with age, race/ethnicity, sexual orientation, year in school, and baseline aggression as dependent variables.

To examine the primary hypothesis, eight one-tailed independent sample *t*-test were conducted to assess the effect of alcohol condition (alcohol intoxication vs. control condition) on the quantitative measures of relational aggression separated by type of aggression (i.e., embarrass, damage reputation, exclude), as the dependent variable.

To examine the second hypothesis, a one-tailed independent sample *t*-test was conducted to assess the effect of alcohol condition, as the dichotomous independent variable, on hostile attribution bias, as the continuous dependent variable. To test the third hypothesis, I used SPSS version 23.0 with Hayes' (2012) PROCESS macro. Consistent with Preacher and Hayes' (2004) recommendations, I used model 4 with bias-corrected bootstrapping (with 2000 replicates) to identify the mediating effect of hostile attribution on the significant interaction between alcohol condition and willingness to damage reputation in the "telling secrets" vignette.

Two power analyses were conducted to estimate the sample size necessary to conduct the independent samples *t*-tests using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). First, I used an effect size from Rohsenow and Bachorowski's (1984), which found a small correlation

of $r = .29$ between alcohol intoxication and social retaliation. The *a priori* power analysis for a one-tailed, independent samples *t*-test, $a = .05$, power $= .80$, and $d = .606$ resulted in an estimated total sample size of 66. Teige-Mocigemba, Hölzenbein, and Klauer (2016) found a medium correlation of $r = .30$ between self-reported trait aggression and accurate recognition of aggressive and nonaggressive facial expressions. The *a priori* power analysis for a one-tailed, independent *t*-test, $a = .05$, power $= .8$, and $d = .629$ resulted in a total a sample size of 64. Given the previous literature, a sample size of 66 would have been adequate to observe the relationship between alcohol intoxication and willingness to engage relational aggression if one exists. With a sample size of 66 the mediation effects of emotional facial recognition would likely be underpowered; however, mediation analyses could provide initial information about the effect size to inform future research. The target sample size for this study was 66. The final sample size of 50 is likely underpowered to detect effects. Of the 88 participants who completed the phone screener and were scheduled for a laboratory appointment. Of the 62 participants attended the appointment and consented to the study, 4 participants failed to pass the post consent health screen and 8 participants did not completed the measures needed for this study.

Results

Preliminary Analysis

A series of independent-samples *t*-tests and Chi-Square tests were conducted to examine the effectiveness of random assignment to the alcohol and control conditions. Demographic variables and baseline aggression did not differ significantly between the alcohol and control conditions (see table 1). See Table 6 for zero-order correlations among hostile attribution bias scores, relational aggression variables, and baseline aggression. The total sample showed low

levels of both reactive (*M* = 1.705, *SD* = .747) and proactive (*M* = 1.400, *SD* = .549) baseline

relational aggression as measured by the SRASBM with a possible range of 1-7.

Primary Analysis

Consistent with hypothesis one, the quantitative data analysis revealed a significantly

higher willingness to damage reputation in response to the "telling secrets" vignette than in the

alcohol condition (*M* = 1.42, *SD* = .809) compared to control condition (*M* = 1.25, *SD* = .442), *t*

(48) = -.928, *p* = .035. However, contrary to hypothesis one, the relationship between relational

aggression and alcohol condition was not significant in the other forms of relational aggression

for the "telling secrets" and "disinvited" vignettes (see table 7). The qualitative analysis revealed

a non-significant pattern of relationships between types of relational aggression and alcohol

condition for both vignettes (see table 7).

Contrary to the second hypothesis, hostile attribution did not significantly vary as a

function of condition in the "telling secrets" vignette nor in the "disinvited" vignette, *p*s > .05

(see Table 7).

The third hypothesis that the effect of alcohol condition on relational aggression would

be mediated by hostile attribution bias was not supported. The direct effect of alcohol condition

on willingness to damage reputation was not significant, nor was the indirect effect of hostile

attribution on alcohol condition and willingness to damage reputation, *p* > .05. Full pattern of

mediation results is shown in Table 8 and in Figure 1.

Discussion

The current study tested the relationship between alcohol intoxication and relational

aggression in women and the extent to which hostile attribution bias explains that relationship

using vignettes of hypothetical social transgressions. Through qualitative and quantitative

analysis of an online pilot study designed to validate the modified SIP-AEQ measure, I isolated two vignettes that were the most likely to elicit relational aggression (i.e., "telling secret" vignette and "disinvited" vignette).

Overall, I found partial support for the primary hypothesis that alcohol intoxication would impact relational aggression. In the "telling secret" vignette, participants in the alcohol condition were significantly more willing to damage the reputation of the transgressor (i.e., a form of relational aggression) compared to the sober condition. This relationship between the other forms of relational aggression (i.e., embarrass and exclude) and alcohol intoxication was not significant in the "telling secret" vignette. In the "disinvited" vignette, there were not significant difference in any form of relational aggression by alcohol condition.

In a 2008 meta-analysis of alcohol related intimate partner violence, Foran and O'Leary presented the multiple threshold model which posit that the disinhibition caused by alcohol interacts with predispositions (e.g., personality traits, views of violence) to result in increased likelihood of violence perpetration. Under this theory, an individual with low risk factors for aggression while sober are not likely to commit intimate partner violence while intoxicated because the disinhibiting effect of alcohol is not severe enough to elevate such a low-risk individual over the threshold of aggression. Conversely, for individuals with high risk factors for intimate partner violence, the alcohol disinhibition may be sufficient to move them over the threshold of perpetrating violence. Considering that the multiple threshold model could also impact relational aggression, individuals with a higher baseline levels of relational aggression may be more likely to engage in relational aggression while intoxicated. Further research focusing on individuals with high levels of baseline relational aggression may yield clearer insight on the relationship between alcohol intoxication and relational aggression.

The remaining hypotheses were not supported. Contrary to hypothesis two, hostile attribution bias did not vary as a function of alcohol intoxication. Contrary to hypothesis three, hostile attribution did not significantly mediate the relationship between alcohol condition and relational aggression: damage reputation. It is likely that the scenarios used in the vignettes were not sufficiently damaging enough to elicit strong hostile attribution, resulting in a floor effect of hostile attribution scores, as evidenced by the average hostile attribution scores of 3.9 ($SD = 1.607$) for the "telling secrets" vignette and 4.4 ($SD = 1.321$) for the "disinvited" vignette, each on a 2 to 8 scale. During debriefing, several participants noted that social transgressions from a romantic partner would elicit higher hostile attribution, compared to the vignettes of friends or strangers used in the present study. Several participants also noted that social transgressions committed against their friend, compared to themselves, would be more likely to elicit relational aggression in order to avenge a friend. More in-depth qualitative research is required to isolate forms of social transgressions that would be most likely to elicit hostile attribution and relational aggression. Because the data was collected as part of a larger study of sexual assault risk detection, participants were asked questions about sexual assault and listened audio recordings of a mock sexual assault during a date before completing the relational aggression task. The social comparison theory posits that individuals compare their opinions of social interactions with other social interactions to create more accurate evaluations (Festinger, 1954). One explanation for the null hostile attribution findings could be that, in comparison to the sexual assault scenarios, the vignettes used in this study to elicit relational aggression were not severe enough to be considered hostile. However, we think that is unlikely because the pilot data, where all participants were not administered alcohol, did not include any sexual assault cues and resulted in comparable evaluations of hostility.

The social information processing theory is a cognitive theory of social behavior. Impulse behavior (e.g., aggression) is often conceptualized as emotionally driven behavior. For example, Wray, Simons, Dvorak, and Gaher (2012) found that difficulty controlling behavior while negatively aroused is directly related to increased risk behavior while intoxicated for individuals with high trait negative affect and low affect distress tolerance. Negative urgency (i.e., tendency to act rashly when experiencing negative emotions) is associated with increased aggression and alcohol use (Lynam & Miller, 2004). If aggression is an impulsive behavior, then cognitive theories of aggression may not be as applicable. Relational aggression may become automatic for some individuals through frequent rehearsal, making relational aggression more automatic in response to negative urgency. Future research including measures of emotional urgency in response to social vignettes could help us understand if willingness to engage in relational aggression is based on emotionally driven behavior or cognitive decision making. Understanding the role of cognition and emotions in relational aggression may be important in understanding the impact of alcohol in relational aggression.

Limitations

The current study has several limitations to consider. Generalizability of this study is limited by the sample of majority White, heterosexual, non-Latina college women. Future research including a more diverse sample would increase generalizability of these results. Recruitment for this study was not targeted towards individuals with high levels of trait relational aggression. Given the multiple threshold model (Foran & O'Leary, 2008), recruiting individuals with a higher baseline levels of relational aggression would likely result in more engagement of relational aggression while intoxicated and would help us better understand the relationship between alcohol, hostile attribution, and relational aggression.

Drinking behavior and relational aggression in an isolated and controlled laboratory setting likely differs from behavior in social environments (e.g., bars or parties). Further, in a laboratory setting, due to participant safety concerns, I was limited in the amount of alcohol I administered to each participant. Higher levels of alcohol intoxication may have a greater impact on relational aggression. Asking participants about willingness to aggress through a questionnaire, compared to an interview, may reduce response bias based on social desirability. However, allowing participants adequate time to type and edit their responses may allow participants to second guess impulsive behavior (e.g., aggression) and select a behavior more in line with their long-term goals (e.g., a pro-social discussion with the friend). Future research should examine the relationship between alcohol and relational aggression in more naturalistic social environments.

Due to the small sample size, this study was likely underpowered to detect the effects of alcohol on relational aggression. The effect sizes for the primary analysis, displayed in table 7, were small (Cohen's ds range = .041-.410) indicating that a large sample size would be necessary to show significant differences between conditions in a sample that is not specifically recruited for high levels of baseline relational aggression. Future research should include a larger sample of individuals with high baseline levels of relational aggression.

Conclusions

Overall, I found partial support for the primary hypothesis that alcohol intoxication would impact relational aggression. In the "telling secrets" vignette, participants in the alcohol condition were significantly more willing to damage the reputation of the transgressor compared to the sober condition. Hostile attribution bias did not significantly vary as a function of alcohol intoxication and hostile attribution bias did not significantly mediate the relationship between

alcohol and relational aggression. If replicated, findings suggest that the relationship between alcohol intoxication and aggression is present in women, when considering one specific form of aggression (i.e., relational aggression: damaging the reputation of others). Future research should focus on a wider range of individuals with high risk factors for relational aggression.

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Appendices

Appendix A

Tables

Table 1. *Demographic Variables and Differences Across Conditions.*

	Total Sample ($N = 50$)	Control ($n = 24$)	Alcohol ($n = 26$)	*t*-test or Chi-square
Age Mean (*SD*)	21.82 (1.366)	22.08 (1.692)	21.58 (0.945)	$t(48) = 1.320, p = .060$
Race/Ethnicity				$\chi^2(6, N = 50) = 7.370, p = .288$
White, non-Hispanic	38 (76%)	20(83%)	18 (69.2%)	
Black or African American	3 (6%)	1(4.2%)	2 (7.7%)	
Latino or Hispanic	3 (6%)	0	3 (11.5%)	
Asian or Asian American	1 (2%)	0	1 (3.8%)	
Middle Eastern or Middle Eastern American	1 (2%)	0	1 (3.8%)	
American Indian/Native American	2 (4%)	2(8.3%)	0	
Bi- or multi-racial	2 (4%)	1(4.2%)	1 (3.8%)	
Sexual Orientation				$\chi^2(3, N = 48) = 4.949, p = .176$
Heterosexual	43 (86%)	22 (91.7%)	21 (80.8%)	
Gay/Lesbian	1 (2%)	1 (4.2%)	0	
Bisexual	2 (4%)	0	2 (7.7%)	
Queer	2 (4%)	0	2 (7.7%)	
Not Reported	2 (4%)	1 (4.2%)	1 (3.8%)	
Year in School				$\chi^2(3, N = 50) = .740, p = .864$
Junior	14 (28%)	6 (25%)	8 (30.8%)	
Senior	28 (56%)	14 (58.3%)	14 (53.8%)	
Graduate	5 (10%)	3 (12.5%)	2 (7.7%)	
Not in School	3 (6%)	1 (4.2%)	2 (7.7%)	
Relational Aggression	($N = 40$)	($n = 18$)	($n = 21$)	
Reactive Relational Aggression	1.705 (.747)	1.574 (.649)	1.818 (.821)	$t(37) = -1.014, p = .317$
Proactive Relational Aggression	1.400 (.549)	1.379 (.581)	1.419 (.533)	$t(37) = -.228, p = .809$

Table 2. *Interrater Reliability for Qualitative Analysis of Forms of Relational Aggression in the Pilot Study Across all Vignettes and in the Experimental Study in the "Telling Secrets" Vignette and the "Disinvited" Vignette.*

Study	Coded response	Kappa coefficient
Pilot study	Overarching Aggression	.792
	Physical Aggression	.672
	Relational Aggression	.812
	Exclusion	.838
	Withdrawal	.749
	Damage reputation (gossip)	--
	Damage relationship with others	--
	Other relational aggression	--
Experimental study	"Telling Secrets "Vignette	
	Overarching Aggression	.754
	Physical Aggression	--
	Relational Aggression	.752
	Exclusion	.578
	Withdrawal	.457
	Damage reputation (gossip)	--
	Damage relationship with others	--
	Other relational aggression	--
	"Disinvited" Vignette	
	Overarching Aggression	.959
	Physical Aggression	--
	Relational Aggression	.917
	Exclusion	.848
	Withdrawal	.728
	Damage reputation	--
	Damage relationship with others	--
	Other relational aggression	--

Note: -- indicates insufficient positive codes in the specified theme to calculate a Kappa coefficient.

Table 3. *Frequency of Aggressive Responses from the Qualitative Questions "[…] what would you do in that situation?" from Both Men and Women in the Pilot Study.*

Vignette	Response Theme	Frequency	Percent
1: A friend exposes your secret	Overarching Aggression	69	60.5%
	Relational Aggression	65	57.0%
	Physical Aggression	2	1.8%
2: Karate classmate kicks you excessively hard	Overarching Aggression	24	21.1%
	Relational Aggression	7	6.1%
	Physical Aggression	16	14.0%
3: Someone cuts you in line at a coffee shop	Overarching Aggression	12	10.5%
	Relational Aggression	5	4.4%
	Physical Aggression	6	5.3%
4: A friend disinvites you from trip and goes with someone else	Overarching Aggression	41	36.0%
	Relational Aggression	39	34.2%
	Physical Aggression	0	0%
5: Friend says you cannot sit with them at lunch	Overarching Aggression	11	9.6%
	Relational Aggression	9	7.9%
	Physical Aggression	2	1.8%
6: Club members do not acknowledge your "Hi!"	Overarching Aggression	6	5.3%
	Relational Aggression	5	4.4%
	Physical Aggression	1	0.9%
7: Someone hits your car with their door and walks away	Overarching Aggression	7	6.1%
	Relational Aggression	3	2.6%
	Physical Aggression	3	2.6%

Table 4. *Quantitative Rating of Aggressive Responses in the Modified SIP-AEQ from Both Men and Women in the Pilot Study.*

Vignette	Response Theme	*M*	*SD*
1: A friend exposes your secret	Relational Aggression	5.161	1.957
	Physical Aggression	2.455	1.047
2: Karate classmate kicks you excessively hard	Relational Aggression	4.823	1.993
	Physical Aggression	3.116	1.406
3: Someone cuts you in line at a coffee shop	Relational Aggression	3.723	1.459
	Physical Aggression	2.196	0.669
4: A friend disinvites you from trip and goes with someone else	Relational Aggression	4.732	1.671
	Physical Aggression	2.170	0.628
5: Friend says you cannot sit with them at lunch	Relational Aggression	4.009	1.545
	Physical Aggression	2.161	0.651
6: Club members do not acknowledge your "Hi!"	Relational Aggression	3.839	1.312
	Physical Aggression	2.170	0.651
7: Someone hits your car with their door and walks away	Relational Aggression	3.955	1.979
	Physical Aggression	2.405	1.090

Note. Higher scores indicate greater likelihood of engaging in an aggressive response.

Table 5. *Pearson Correlation Between Quantitative Responses of Aggression Items in the Modified SIP-AEQ, SRASBM, and BPAQ in the Pilot Study.*

Variables	1	2	3	4	5	6	7	8	*M*	*SD*
1 Modified SIP_AEQ relational aggression "telling secrets" vignette	_								5.161	1.957
2 Modified SIP_AEQ relational aggression "disinvited" vignette	.680**	_							4.732	1.671
3 SRASBM proactive relational aggression	.276**	.427**	_						7.793	3.608
4 SRASBM reactive relational aggression	.470**	.626**	.663**	_					10.081	4.277
5 SRASBM proactive physical aggression	.117	.341**	.629**	.560**	_				3.982	1.894
6 SRASBM reactive physical aggression	.171	.269**	.314**	.357**	.641**	_			4.496	2.834
7 BPAQ physical aggression	.304**	.415**	.349**	.412**	.141**	.661**	_		21.929	9.214
8 BPAQ verbal aggression	.173	.211*	.307**	.205*	.268*	.311**	.485**	_	14.089	5.586

*Note. *p* < .05, **p* <.01

Table 6. *Correlations Among Baseline Relational Aggression, Hostile Attribution Bias, Quantitative Relational Aggression.*

Variable	1	2	3	4	5	6	7	*M*	*SD*
1 Baseline Relational Aggression "Telling Secrets" Vignette	-							17.205	6.59
2 Embarrass	.421**	-						1.28	.607
3 Damage Rep.	.388*	.727**	-					1.34	.658
4 Exclusion	.453**	.428**	.407**	-				2.54	1.054
"Disinvited" Vignette									
5 Embarrass	.194	.591**	.768**	.448**	-			1.18	.482
6 Damage Rep/	.344*	.391**	.764**	.397**	.713**	-		1.26	.633
7 Exclusion	.415*	.167	.188	.482**	.279*	.286*	-	2.58	1.180
8 Hostile Attribution	.256	.363**	.225	.485**	.284*	.102	.419*	24.96	5.876

Note. *p* < .05, **p* <.01. Embarrass = self-reported willingness to engage in relational aggression in the form of embarrassing someone in response to the vignette. Damage Reputation = self-reported willingness to engage in relational aggression in the form of damaging someone's reputation in response to the vignette. Exclusion = self-reported willingness to engage in relational aggression in the form of excluding someone from future activates in response to the vignette.

Table 7. *Effect of Alcohol Condition on the Quantitative Measure of Relational Aggression and Hostile Attribution.*

	Control	Alcohol	*t*	*df*	*p*	*Cohen's d*
"Telling Secrets" Vignette						
Hostile Attribution	3.958 (1.601)	3.846 (1.642)	.244	48	.741	.069
Relational aggression						
Embarrass	1.21 (.509)	1.35 (.689)	-.799	48	.184	.231
Damage	1.25 (.442)	1.42 (.809)	-.928	48	.035	.261
Reputation	2.67 (1.049)	2.42 (1.065)	.814	48	.848	.237
Exclusion						
"Disinvited" Vignette						
Hostile Attribution	4.083 (1.018)	4.615 (1.525)	-1.461	48	.151	.410
Relational aggression						
Embarrass	1.17 (.381)	1.19 (.567)	-.186	48	.552	.041
Damage	1.29 (.624)	1.23 (.652)	.337	48	.682	.094
reputation	2.46 (1.250)	2.69 (1.123)	-.697	48	.213	.194
Exclusion						

Note: Embarrass = self-reported willingness to engage in relational aggression in the form of embarrassing someone in response to the vignette. Damage Reputation = self-reported willingness to engage in relational aggression in the form of damaging someone's reputation in response to the vignette. Exclusion = self-reported willingness to engage in relational aggression in the form of excluding someone from future activates in response to the vignette.

Table 8. *Mediation Results of Hostile Attribution on the Relationship Between Alcohol Condition and Willingness to Damage Reputation in the "Telling Secrets" Vignette.*

	B	*SE*	95% CI	*p*
Step 1				
Alcohol Condition → Hostile Attribution Bias	-.112	.459	-1.036, .811	.808
$F(1, 48) = .060, p = .808, R^2 = .0012$				
Step 2				
Alcohol Condition → Damage Reputation	.175	.189	-.204, .554	.359
Hostile Attribution Bias → Damage Reputation	.015	.059	-.104, .135	.796
$F(2, 48) = .456, p = .637, R^2 = .019$				
Indirect Effect				
Alcohol Condition → Hostile Attribution Bias → Damage Reputation	-.002	.025	-.068, .039	--

Appendix B

Figure

Figure 1. Mediation Results

B = -.112, [-1.036, .811]

Hostile
Attribution Bias

B = .175, [-.204, .554]

Alcohol
Intoxication

Damage Reputation
Responses to Vignettes

B = .015, [-.104, .135]
B' = .148, [-.2044, .554]
Indirect effect: -.002, [-.068, .039]
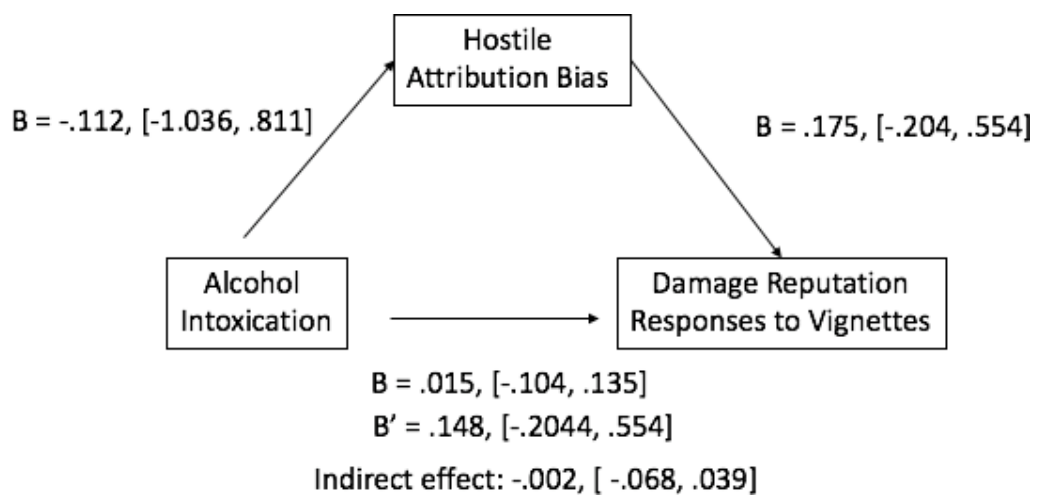
Appendix C

Demographic Survey

1. What is your age? _____

2. What is your sexual orientation?   Heterosexual / Bisexual / Homosexual / Other

    _____

3. What year are you in school?

    Freshman / Sophomore / Junior / Senior / Graduate Student / Other

4. Are you a member of a Greek organization (e.g., Fraternity or Sorority)

    a. Yes / No

5. How would you descript your race/ethnicity (please select all that apply)?

    White (non-Hispanic) **/** Black or African American (non-Hispanic) **/** Latino or Hispanic **/**

    Asian or Asian American **/** Middle Eastern or Middle Eastern American / Native

    American or American Indian / Other _____

6. Marital status:

    _____single; never married

    If single: are you currently in a serious relationship?_____No_____Yes

    _____married

    _____separated

    _____divorced

    _____widowed

    _____other: _____

7. How old were you when you had your first drink of alcohol (more than just a sip)?

    _____

8. On average, how many nights per week did you consume alcohol over the last month?

    (please circle):

    1 night   2 nights   3 nights   4 nights   5 nights   6 night   7 nights/week

9. On average, how many standard alcoholic drinks did you consume

Appendix D

Relational Aggression
Qualitative Analysis Code Book

1 = present
0 = absent

Overarching aggression
- Any aggression
- Including relational and physical aggression
- Also includes using profanity (i.e., fuck you)

Physical Aggression
- Behaviors or threats to physically harm, or physical intimidation
    - Hit, shove
    - "I am going to kick your ass"
    - Making someone afraid you will hurt them

Relational Aggression
- "Behaviors that are intended to significantly damage another child's feelings of inclusion by the peer group" (Crick & Gotpete, 1995)
- Subcategories
    - **Exclusion from groups or activities**
        - Excluding the target individual from activities
        - Excluding them from <u>part</u> of a friendship (telling secrets, eating lunch together)
        - I wouldn't invite them anymore
        - I wouldn't talk to them outside of class
    - **Withdrawal**
        - purposefully withdrawing friendship or acceptance
        - Ghosting
        - Silent treatment
        - Temporarily withdrawal
        - *Note: Withdrawal is totally removing yourself from a friendship while exclusion is not participating is a specific component of a friendship*
    - **Damage the targets reputation**
        - Spreading rumors
        - Threaten to tell their secrets
    - **Damage relationship with others**
        - Telling others what the target did to get others on your side (friends, teachers, superiors)
        - Flirt with their boyfriend/girlfriend
        - Anything that would cause others not reject the target person
    - **Other relational aggression**
        - **Any relational aggression that doesn't in the above categories**

- NOTE: if relational aggression is present enter 1 for overarching aggression 1 for overarching relational aggression and a 1 for the specific subcategory of relational aggression

Non-aggressive action
- Any <u>action</u> that is no relationally/physically aggressive
- Note: this must be an action (ex: just being mad is coded as 0)

Emotions or thoughts alone
EX:
- "I would feel upset/hurt/sad"
- "I would think they don't like me"
- "I wouldn't trust them" (this does not include I wouldn't share secrets with them anymore)
- "I would never forgive them"

Confrontation
- 1 = addressing the transgression with them in any way
- 0 = not bringing it up to them, walking away, going on with your life

Online/social media (public)
- Posting anything done online
- Group text

Texting/DM (private)
- Directly messaging the person

Appendix E

IRB Approval Form

UNIVERSITY OF
ARKANSAS

Office of Research Compliance
Institutional Review Board

July 27, 2017

MEMORANDUM

TO: Alex Melkonian
                Megan Gardner
                Benni Scallion
                Lindsay Ham

FROM: Ro Windwalker
                IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 17-07-006

Protocol Title: *How Does Alcohol Intoxication Impair Risk Detection of Sexual
                Assault? Testing an Integration of Alcohol Myopia and Social
                Information Processing Theories*

Review Type: ☐ EXEMPT   ☒ EXPEDITED   ☐ FULL IRB

Approved Project Period: Start Date: 07/27/2017   Expiration Date: 07/16/2018

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of
one year. If you wish to continue the project past the approved project period (see above), you
must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the
expiration date. This form is available from the IRB Coordinator or on the Research Compliance
website (https://vpred.uark.edu/units/rscp/index.php). As a courtesy, you will be sent a reminder
two months in advance of that date. However, failure to receive a reminder does not negate
your obligation to make the request in sufficient time for review and approval. Federal
regulations prohibit retroactive approval of continuation. Failure to receive approval to continue
the project prior to the expiration date will result in Termination of the protocol approval. The
IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 100 participants. If you wish to make *any*
modifications in the approved protocol, including enrolling more than this number, you must
seek approval *prior to* implementing those changes. All modifications should be requested in
writing (email is acceptable) and must provide sufficient detail to assess the impact of the
change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG
Building, 5-2208, or irb@uark.edu.