

Summer 2014

Environmental Context and Aggression: An Experimental Demonstration of the Role of Alcohol Expectancies

Brynn E. Sheehan
Old Dominion University

Follow this and additional works at: https://digitalcommons.odu.edu/psychology_etds

 Part of the [Experimental Analysis of Behavior Commons](#)

Recommended Citation

Sheehan, Brynn E.. "Environmental Context and Aggression: An Experimental Demonstration of the Role of Alcohol Expectancies" (2014). Master of Science (MS), thesis, Psychology, Old Dominion University, DOI: 10.25777/vmt2-5985
https://digitalcommons.odu.edu/psychology_etds/110

This Thesis is brought to you for free and open access by the Psychology at ODU Digital Commons. It has been accepted for inclusion in Psychology Theses & Dissertations by an authorized administrator of ODU Digital Commons. For more information, please contact digitalcommons@odu.edu.

**ENVIRONMENTAL CONTEXT AND AGGRESSION: AN
EXPERIMENTAL DEMONSTRATION OF THE ROLE OF
ALCOHOL EXPECTANCIES**

by

Brynn E. Sheehan
M.A. August 2011, University of New Hampshire
B.A. May 2010, Bloomsburg University

A Thesis Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE

PSYCHOLOGY

OLD DOMINION UNIVERSITY
August 2014

Approved by:

Cathy Lau-Barraco (Director)

Michelle Kelley (Member)

Richard Landers (Member)

ABSTRACT

ENVIRONMENTAL CONTEXT AND AGGRESSION: AN EXPERIMENTAL DEMONSTRATION OF THE ROLE OF ALCOHOL EXPECTANCIES

Brynn E. Sheehan
Old Dominion University, 2014
Director: Dr. Cathy Lau-Barraco

Research has extensively investigated predictors of alcohol-related aggression. Alcohol expectancy theory suggests that the link between alcohol and aggression may be related to one's beliefs regarding the expected effects of alcohol on aggression. As such, research has found that exposure to a bar environment may elicit alcohol-related aggression expectancies (Wall, McKee, & Hinson, 2000; Wall, McKee, Hinson, & Goldstein, 2001). Additionally, aggression expectancies have shown to predict direct aggression, such as hitting or yelling (Leonard, Collins, & Quigley, 2003; Smucker Barnwell, Borders, & Earlywine, 2006). While these research studies have shown separately that alcohol cues elicit aggression expectancies, and that expectancies may elicit direct aggression, these relationships have not yet been examined in a single experimental design. Additionally, indirect aggression has recently been identified in the literature as a subtype of aggression (see Archer & Coyne, 2005 for a review). Limited research suggests that indirect aggression may be elicited by alcohol cue words. However, the impact of alcohol-related cues on indirect aggression via alcohol-related aggression expectancies has yet to be examined. Consequently, the present study sought: 1) to experimentally test the influence of an alcohol-relevant context (i.e., simulated bar vs. neutral context) on forms of aggression (i.e., direct and indirect aggression), while controlling for dispositional aggression, 2) to test alcohol-related aggression expectancies as a mediator of the influence of alcohol-related context on forms of aggression, and 3) to

test typical drinking as a potential moderator of the relationship between alcohol-relevant context and forms of aggression. Participants were 48 undergraduate student drinkers. Results indicated that the simulated bar condition failed to elicit aggression expectancies as well as direct and indirect aggression. As the present study failed to attain the sample size determined by a priori power analyses, future research should strive to attain adequate sample size to determine the true relationships among these variables.

This thesis is dedicated to my parents, Ronald and Donna Sheehan.

ACKNOWLEDGEMENTS

First and foremost I would like to thank my advisor, Dr. Cathy Lau-Barraco, for her consistent support and guidance throughout this process. I would also like to thank my committee members, Dr. Michelle Kelley and Dr. Richard Landers, for their feedback and assistance. Finally I would like to thank my mother, whose constant motivation and encouragement has helped me be where I am today.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	ix
 Chapter	
I. INTRODUCTION.....	11
DIRECT AGGRESSION.....	11
DIRECT AGGRESSION AND ALCOHOL USE	12
INDIRECT AGGRESSION.....	15
INDIRECT AGGRESSION AND ALCOHOL USE.....	16
ALCOHOL EXPECTANCY THEORY.....	18
ALCOHOL-RELATED AGGRESSION EXPECTANCIES	21
STUDY PURPOSE.....	23
 II. METHOD.....	 27
PARTICIPANTS.....	27
RECRUITMENT.....	27
PROCEDURES.....	28
CONDITIONS.....	31
DEBRIEFING.....	31
MEASURES.....	32
 III. RESULTS.....	 37
AIM 1.....	39
AIM 2.....	41
AIM 3.....	44
 IV. DISCUSSION	 47
ALCOHOL-RELATED CONTEXT AND AGGRESSION	47
ALCOHOL-AGGRESSION EXPECTANCIES AND AGGRESSION.....	49
TYPICAL ALCOHOL USE AS A MODERATOR.....	51
GENERAL DISCUSSION.....	52
FUTURE DIRECTIONS	53
LIMITATIONS	55
 V. CONCLUSIONS.....	 57
 REFERENCES.....	 58
 APPENDICES	
A. DEMOGRAPHIC QUESTIONNAIRE.....	70
B. DISPOSITIONAL AGGRESSION QUESTIONNAIRE.....	72
C. ALCOHOL USE QUESTIONNAIRE.....	74
D. ALCOHOL EXPECTANCY QUESTIONNAIRE.....	75

E. STUDY SCRIPT.....77
F. DECEPTION QUESTIONNAIRE.....79
G. SHORT DEBRIEFING HANDOUT.....80
H. FULL DEBRIEFING HANDOUT.....81

VITA.....83

LIST OF TABLES

Table	Page
1. Correlations, Means, and Standard Deviations of Variables.....	38
2. Standardized Regression Coefficients for Dispositional Aggression and Experimental Condition on Aggression.....	40
3. Standardized Regression Coefficients for the Mediating Effect of Aggression Expectancies on Experimental Condition and Aggression	43
4. Standardized Regression Coefficients for Experimental Condition, Alcohol Use, and their Interaction on Aggression.....	45
5. Standardized Regression Coefficients for Condition on Aggression Expectancies, Direct Aggression, and Indirect Aggression.....	46

CHAPTER I

INTRODUCTION

Research on human aggression has long investigated the characteristics and predictive influences of such acts. Many subtypes of aggression have been identified, but two common forms are direct and indirect aggression (see Buss, 1961; Richardson & Green, 1999). Although separate and distinct, these acts of aggression involve the interaction of at least two individuals with the intent to instill harm on the other. Forms of aggression have been examined in relation to alcohol consumption. For many individuals, aggression often is accompanied by drinking (Bushman & Cooper, 1990; Dougherty, Cherek, & Bennett, 1996; Eckhardt & Crane, 2008; Giancola, 2002; Giancola, Godlaski, & Parrott, 2005; Giancola, Godlaski, & Roth, 2012; Giancola & Zeichner, 1995). Much of the research on this topic has focused on identifying individual-level differences that may predispose drinkers to become aggressive. One of these factors is a person's aggression expectancies about alcohol use, which may be elicited when exposed to alcohol-related stimuli (see Goldman, Del Boca, & Darkes, 1999). In general, individuals who believe alcohol increases aggression are more likely to become physically or verbally aggressive when in the presence of alcohol and alcohol cues. However, previous research has not experimentally tested the influence of alcohol-related stimuli on indirect aggression. The current proposal aims to examine the influence of alcohol related cues (i.e., simulated bar) on direct and indirect aggression through their effect on alcohol expectancies.

Direct Aggression

The most commonly studied and best understood form of aggression is direct aggression. Direct aggression, which consists of physical and verbal aggression, is an action that delivers harmful stimuli to another person (Buss, 1961; Richardson & Green, 1999). Physical aggression can be described as assault against a person by means of the aggressor's body parts or weapons. Often, the aggressor may attempt nonaggressive or milder aggressive acts on the victim, such as asking them to move or shoving them, before engaging in more extreme aggressive acts such as hitting or punching, which is likely to escalate violence (Buss, 1961). Verbal aggression refers to a vocal response such as threats or insults. While verbal aggression may not result in physical injuries, research has highlighted the psychological damage of verbal criticisms, threats, and abuse such as depressive symptoms and changes in children's inferential styles regarding self-characteristics (Buss, 1961; Gibb & Abela, 2008).

Investigations of direct aggression have identified many factors that may increase one's propensity to engage in this type of behavior. For instance, research has identified a consistent sex difference in direct aggression, with men exhibiting more direct aggression than women (Richardson & Green, 1999). Other known factors that contribute to aggression include provocation (Giancola, Godlaski, & Parrot, 2005; Gussler-Burkhardt & Giancola, 2005; Hoaken & Pihl, 2000), dispositional aggressivity (Eckhardt & Crane, 2008; Giancola, 2002) and self-regulation and control (DeWall, Baumeister, Stillman, & Gailliot, 2007; Giancola, Godlaski, & Roth, 2012). However, one factor that has garnered much attention is alcohol use.

Direct aggression and alcohol use. Approximately 50% of men and 40% of women report to have observed aggression in or around an alcohol facility (Leonard,

Quigley, & Collins, 2002). Numerous reviews and evaluations have demonstrated the association between alcohol use and aggression (Bushman & Cooper, 1990; Graham, West, & Wells, 2000). A large body of research supports that in general, alcohol consumption increases the likelihood of engaging in directly aggressive acts. Findings come from both experimental and observational studies.

In general, findings from experimental studies have found that individuals who consume alcohol exhibit more physical and verbal aggression compared to those who do not consume alcohol (Bushman & Cooper, 1990; Dougherty, Cherek, & Bennett, 1996; Eckhardt & Crane, 2008; Giancola, 2002; Giancola et al., 2005; Giancola, Godlaski, & Roth, 2012; Giancola & Zeichner, 1995). In this field of research, direct aggression has been assessed using a variety of methods. Some of these include applying shocks to a participant, stealing points from an opponent (see Giancola & Chermack, 1998 and Tedeschi & Quigley, 2000 for reviews of measures), and assessing aggressive verbalizations to a simulated conflict (Eckhardt & Crane, 2008). One recent study investigated alcohol's effect on physical aggression, demonstrating gender differences regarding the strength of alcohol's predictive effects (Giancola et al., 2009). Alcohol was found to produce medium and small effects on aggression for men and women, respectively. Experimental data also highlights the verbal aggression inducing effects of alcohol use. In one study, individuals who scored high in aggressivity verbalized three times more aggressive responses when given an alcoholic beverage as compared to those who were given a placebo (Eckhardt & Crane, 2008).

Consistent with experimental data, observational and survey data also highlight the relationship between alcohol use and aggression. Observations of bar-related

violence, interviews with participants, and self-reported incidences of alcohol-related aggression are used to investigate the influence of alcohol and potential triggers of aggression in bars (Graham & Wells, 2001; Leonard, Collins, & Quigley, 2003; Leonard, Quigley, & Collins, 2002; Wells & Graham, 2003; Wells, Graham, Speechley, & Koval, 2005). Results from examinations of bar-related violence suggest that severity of the injuries sustained and threats by the respondent were significantly related to the respondent's perceived level of intoxication (Wells & Graham, 2003). Similarly, Leonard and colleagues (2003) surveyed participants who experienced bar violence and found that heavy consumption by the participant and the opponent was associated with aggression severity and physical harm (Leonard et al., 2003). Verbal aggression has shown also to be associated with drinking when assessed via self-reported surveys. Specifically, heavy drinking days compared to non drinking days have been found to be associated with verbal acts of aggression (Parks, Hsieh, Bradizza, & Romosz, 2008). Among heavy drinkers, frequent heavy drinking days were associated with verbal acts of aggression and arguments (Rolfe et al., 2006). Similar relationships have been found when investigating workplace aggression. In an examination of verbal aggression at work, frequent drinking days and frequent days of heavy drinking in the previous year were associated with verbal aggression in the workplace (McFarlin, Fals-Stewart, Major, & Justice, 2001).

To further our understanding of the link between alcohol and direct aggression, researchers have focused on identifying variables that may influence this relationship. One such factor is dispositional or trait aggression (Giancola, 2002; Smucker Barnwell, Borders, & Earleywine, 2006). Trait aggression is an individual's aggressive disposition.

Individuals with higher trait aggression may be predisposed to behave more aggressively than those lower in this trait. Trait aggression is positively related to alcohol use (Giancola, 2002), aggression expectancies (Smucker Barnwell et al., 2006), and aggressive responses (Eckhardt & Crane, 2008). Further, it has been found to moderate the alcohol-aggression relationship (Giancola, 2002; Smucker Barnwell et al., 2006). Given the established influence of trait aggression on the alcohol-aggression relationship, future research examining the effects of aggression related to alcohol will need to control for this construct. Doing so will enable us to tease out other individual factors that may increase the propensity to become aggressive.

Overall, both experimental and observational research has supported the relationship between direct aggression and alcohol. Findings suggest that physical aggression and aggressive verbalizations may be elicited by the consumption of alcohol. One gap in previous research, however, is a lack of focus on indirect aggression. Investigations of indirect aggression and alcohol use are warranted given recent evidence of a potential relationship (Subra, Muller, Begue, Bushman, & Delmas, 2010) and the lack of studies investigating this type of aggression among adults.

Indirect Aggression

Indirect aggression recently has been identified as a subtype of aggressive behavior. It is delivered circuitously and defined as harm to a victim via mediating persons and events (see Archer & Coyne, 2005 for a review; Bjorkqvist, Osterman, & Kaukiainen, 1992). This type of aggression may be verbal, such as spreading rumors, or it may be physical, such as damaging one's possessions (Buss, 1961, p 8). Unlike direct aggression, indirect aggression does not include threats of physical harm. Instead, it

focuses on the social exclusion or degrading of one's reputation and manipulation of social standing, rather than the direct coercing of an individual (Archer, & Coyne, 2005). As indirect aggression does not require direct confrontation, the perpetrator is able to inflict pain on the victim through social manipulation and use of a third party, concealing the act and intention of aggression (Bjorkqvist, Osterman, & Lagerspetz, 1994), and reducing the risk of retaliation (Warren, Richardson, & McQuillin, 2011).

Although indirect aggression may appear to bystanders as if there is no presence of aggression, victims still suffer substantial psychological harm (Bjorkqvist et al., 1994). Victims may become withdrawn, experience decreased sense of belongingness, and be at risk for behaving aggressively themselves. In a study investigating the effects of being socially excluded, participants reacted more aggressively to criticism and offered negative ratings of others, compared to those who had not been excluded (Twenge, Baumeister, Tice, & Stucke, 2001). Another study revealed that indirect victimization during childhood predicts perfectionism in early adulthood (Miller & Vaillancourt, 2007). Other studies have found that indirect victimization often leads to feelings of social ostracism and is related to high levels of depression, anxiety, suicide ideation, and future social maladjustment (see Archer, & Coyne, 2005 for a review).

Indirect aggression and alcohol use. There is limited research investigating alcohol's relationship with indirect aggression. A review of this literature yielded four studies in all that examined alcohol and indirect aggression among adults (Friedman, McCarthy, Bartholow, & Hicks, 2007; Giancola & Zeichner, 1995; Hoaken & Pihl, 2000; Subra, Muller, Begue, Bushman, & Delmas, 2010). The findings across these studies were mixed. Specifically, one study found that alcohol consumption may increase one's

propensity to engage in indirect aggression (Giancola & Zeichner, 1995). However, Hoaken and Pihl (2000) found alcohol consumption to increase indirect aggression only for male but not female participants. A major limitation of the aforementioned studies, however, is the way in which indirect aggression is measured.

The measure of indirect aggression that was used in the two previously mentioned studies (i.e., Giancola & Zeichner, 1995; Hoaken & Pihl, 2000) is the duration of shocks applied to a confederate. This measure, however, is not typically used as an assessment of indirect aggression because it varies from typical definitions and is consistent more so with that of physical aggression. For this reason, the authors of these studies noted the possible inaccurate interpretation of the aggression measure used and advised that findings be interpreted with caution (Giancola & Zeichner, 1995; Hoaken & Pihl, 2000). Thus, the association between alcohol use and indirect aggression warrants additional research.

More recently, studies have examined participants' indirect aggression toward the experimenter in response to alcohol-related cues (Friedman, McCarthy, Bartholow, & Hicks, 2007; Subra, Muller, Begue, Bushman, & Delmas, 2010). These studies examined indirect aggression in relation to exposure to alcohol cues (e.g., a bottle of vodka, a bottle of whiskey, alcohol-related words such as 'beer' and 'vodka') with the idea that such cues would elicit alcohol-related responses including aggression (Goldman, Del Boca, & Darkes, 1999). In particular, these studies examined whether subliminal exposure to alcohol primes would impact indirect aggression. While these researchers did not label their aggression measure as indirect, an examination of their description of aggression in their studies revealed that they are consistent with the definition of indirect aggression in

other research (e.g., Coyne, Archer, & Eslea, 2004). For example, Subra and colleagues (2010) measured aggression via participants' evaluative ratings of the experimenter. Participants rated the experimenter's overall performance and indicated the degree to which they would recommend the experimenter conduct future studies. Participants were told their evaluations would be given to the department. In effect, the participant was given the opportunity to negatively impact the experimenter. Findings indicated that exposure to alcohol-related cues increased indirect aggression. Additionally, the effect of alcohol-related cues was just as strong as the effect of aggression-related cues on indirect aggression, highlighting the relationship between alcohol and indirect aggression. Similarly, Friedman and colleagues (2007) asked participants to rate the experimenter's performance. Findings indicated that exposure to alcohol-related words predicted increased hostility ratings of the experimenter. These are the first studies to emphasize the potential connection between alcohol cues and what can be defined as indirect aggression. Consequently, the cognitive associations that have shown to impact the alcohol-direct aggression relationship, such as alcohol expectancies, may also play a role in the relationship between alcohol and indirect aggression.

Alcohol Expectancy Theory as a Conceptual Framework for Alcohol-Related Aggression

Alcohol expectancy theory suggests that alcohol-related aggression is a result of the individual's beliefs about the effects of alcohol. The theory states that individuals develop expectations about alcohol consumption and its effects, which in turn impacts their drinking and their behavior (Goldman, Del Boca, & Darkes, 1999). In particular, as

it relates to aggression, holding the belief that alcohol causes or leads to aggression increases the propensity to become aggressive when exposed to alcohol.

Alcohol expectancy theory. Alcohol expectancies are information stored in memory about the effects of alcohol consumption. Expectancies may develop prior to drinking onset and are acquired via direct and indirect learning (Goldman, Del Boca, & Darkes, 1999). They can be understood through a classical conditioning model in that they are cognitive responses to stimuli. Expectancies are a learned relationship between a stimulus, response, and the outcome of the response (see Goldman, Del Boca, & Darkes, 1999 for a review). Cognitively, expectancies can be thought of as part of a neural network connecting alcohol cues, alcohol, and alcohol-related responses. As Goldman and colleagues (1999) discuss, expectancies are aptly named in that they prepare the drinker for future circumstances based on previously experienced events. For example, alcohol-related images may elicit cognitive responses related to alcohol use despite the individual not consuming any alcohol. As such, alcohol expectancies in memory may be primed, or activated, by alcohol-related information.

Alcohol expectancies are well established in the literature and are found to predict both the onset of drinking and the development of drinking problems (Conway, Swendsen & Merikangas, 2003; Goldman et al., 1999). Positive expectancies, or beliefs regarding the positive effects of drinking, have been found to be associated with greater alcohol consumption. Conversely, negative expectancies, or beliefs regarding the negative effects of drinking, are associated with decreased consumption (see Monk & Heim, 2013 for a review). Expectancies have been found to predict alcohol-related

behaviors including consumption (Lau-Barraco & Dunn, 2009) and problematic drinking (Conway et al., 2003; Lewis & O'Neill, 2000).

Experimental studies in which participants were exposed to cues, such as the drinking environment and alcohol words or images, have shown to elicit these cognitions in memory. For example, in an examination of the influence of the bar environment, individuals were asked to respond to 59 alcohol-related and ambiguous words and statements (Lau-Barraco & Dunn, 2009). Alcohol-related responses, such as “beer” in response to the word “pitcher,” indicate memory associations between the words and statements, and alcohol. Findings indicated that participants in the experimental condition, who were exposed to the simulated bar environment rather than the laboratory, reported significantly more alcohol-related memory associations. Further, primed participants consumed more alcohol drinks compared to those who were not primed by alcohol words. Similarly, Weingardt and colleagues (1996) found that exposure to positive outcomes of alcohol use prompted cognitions related to alcohol. Specifically, participants’ naming of alcohol words (e.g., booze, drink, wine) was faster when they were first presented with alcohol words and behaviors compared to when they were presented with neutral words (e.g., bridge). Furthermore, this effect was strongest for heavy drinkers. Findings support the expectancy theory that alcohol-related cognitions may be automatically activated in memory when individuals are exposed to alcohol-related stimuli.

Overall, alcohol-related cues have shown to impact the recall of alcohol-related memories and cognitions (Lau-Barraco & Dunn, 2009; Wall, McKee, & Hinson, 2000; Wall, McKee, Hinson, & Goldstein, 2001; Weingardt, Stacy, & Leigh, 1996). Further,

priming of alcohol cues has shown to impact consumption behavior (Lau-Barraco & Dunn, 2009) and cravings for alcohol (Lit & Cooney, 1999). Thus, it appears that alcohol-related information can be activated by the bar environment, and influence subsequent behavior. As eliciting expectancies has shown to affect behavior, specific expectancies related to alcohol such as aggression expectancies, may impact aggressive behavior.

Alcohol-related aggression expectancies. Alcohol expectancies most germane to aggression are alcohol-related aggression expectancies. As noted earlier, alcohol-related aggression expectancies are defined as the belief that alcohol causes drinkers to become violent or aggressive. Aggression expectancies have been shown to be related to typical alcohol quantity (Borders, Smucker Barnwell, & Earleywine, 2007; Smucker Barnwell et al., 2006), dispositional aggression (Borders et al., 2007; Smucker Barnwell et al., 2006), alcohol-related aggression (Giancola, Godlaski, & Parrott, 2005), and self-reported alcohol-related violence (Smucker Barnwell et al., 2006). They have also been shown to facilitate the occurrence of aggression (Leonard, Collins, & Quigley, 2003).

In general, cross-sectional studies indicate that individuals with the belief that alcohol makes them aggressive are more likely to have experienced alcohol-related physical violence in the previous year (Leonard, Collins, Quigley, 2003; Quigley et al., 2002). Smucker Barnwell and colleagues (2006) extended this research, supporting the moderating role of expectancies in the alcohol consumption and alcohol-related aggression relationship. They found that alcohol increases aggression but only for those who support the belief that alcohol causes aggression. Additionally, consumption and aggression expectancies interacted to predict specific aggressive behaviors, including

fighting in bars after drinking, slapping or hitting someone after drinking, and breaking things after drinking. These findings support that individuals who believe alcohol causes aggression are more likely to experience various aggressive acts related to their drinking.

Because of the limitations of cross-sectional designs, experimental studies have investigated the effect of alcohol-related stimuli on alcohol-related aggression cognitions. In general, this line of research has found that alcohol stimuli may increase aggression expectancies. For instance, Wall and colleagues (2001) found that participants more strongly endorsed alcohol-related aggression expectancies in a naturalistic bar setting as compared to a laboratory setting. Thus, in line with research that has shown alcohol stimuli to elicit alcohol expectancies (Lau-Barraco & Dunn, 2009; Weingardt, Stacy, & Leigh, 1996) the bar context appears to act as an implicit cue, activating alcohol-related aggression cognitions in memory.

Extending this research, experimental studies have also demonstrated that alcohol cues may influence more than aggression expectancies and may actually impact behavior. Research has shown that among individuals who believe alcohol increases aggression, alcohol-related cues such as alcohol words and images can elicit direct and indirect aggressive behavior (Bartholow & Heinz, 2006; Friedman, McCarthy, Bartholow, & Hicks, 2007). Specifically, Bartholow and Heinz (2006) found that among individuals with moderate to high alcohol-related aggression expectancies, hostility perception of others was increased when participants were shown alcohol print advertisements as the alcohol cue (e.g., Budweiser beer, Grey Goose vodka) compared to neutral print advertisements (e.g., Bounty paper towels, Kraft cheese; Bartholow & Heinz, 2006). Results revealed also that hostility ratings of individuals with low aggression

expectancies did not differ by the alcohol or neutral prime condition, suggesting that aggression expectancies also moderate the relation between alcohol-related stimuli and aggression. Similarly, another study found that individuals who were exposed to alcohol-related words and reported high alcohol-related aggression expectancies were more likely to critically evaluate a third person, compared to when they were presented with non-alcohol words (Friedman et al., 2007). It appears that aggression expectancies interact with alcohol-related primes to increase the propensity of becoming aggressive for some individuals but not all.

Overall, alcohol expectancy theory suggests that the link between alcohol use and aggression is related to one's beliefs regarding the expected effects of alcohol on aggression. In this theory, alcohol-related aggression expectancies have been shown to predict aggression. Experimental studies have shown that exposure to a bar environment may elicit alcohol-related aggression expectancies (Wall et al., 2001). Additionally, studies have shown that exposure to alcohol-related primes (e.g., advertisements and words) increases indirect aggression among individuals with strong alcohol aggression expectancies (Bartholow & Heinz, 2006; Friedman et al., 2007). Thus, while previous studies have shown separately that alcohol-related cues elicit aggression expectancies, and that aggression expectancies elicit direct aggression, testing these relationships in a single experimental design has not been conducted to date. Further, the impact of alcohol-related cues on indirect aggression via aggression expectancy activation has yet to be examined. Thus, more research is needed to understand the influence of an alcohol-related cue, such as a bar environment, on aggression expectancies and direct and indirect aggression.

Study Purpose

The purpose of the present experimental study was to test the effect of alcohol-related context on direct and indirect aggression through its effect on one's expectancies. Exposure to an alcohol-related prime (i.e., bar environment) was expected to elicit one's alcohol-related aggression expectancies. In turn, aggression expectancies were expected to predict both direct and indirect aggression. Additionally, typical alcohol quantity was predicted to moderate these relationships, such that the strength of the bar environment to predict aggressive responses was expected to be greater for those who report consuming greater levels of alcohol. Given the known influence of trait aggression on aggressive responses (Eckhardt & Crane, 2008; Giancola, 2002; Giancola et al., 2005; Smucker Barnwell et al., 2006), all analyses controlled for trait aggression. The current study had 3 aims and 6 hypotheses.

Aim 1: To experimentally test the influence of an alcohol-relevant context (i.e., simulated bar vs. neutral context) on forms of aggression (i.e., direct and indirect aggression).

Hypothesis 1: Previous research suggests that the bar context is related to increased aggression (Wells & Graham, 2003; Wells, Graham, Speechley, & Koval, 2005), and alcohol-related cues have been found to elicit hostility perception (Bartholow & Heinz, 2006). Based on this research, it was hypothesized that exposure to alcohol-related cues in the simulated bar condition, as opposed to the neutral context, would predict increased direct aggression (as measured by a computerized game with a factitious opponent).

Hypothesis 2: It was hypothesized that participants in the simulated bar condition would exhibit greater indirect aggression (as measured by evaluative responses to a vignette) compared to individuals exposed to a neutral condition.

Aim 2: To test alcohol-related aggression expectancies as a mediator of the influence of alcohol-related context (i.e., simulated bar vs. neutral context) on forms of aggression (i.e., direct and indirect aggression).

Hypothesis 3: Research has identified the mediating role of alcohol-related expectancies (Friedman et al., 2007). Alcohol-related aggression expectancies have been identified as a mediator of the relationship between alcohol cues and behavioral responses. Aggression expectancies have been shown to be activated by alcohol-related primes and increase hostile behavior in participants (Bartholow & Heinz, 2006). Based on this research, it was hypothesized that exposure to an alcohol-related prime (i.e., simulated bar) would elicit one's alcohol-related aggression expectancies, which would positively predict *direct* aggression.

Hypothesis 4: Similarly, it was hypothesized that the alcohol-related prime (i.e., simulated bar) would elicit greater alcohol-related aggression expectancies which would positively predict *indirect* aggression.

Aim 3: To test alcohol quantity as a potential moderator of the relationship between alcohol-relevant context (i.e., simulated bar) and forms of aggression (i.e., direct and indirect aggression).

Hypothesis 5: Previous research has found heavy episodic drinking and alcohol quantity to be significantly associated with alcohol-related aggression (Wells & Graham, 2003; Wells, Graham, Speechley, & Koval, 2005). Based on this

research, it was hypothesized that drinking quantity would moderate the relationship between alcohol-related context (i.e., simulated bar) and direct aggression. Specifically, the relationship between alcohol-context and direct aggression was expected to be stronger for higher versus lower drinkers.

Hypothesis 6: Similarly, it was hypothesized that drinking quantity would moderate the relationship between alcohol-related context (i.e., simulated bar) and indirect aggression. Specifically, the relationship between alcohol-context and indirect aggression was expected to be stronger for higher versus lower drinkers.

CHAPTER II

METHOD

Participants

To be eligible, participants must have been (1) at least 18 years of age, and (2) typically have consumed five standard alcohol drinks weekly in the previous month. Based on the medium to large effect size found in previous literature (Lau-Barraco & Dunn, 2009), g-power estimates using a medium effect size for a multiple regression analysis with two predictor variables (i.e., condition, expectancies; condition, alcohol quantity), approximately 120 participants were needed for the current study. Fifty eight undergraduate students at Old Dominion University (ODU) participated in the present study. One participant's qualitative responses revealed they were not deceived by the PSAP measure and thus was removed from all analyses. Additionally, nine participants indicated that they typically consumed less than five standard alcohol drinks per week and were removed from analyses. The final sample consisted of 48 participants who were randomly assigned to either control ($N = 26$) or experimental ($N = 22$) condition. Post-hoc power analyses indicated the resulting power was; $1 - \beta = .124$. Of the total sample, the majority of participants were female ($N = 35$; 72.9%). The average age was 24.13 ($SD = 10.18$) years. The sample was comprised of 23.4% freshmen, 12.8% sophomores, 27.7% juniors, and 36.2% seniors. Sample ethnicity was 45.8% Caucasian, 35.4% African American, 10.4% Hispanic, 4.2% Asian, and 4.2% "Other." Participants reported consuming an average of 15.2 ($SD = 9.4$) alcohol drinks per week.

Recruitment

Participants were recruited through SONA, the online undergraduate research pool system. The study was published on SONA as a two-part study; part I, an online survey, was completed 7-14 days prior to part II, the experimental portion. Due to a small sample size at the half-way point of data collection, changes were submitted to the Institutional Review Board (IRB) committee allowing only those participants who completed both phases of the study to receive credit for their participation. Therefore, participants who failed to complete phase II within the 14-day time frame did not receive credit for participation in phase I or phase II. The overall study was estimated to take 1.5 hours to complete both phases (i.e., 30 minutes for the online survey and 60 minutes for the experimental portion). Participants received .5 off-site and 1 on-site SONA credit for their participation, and were entered into a drawing to win one of ten \$10 Starbucks gift cards. This study was approved by the IRB on human subjects research, and followed APA ethics guidelines (APA, 2002).

Procedure

As part of recruitment, participants were told that an alcohol research lab and a human cognition lab in the psychology department at ODU were collecting data for various projects. Participants were informed that there were two phases to the study. Phase I consisted of a baseline assessment via an online survey. The survey assessed participant demographic information, dispositional aggression, drinking behavior, and alcohol expectancies (see Appendices A, B, C, and D). Phase II consisted of the experimental portion of the study and evaluated the influence of the environmental prime on expectancy endorsement and aggression. Informed consent was electronically signed at the start of the first phase of the study.

Phase I. Participants completed phase I online, at their own convenience.

Participants were told that they were to complete measures in phase I in order to cut down on the amount of time they were needed in-person during phase II. While completing the online survey, participants provided an eight digit unique identification number. The number was used to match their data from both phases of the study.

Phase II. Using a random number generator, participants were randomly assigned to either the experimental (simulated bar) or control (neutral room) condition. Participants in both conditions completed the study in groups of up to three people.

Upon arriving to the study, participants were seated at their own small table with a private lap top and were asked to provide their eight digit identification number that they provided during phase I. Participants were informed that they first would be completing a measure for the alcohol lab regarding their beliefs about alcohol use (i.e., Comprehensive Effects of Alcohol [CEOA]; see Appendix D).

Following the CEOA, participants completed a measure of direct aggression. Consistent with previous research (Carré, Gilchrist, Morrissey, & McCormick, 2010; Dougherty, Bjork, Bennett, & Moeller, 1999; Dougherty, Cherek, & Bennett, 1996; Golomb, Cortez-Perez, Jaworski, Mednick, & Dimsdale, 2007), direct aggression was assessed with the Point Subtraction Aggression Paradigm (PSAP). Participants were told that this task was to be completed for the cognitions lab. Participants were given the following instructions regarding this particular task: “As you will soon read, you’ll be playing this game against an opponent in the cognition lab across the hall. The goal of the game is to assess reaction time and game play. Participants in the cognition lab are not completing some of the questions that you had to complete so they’ll already be

logged on when you're ready to play the game. All instructions you'll need for the game will appear on your computer once you finish the alcohol measure" (see Appendix E). The points stolen from the participant are fixed to subtract points after a set number of presses. Aggression was assessed via the number of points stolen from the fictitious opponent. This direct measure of aggression took 28 minutes to complete.

Following the PSAP, participants completed the indirect aggression measure. Indirect aggression was measured by participants' evaluation of a third person (adapted from DeWall, Twenge, Gitter, & Baumeister, 2009) using the "Donald" paragraph (Srull & Wyer, 1979). Participants were given the following instructions regarding this particular task: "This is a task that looks at how we form perceptions and evaluations of others. You will be asked to read a paragraph written by an ODU student and respond to the questions that follow. We would like you to complete an evaluation of the student author as if that student were applying to work in our research lab as a research assistant. This is to give us an idea of your perception of the author and how qualified you think they would be for a research assistant job" (see Appendix E). As part of this method, participants were instructed to read a series of sentences that can be perceived as either neutral or hostile. After reading the paragraph, participants rated their impression of the essay author. They were then asked to provide a candidate evaluation of the essay author as if the author were applying to work in a research lab in the psychology department. The participants then provided an evaluation of the essay author via 10 questions, with composite scores measuring their indirect aggression. This task took approximately five minutes.

Evaluation of Deception. Following the last task, participants were given a questionnaire assessing the deception used in the study. Consistent with studies that have used the Donald paragraph (Akrami, Ekehammar, & Araya, 2006; Brown, Boniecki, & Walters, 2004), participants were asked to indicate what they believed the three tasks were assessing. Participants were asked to provide an open-ended answer regarding each of the tasks they participated in during phase II. Data from any participant who indicated that they believed the study was an assessment of aggression, or an assessment about the effect of alcohol stimuli, were removed from further analyses (see Appendix F for deception questionnaire). Additionally, consistent with experiments that have used the PSAP (Cherek, Moeller, Schnapp, & Dougherty, 1997), participants were asked to (1) estimate the number of subjects they had been paired with that day, (2) describe those subjects, and (3) estimate whether they had subtracted more or less points than the other subjects. Participant data were removed from all analyses if they indicated they believed the game was an assessment of aggression.

Conditions

Simulated bar experimental condition. The experimental condition was conducted in a simulated bar laboratory. The simulated bar was adorned to mimic a bar environment. The bar included an 11 foot long bar table, 5 bar stools, and 3 small round tables with chairs. Many alcohol-related cues were visible throughout the room including a dart board, neon signs, and numerous empty alcohol bottles.

Neutral condition. The neutral condition was conducted in the same room as the experimental condition; however, a black curtain surrounded the room to ensure that the

participants were not exposed to any of the alcohol-related cues. The only objects visible to participants were 3 small round tables and chairs.

Debriefing

After participants completed the three tasks and the deception questionnaire, a research assistant walked them out of the laboratory, thanked them for their participation, and asked them not to discuss the study with anyone. Consistent with previous research using similar deception (Coyne, Archer, & Eslea, 2004), participants were not fully debriefed until the end of data collection (see Appendix H for full debriefing handout). This delay was to prevent participants from telling peers about the true nature of the study. The debriefing form, including the explanation of the study, the phone number to the Counseling Center, and the researcher's contact information, was emailed to each student following the completion of data collection.

Measures

Dispositional Aggression. To measure an individual's dispositional or trait aggression, the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) was administered (see Appendix B). The BPAQ is a 29-item questionnaire which measures dispositional aggression. Participants report the degree to which statements are characteristic of them on a 1-7 Likert scale. Responses range from "extremely uncharacteristic" to "extremely characteristic" of the participants' behavior. The scale contains items such as "When frustrated, I let my irritation show." A mean composite score was computed with higher scores indicating higher dispositional aggression. This measure has been shown to have good test re-test reliability (Buss, & Perry, 1992). Current study internal reliability, $\alpha = .92$.

Alcohol Consumption. The Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985) was used to assess alcohol consumption (see Appendix C). Participants report the number of alcoholic drinks they typically consume for each day of a typical week over the previous three months. The DDQ has adequate convergent validity with self-report measures of alcohol-related problems (Collins, Bradizza, & Vincent, 2007; Collins, Koutsky, & Izzo, 2000; Collins & Lapp, 1992). Total number of drinks consumed in a typical week was computed from this measure and used as the measure of alcohol consumption.

Alcohol Aggression Expectancies. The Comprehensive Effects of Alcohol is a 38-item measure that assesses alcohol expectancies (CEOA; Fromme, Stroot, & Kaplan, 1993; see Appendix D). Participants indicate the degree to which they agree with each item, on a scale from 1 (disagree) to 4 (agree). The CEOA consists of 7 subscales: Sociability, Tension Reduction, Liquid Courage, Sexuality, Cognitive and Behavioral Impairment, Risk and Aggression, and Negative Self-perception. The Risk and Aggression subscale was the focus of this study. The Risk and Aggression subscale consists of items such as “I would act tough” and “I would take risks.” The CEOA has adequate internal consistency ($\alpha = .66-.86$) and criterion validity (Fromme et al., 1993, Ham, Stewart, Norton, & Hope, 2005). The risk and aggression expectancies have shown adequate reliability, $\alpha = .80$ (Zamboanga, Schwartz, Ham, Jarvis, & Olthuis, 2009). Current study internal reliability, $\alpha = .72$.

Indirect Aggression. Aggression-evoking scenarios and questionnaires are often created and tailored in order to measure indirect aggression for a particular study (Coyne, Archer, & Eslea, 2004; Giskevicius, Perea, Tybur, Gangestad, & Shapiro, 2009; Hess &

Hagen, 2006). In the current experimental design, indirect aggression was measured via an evaluation of a fictitious third person, designed after the measure used by DeWall, Twenge, Gitter and Baumeister (2009). Participants are told to read and respond to an essay, reportedly written by another participant from another study. The contents of the essay were adapted from the Donald paragraph used in Srull and Wyer (1979), in which a person's neutral behavior is described and can be perceived as either assertive or hostile. Consistent with previous research (Akrami, et al., 2006; Legault, Green-Demers, & Eadie, 2009), Donald was renamed and gender was matched to that of the participant's (i.e., Mike, Sara). The essay includes the following:

I ran into an old friend Lisa the other day, and she came over and visited me, since by coincidence we live in the same apartment complex. Right after she arrived, a salesman knocked at the door, but I wouldn't let him come in. I also told Lisa that I refused to pay my rent until my landlord repaints my apartment. Me and Lisa talked for a while, had lunch, and then went out for a ride. We used Lisa's car since my car broke down that morning, and I told the garage mechanic that I would have to go somewhere else if he couldn't fix my car that same day. We went to the park for about an hour and then stopped at a grocery store. I bought a mechanical toothbrush but had to get my money back right away from the clerk because it wasn't the right one. I couldn't find what I was looking for, so we left and walked a few blocks to another store. The Red Cross had set up a stand by the door and asked us to donate blood. I lied by saying that I had diabetes and therefore couldn't give blood. It's funny that I hadn't noticed it before, but when we got to the store, we found that it had gone out of business. It was getting kind of late, so Lisa took me to pick up my car (which was finally ready) and we agreed to meet again as soon as possible.

Participants rate their impression of the author on an 11-point Likert scale from 0 (does not describe the author of the essay at all) to 10 (describes the author of the essay very well), on a series of adjectives related to hostility (i.e., angry, hostile, dislikable, unfriendly). Participants were asked to evaluate the author of the essay as if they were applying to work in the lab as a research assistant. Participants were then given a candidate evaluation form where they could rate the author from 1 (strongly disagree) to

10 (strongly agree) on 10 statements (e.g., “The applicant would be a dependable employee”). Scores were reverse-coded for ease of interpretation. Composite scores were created by summing the 10 responses, with higher scores indicating a negative evaluation and high indirect aggression, and lower scores indicating a positive evaluation and low indirect aggression. The composite score can be considered a measure of indirect aggression because the participant was given the opportunity to negatively affect the applicant in a covert manner (Coyne, Archer, & Eslea, 2004). This internal reliability of the 10 statements has shown to be adequate ($\alpha = .96$). This measure has been used to assess indirect aggression among undergraduate students and has shown to be a valid measure, in that it was manipulated by social exclusion; a variable believed to predict indirect aggression (DeWall et al., 2009). Current study internal reliability, $\alpha = .95$.

Direct Aggression. The Point Subtraction Aggression Paradigm (PSAP), originally developed by Cherek (1981), was used to measure state direct aggression in the laboratory setting. To complete this measure, participants were paired with a fictitious person and completed a computerized game, with the goal of gaining as many points as possible. The participants have their own points taken away by the fictitious partner throughout the task and can respond by stealing points from their partner. The points stolen are not added to their own point counter, thus stealing points are inferred as aggression toward the partner. The traditional PSAP measure includes multiple sessions however the one-session PSAP, meaning the measure is assessed in one sitting, has shown to retain the key advantages of the PSAP and has satisfactory construct validity (Golomb et al., 2007). Expected sex differences consistent with the literature on aggression have been shown with the PSAP, with men responding more aggressively

than women (Carré, Putnam, & McCormick, 2009). Aggressive responses in the laboratory have been found to be directly related to violent criminal history and violent participants also have been found to respond significantly more aggressively than non violent participants (Cherek, Moeller, Schnapp & Dougherty, 1997).

CHAPTER III

RESULTS

IBM SPSS Statistics for Windows, Version 21.0 was used to conduct the proposed analyses. Before analyses were conducted, data were cleaned and six missing data points were labeled as missing. Linear regression assumptions were checked and histograms, boxplots, and Q-Q plots were used to assess normality, skewness and kurtosis. Assumptions of residuals were also checked (i.e., homoscedasticity, independence, normality, multivariate outliers, multicollinearity). Discrepancy values revealed one multivariate outlier. The case was examined and the extreme outlier was Winsorized to be within the three interquartile range (Barnet & Lewis, 1994). Prior to performing analyses, individual-level factors measured at baseline were assessed to ensure there were no differences between groups on alcohol use and dispositional aggression. Groups did not differ in terms of alcohol use, $t(46) = .729$ $p = .470$, or dispositional aggression, $t(46) = .631$, $p = .531$. The results of correlations between variables, means and standard deviations can be found in Table 1.

Table 1

Correlations, Means, and Standard Deviations of Variables

	1.	2.	3.	4.	5.	6.	7.	<i>M</i>	<i>SD</i>
1.Condition	---						---		---
2.Alcohol Use	-.107	---					15.17		9.35
3. DA	-.093	-.076	---				33.19		31.09
4. Indirect Aggression	.140	.073	.207	---			102.73		14.17
5. Direct Aggression	.201	.119	.115	.246	---		49.85		38.80
6.Aggression Expectancy <i>T1</i>	.156	.041	.350*	.064	.159	---	12.46		3.49
7.Aggression Expectancy <i>T2</i>	.081	.005	.415**	.036	.260	.721***	---	11.89	3.84

* $p < .05$. ** $p < .01$. *** $p < .001$.

Note. Condition: 0 = Control, 1 = Experimental. DA = Dispositional Aggression. *T1* = Expectancy assessed prior to manipulation. *T2* = Expectancy assessed post manipulation.

Analyses

Aim 1. To test that exposure to alcohol-related cues in the simulated bar condition, as opposed to the neutral context, would predict increased aggression (i.e., direct, indirect), hierarchical regressions with two predictor variables were conducted. Trait aggression was entered as the first step in the regression and experimental condition (i.e., 0 = *neutral context*, 1 = *alcohol prime environment*) was entered in the second step.

Hypothesis 1. It was hypothesized that exposure to alcohol-related cues in the simulated bar condition, as opposed to the neutral context, would predict increased direct aggression (i.e., points stolen). Results revealed that experimental condition did not significantly increase direct aggression above and beyond the effect of trait aggression, $B = .21$, $SE = 11.20$, $p = .149$ partial $r^2 = .046$, 95% CI [-6.13, 38.97]. See Table 2.

Hypothesis 2. It was hypothesized that exposure to alcohol-related cues in the simulated bar condition, as opposed to the neutral context, would predict increased indirect aggression. Results revealed that experimental condition did not significantly increase indirect aggression (i.e., candidate evaluation) above and beyond the effect of trait aggression, $B = .16$, $SE = 4.07$, $p = .272$, partial $r^2 = .026$, 95% CI [-3.67, 12.71]. See Table 2.

Table 2

Standardized Regression Coefficients for Dispositional Aggression and Experimental Condition on Aggression

Regression and Predictors	<i>B</i>	<i>SE</i>	<i>p</i>	partial r^2
Direct Aggression				
DA	.13	.18	.357	.02
Condition	.21	11.42	.149	.05
Indirect Aggression				
DA	.22	.07	.132	.05
Condition	.16	4.07	.272	.03

Note. DA = Dispositional Aggression. Condition: 0 = Control, 1 = Experimental.

Aim 2. To test the influence of context on aggression as explained through activation of aggression expectancies, mediation analyses were conducted. Experimental condition was entered as the predictor variable and alcohol-related aggression expectancies was entered as the mediating variable. The indirect effect is considered significant if the predictor variable exerts an indirect effect on the dependent variable through the mediating variable (Hayes, 2009). The significance of the indirect effect was intended to be tested using nonparametric bootstrapping analyses. Bootstrapping uses an empirically estimated sampling distribution of the mediator. In these analyses, mediation is significant if the 95% bias corrected and accelerated confidence intervals for the indirect effect based on 1000 bootstrapped samples do not include zero (Preacher & Hayes, 2004).

Hypothesis 3. It was hypothesized that exposure to an alcohol-related prime (i.e., simulated bar) would elicit one's alcohol-related aggression expectancies, which would positively predict direct aggression (i.e., points stolen). Results indicated that the indirect effect of aggression expectancies on the relationship between experimental condition and direct aggression was not significant, $B = .25$, $SE = 1.46$, $p = .094$, partial $r^2 = .063$, 95% CI [-.45, 5.45]. As expectancies did not significantly mediate the relationship, the effect was not tested using nonparametric bootstrapping. See Table 3.

Hypothesis 4. It was hypothesized that exposure to an alcohol-related prime (i.e., simulated bar) would elicit one's alcohol-related aggression expectancies, which would positively predict indirect aggression (i.e., candidate evaluation). Results indicated that the indirect effect of aggression expectancies on the relationship between experimental condition and indirect aggression was not significant, $B = .03$, $SE = .55$, $p = .859$, partial

$r^2=.00$, 95% CI [-1.01, 1.21]. Nonparametric bootstrapping was not conducted because the indirect effect was not significant. See Table 3.

Table 3

Standardized Regression Coefficients for the Mediating Effect of Aggression Expectancies on Experimental Condition and Aggression

Regression and Predictors	<i>B</i>	<i>SE</i>	<i>p</i>	partial r^2
Direct Aggression				
Condition	.17	11.19	.241	.03
Expectancy	.25	1.46	.094	.06
Indirect Aggression				
Condition	.11	4.21	.457	.01
Expectancy	.03	.55	.859	.00

Note. DA = Dispositional Aggression. Condition: 0 = Control, 1 = Experimental.

Aim 3. To test that alcohol quantity would impact the relationship between experimental condition (i.e., 0 = *neutral context*, 1 = *alcohol environment*) and aggression (i.e., direct, indirect), moderation analyses were conducted. Although moderation analyses would not typically be conducted because experimental condition was found to not significantly predict aggression (see aim 1), analyses were conducted to fulfill the aims of the current study. In these analyses, experimental condition (i.e., 0 = *neutral context*, 1 = *alcohol environment*) was entered as the predictor variable, and typical alcohol quantity, the moderating variable, was centered to reduce multicollinearity. Experimental condition and the centered alcohol quantity variable were multiplied to create the interaction term. A significant interaction term indicates that the predictive influence of experimental condition on the outcome variable is dependent upon one's level of alcohol consumption.

Hypothesis 5. It was hypothesized that alcohol quantity would moderate the relationship between alcohol-related context (i.e., simulated bar) and direct aggression (i.e., points stolen). Results indicated that alcohol quantity did not significantly moderate the relationship between experimental condition and direct aggression, $B = .18$, $SE = 1.21$, $p = .386$, partial $r^2 = .02$, 95% CI [-1.38, 3.50]. See Table 4.

Hypothesis 6. It was hypothesized that alcohol quantity would moderate the relationship between alcohol-related context (i.e., simulated bar) and indirect aggression (candidate evaluation). Results indicated that alcohol quantity did not significantly moderate the relationship between experimental condition and indirect aggression, $B = -.11$, $SE = .45$, $p = .605$, partial $r^2 = .006$, 95% CI [-1.15, .68]. See Table 4.

Table 4

Standardized Regression Coefficients for Experimental Condition, Alcohol Use, and their Interaction on Aggression

Regression and Predictors	<i>B</i>	<i>SE</i>	<i>p</i>	partial r^2
Direct Aggression				
Condition	.22	11.23	.143	.05
Alcohol Quantity	.02	.85	.937	.00
Condition X Alcohol	.18	1.21	.386	.02
Indirect Aggression				
Condition	.15	4.20	.32	.02
Alcohol Quantity	.17	.32	.432	.01
Condition X Alcohol	-.11	.45	.605	.01

Note. DA = Dispositional Aggression. Condition: 0 = Control, 1 = Experimental.

Table 5

Standardized Regression Coefficients for Condition on Aggression Expectancies, Direct Aggression, and Indirect Aggression

Regression and Predictors	<i>B</i>	<i>SE</i>	<i>p</i>	partial r^2
Condition				
Expectancies	.08	1.14	.586	.01
Direct Aggression	.20	11.13	.172	.04
Indirect Aggression	.14	4.11	.343	.02

Note. Condition: 0 = Control, 1 = Experimental. Expectancies = Aggression expectancies post-manipulation.

CHAPTER IV

DISCUSSION

The present study represented the first to experimentally test the effect of alcohol-related context on direct and indirect aggression through its effect on alcohol-related aggression expectancies. Overall, it was predicted that exposure to an alcohol-related prime (i.e., bar environment) would elicit one's aggression expectancies. In turn, aggression expectancies were expected to predict direct and indirect aggression. Lastly, it was predicted that typical alcohol quantity would moderate these relationships, such that the strength of influence of the bar environment on aggression would be greater for those who report consuming greater levels of alcohol.

Aim 1: Alcohol-related Context and Aggression

The first aim of the present study was to test the influence of an alcohol-relevant context (i.e., simulated bar vs. neutral context) on forms of aggression (i.e., direct and indirect aggression). Previous literature indicates that alcohol primes (i.e., alcohol words, alcohol images) predict increased hostility perception (Bartholow & Heinz, 2006) and critical evaluations of others (Friedman et al., 2007). The present study sought to extend our understanding of the alcohol prime-aggression relationship. It was hypothesized that exposure to an alcohol environmental context would predict direct and indirect aggression, above and beyond the influence of dispositional aggression. Overall, exposure to the simulated bar environment did not increase aggressive behavior (i.e., direct and indirect aggression). The lack of significant findings may be explained by the priming effect of the bar environment. A more extensive discussion of the priming of the bar environment will be reviewed in aim 2, however the effect size of exposure to

experimental condition on aggression (i.e., direct, indirect) was lower than expected.

This result may indicate that the bar environment was not a sufficient prime of aggression, or more likely, it may indicate that more participants are needed to achieve the necessary power of the effect.

Direct aggression. Findings indicated that exposure to the alcohol prime of the bar environment did not result in greater direct aggression. This null finding is inconsistent with prior research. The bar context has shown previously to relate to increased aggression (Wells & Graham, 2003; Wells, Graham, Speechley, & Koval, 2005). Although a significant effect was not detected, analyses of group differences revealed a positive trend between the bar environment and direct aggression. Specifically, individuals exposed to the simulated bar, as compared to those in the control condition, engaged in relatively more direct aggression. The goal of the computerized game that was used to measure direct aggression was to gain as many points as possible. Points “stolen” from the opponent did not benefit the participant’s point counter. Despite not benefiting from stolen points, individuals who were exposed to the bar environment stole an average of 58 points, while individuals in the control condition context stole an average of 43 points. A priori power analyses indicated that approximately 120 people would be needed to detect the medium effect of the bar environment on direct aggression. The current effect size of *partial* $r^2 = .04$ is considered a small effect (Ferguson, 2009). The small sample size in the current study may have resulted in insufficient power to detect a significant effect.

Indirect aggression. Findings indicated that exposure to the alcohol prime did not result in increased indirect aggression. Previous literature has found alcohol primes,

such as alcohol-related words and images, to increase hostility ratings and critical evaluations of others (Friedman et al., 2007; Subra et al., 2010). The current study sought to extend this by testing the effect of exposure to a simulated bar environment on indirect aggression. The lack of significant findings may in part be explained by the measure of indirect aggression utilized in the present study. One reason there was not an effect of the bar environment on indirect aggression may be because participants in the present study did not have an established relationship with the author of the paragraph. Indirect aggression is described as involving peer relationships (Archer, & Coyne, 2005), thus, an indirect aggression measure in which the participant has an established relationship with the victim would be ideal. Again, though the finding was not significant, individuals in the experimental condition, compared to those in the control condition, engaged in slightly greater indirect aggression. More participants are needed to achieve the desired power of the effect. Overall, the discrepancy of the current findings with previous research may be related to differences in sample size, measurement, and the type of observation involved.

Aim 2: Alcohol-aggression Expectancies and Aggression

The second aim of the study sought to test the effect of exposure to an alcohol-related prime on direct and indirect aggression via alcohol-related aggression expectancies. Research has found that alcohol consumption predicts physical aggression only for those who support the belief that alcohol causes aggression (Smucker Barnwell et al., 2006). Additionally, experimental research supports that exposure to a naturalistic bar setting elicits alcohol-related aggression expectancies (Wall et al., 2001). Thus, the

author hypothesized that aggression expectancies would mediate the association between experimental condition context and aggression (i.e., direct, indirect).

Expectancies and direct aggression. Although aggression expectancies were theorized to mediate the relationship between experimental condition and direct aggression, current study findings did not support this hypothesis. The null finding is inconsistent with the alcohol expectancy theory literature (Goldman et al., 1999) which suggests that alcohol-related aggression is a result of the individual's beliefs about the effects of alcohol. In other words, an individual is more likely to become aggressive after drinking if they believe that alcohol causes aggression. Alcohol-related cues have been shown to predict alcohol expectancies (Lau-Barraco & Dunn, 2009; Weingardt et al., 1996), and the current experimental condition was created to replicate bar environments that have successfully elicited expectancies in prior studies (Wall et al., 2001). Exploratory analyses revealed that experimental condition in the current study failed to elicit increased alcohol-related aggression expectancies (see Table 5). The study effect size of $r^2 = .01$ is extremely small, and inconsistent with the medium to large effect size found in previous literature (Lau-Barraco & Dunn, 2009). The current study sample of 48 is far lower than the proposed sample of approximately 120 participants. Based on a priori power analyses, a larger sample size would be needed to detect the effect of the bar environment on aggression expectancies.

Expectancies and indirect aggression. Similar to direct aggression, aggression expectancies did not mediate the relationship between experimental condition and indirect aggression. It was hypothesized that exposure to the bar environment would elicit aggression expectancies, which in turn, were hypothesized to increase the

likelihood that an individual would indirectly aggress against another. Findings did not support the hypothesized associations. As discussed earlier, though previous literature suggests that alcohol primes such as alcohol-related words and images increase hostility ratings and critical evaluations of others (Friedman et al., 2007; Subra et al., 2010), the alcohol prime used in the current study was not found to significantly elicit aggression expectancies, and consequently, indirect aggression.

The relationship between aggression expectancies and indirect aggression warrant further investigation in future research. Current alcohol-related aggression expectancies reflect what a typical drinker considers aggressive behaviors, such as “alcohol will make me more powerful.” These beliefs may represent an individual’s expectation of physical aggression rather than indirect aggression. As the current study did not obtain the necessary sample size to determine whether aggression expectancies primed by the bar environment are appropriate in the prediction of indirect aggression, future research may wish to explore these relationships. Perhaps expectancies that are related specifically to indirect aggression will need to be established using focus groups and further verified with psychometric analysis.

Aim 3: Typical Alcohol Use as a Moderator

The third aim of the study tested one’s drinking quantity as a potential moderator of the relationship between experimental condition and forms of aggression. Previous research has found heavy episodic drinking and alcohol quantity to be significantly associated with alcohol-related aggression (Wells & Graham, 2003; Wells et al., 2005). Thus, it was hypothesized that the influence of the alcohol-context on direct and indirect aggression would be stronger for those who report consuming greater levels of alcohol.

Findings indicated that the influence of the bar environment on both direct and indirect aggression did not differ based on one's reported level of alcohol consumption. Further, alcohol quantity was not significantly related to direct or indirect aggression, nor did experimental condition predict indirect aggression (see Tables 1 and 5). Alcohol quantity has been shown experimentally to induce both physical and verbal aggression (Bushman & Cooper, 1990; Dougherty et al., 1996; Eckhardt & Crane, 2008; Giancola, 2002; Giancola et al., 2009), thus, the aggression-inducing effect of the bar environment was proposed to be stronger for heavier drinkers. Although findings do not support this large body of literature, results may be less due to the role of alcohol consumption and more reflective of insufficient power to detect an effect of experimental condition. As previously mentioned, moderation analyses would not typically be conducted because experimental condition was found to not significantly predict aggression (see aim 1). Thus, while the hypothesis was not supported, these findings should be interpreted with caution given the lack of power to detect the primary experimental effect.

General Discussion

Overall, the current study hypotheses were not supported. Aside from low statistical power, there are other potential explanations for the lack of effect observed in the present study. Already noted above, the method of assessing indirect aggression as well as the content of the expectancies assessed may have not reflected true indirect aggression. In addition to these reasons, however, the non-significant findings may be due to the sample characteristics. Specifically, sample distribution of gender and the restriction of moderate to heavy drinkers may have affected study findings.

Study sample characteristics may have limited the strength of variable relationships. First, previous research has found men, as opposed to women, to report greater aggression expectancies when exposed to a bar environment (Wall et al., 2000). The current sample was primarily female (72.9%), thus, aggression expectancies reported in the current study may be lower than would be expected with a more equal distribution of male and female participants. Relatedly, such low aggression expectancies may not be primed by the simulated bar environment, thus subsequent aggressive behaviors may not be affected. Second, in an effort to acquire participants with established alcohol expectancies, eligible participants needed to report typically consuming at least five standard alcohol drinks per week. While consistent with prior studies on alcohol expectancies and alcohol priming (Lau-Barraco & Dunn, 2009), creating this eligibility criterion may have restricted the range of responses by limiting the responses to only social- to heavy-drinking individuals. By creating range restriction, the sample variance is much less than would be expected in a general population. This restriction reduces reliability and validity and is a strong influence on correlation coefficients (Fife, Mendoza, & Terry, 2012). Statistical equations are recommended to combat range restriction estimation issues however these corrections are not without error and often require a large sample size (Fife et al., 2012). Future research investigating the relationship between alcohol quantity and aggression should consider lowering the minimum level of typical drinking. Doing so would increase the range of respondents while also attaining the target sample of drinkers.

Future Directions

Several directions are offered to advance research in the area of aggression and alcohol use. First and foremost, the current study should be replicated with a larger sample. Attaining adequate sample size is imperative in detecting an effect and understanding the true relationships among the variables. Second, in order to understand the predictive effects of an alcohol prime on aggression, a variety of measures of aggression should be administered. Multiple measures would allow for various subtypes of aggressive responses to be assessed. For example, direct aggression may be assessed using the Taylor Aggression Paradigm (TAP; Giancola et al., 2005; Giancola et al., 2012), and evaluations of aggressive verbalizations (see Eckhardt & Crane, 2008). Further, indirect aggression may be assessed using interactions with other individuals. As opposed to participants evaluating an unknown person, confederates may be used to increase the authenticity of the indirect aggression victim. Similarly, participants could be recruited in dyads. Two participants who have an established relationship would more closely mirror situations in which indirect aggression would exist (Archer & Coyne, 2005). Another direction for future research may focus on exploring the effect of acute alcohol consumption. While the present study examined environmental context on aggression, future research may explore the predictive influence of alcohol consumption on indirect aggression. As alcohol consumption has been found to increase direct aggression, such as physical (Giancola et al., 2009) and verbal aggression (Eckhardt & Crane, 2008), a similar predictive effect may be found regarding indirect aggression. Indirect aggression is related to a variety of negative outcomes including depression, anxiety, and suicide ideation. Therapists working with individuals who experience indirect aggression may wish to address specific times when victimization is greatest,

such as while consuming alcohol. Finally, future research also may wish to investigate whether indirect aggression leads to direct aggression. Research has shown that verbal aggression may escalate to more injurious forms such as physical aggression (Buss, 1961, p. 5), however, research has not yet examined whether indirect aggression may immediately lead to direct aggression or directly aggressive responses. Findings could increase our knowledge of alcohol-related aggression in general and highlight the importance of early recognition of alcohol-related indirect aggression.

Limitations

There are several methodological limitations that should be noted. One limitation involves the experimental condition. Inconsistent with previous literature, the bar environment did not elicit increased alcohol-related aggression expectancies. The present study did not achieve the pre-determined desired sample size, and thus, may have prevented us from observing the true effect of the alcohol prime. Another limitation is the generalizability of results to non-heavy drinkers. Study inclusion criterion was the consumption of at least five standard alcohol drinks per week. Thus, findings may not be reflective of light or non-drinkers. A third limitation involves the assessment of indirect aggression. The indirect aggression measure of a candidate evaluation has been established in previous research; however future research could measure indirect aggression in a manner that more closely reflects indirect aggression as it exists outside a laboratory environment. As suggested, indirect aggression may be more appropriately measured using established dyads and/or interactions with a confederate. Finally, the baseline assessment was administered remotely via an online questionnaire. Researchers

were not available to ensure that participants were attentive to the questionnaire or to answer any questions the participants may have had.

CHAPTER V

CONCLUSIONS

The present study represented the first to experimentally test the effect of alcohol-related context on direct and indirect aggression through its effect on alcohol-related aggression expectancies. Overall, exposure to the alcohol prime of the bar environment failed to elicit aggression expectancies or forms of aggression. Additionally, alcohol quantity was not found to be related to direct or indirect aggression. The probable explanation for the non-significant findings may be related to the insufficient sample size obtained. Without adequate sample size, the study lacked the power necessary to detect the true relationships of the variables. Future studies with the ability to attain adequate power should continue to investigate alcohol-related aggression and specifically, the subtype of indirect aggression. Given the adverse effects associated with indirect aggression (e.g., anxiety, depression, suicide ideation, perfectionism, alcohol and drug use), the relationship between alcohol and indirect aggression as well as the predictive effects of alcohol consumption on indirect aggression, warrant further examination.

REFERENCES

- Abbey, A., McAuslan, P., Ross, L. T., & Zawacki, T. (1999). Alcohol expectancies regarding sex, aggression, and sexual vulnerability: Reliability and validity assessment. *Psychology of Addictive Behaviors, 13*(3), 174-182.
- Akrami, N., Ekehammar, B., & Araya, T. (2006). Category and stereotype activation revisited. *Scandinavian Journal of Psychology, 47*, 513-522.
- American Psychological Association (2002). Ethical principles of psychologists and code of conduct. *American Psychologist, 57*, 1060-1073.
- Archer, J. (2004). Sex differences in aggression in real-world settings: A meta-analytic review. *Review of General Psychology, 8*(4), 291-322.
- Archer, J. & Coyne, S. M. (2005). An integrated review of indirect, relational, and social aggression. *Personality and Social Psychology Review, 9*(3), 212-230.
- Barnet, V. & Lewis, T. (1994). Outliers in statistical data. New York: Wiley.
- Baron, R.M., & Kenny, D.A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Bartholow, B. D., & Heinz, A. (2006). Alcohol and aggression without consumption: Alcohol cues, aggressive thoughts, and hostile perception bias. *Psychological Science, 17*, 30-37.
- Bjorkqvist, K., Osterman, K., & Kaukiainen, A. (1992). The development of direct and indirect aggressive strategies in males and females. In K. Bjorkqvist & N. Pirkko (Eds.), *Of Mice and Women: Aspects of Female Aggression*.(51-64). San Diego, CA: Academic Press, Inc.

- Bjorkqvist, K., Osterman, K., & Lagerspetz, K. M. J. (1994). Sex differences in covert aggression among adults. *Aggressive Behavior, 20*, 27-33.
- Borders, A., Smucker Barnwell, S., & Earleywine, M. (2007). Alcohol-aggression expectancies and dispositional rumination moderate the effect of alcohol consumption on alcohol-related aggression and hostility. *Aggressive Behavior, 33*, 327-338.
- Brown, L. M., Boniecki, K. A., & Walters, A. M. (2004). Intergroup flexibility and people's views of African Americans. *International Journal of Intercultural Relations, 28*, 373-398.
- Buddie, A. M., & Parks, K. A. (2003). The role of the bar context and social behaviors on women's risk for aggression. *Journal of Interpersonal Violence, 18*(12), 1378-1393.
- Bushman, B. J. & Cooper, H. M. (1990). Effects of alcohol on human aggression: An integrative research review. *Psychological Bulletin, 107*(3), 341-354.
- Buss, A. H. (1961). Aggression, anger, and hostility. *Psychology of Aggression*. New York: Wiley.
- Buss, A. H., & Perry, M. (1992). The aggression questionnaire. *Journal of Personality and Social Psychology, 63*, 452-459.
- Carré, J. M., Gilchrist, J. D., Morrissey, M. D., & McCormick, C. M. (2010). Motivational and situational factors and the relationship between testosterone dynamics and human aggression during competition. *Biological Psychology, 84*, 346-353.

- Carré, J. M., Putnam, S. K., & McCormick, C. M. (2009). Testosterone responses to competition predict future aggressive behaviour at a cost to reward in men. *Psychoneuroendocrinology*, *34*(3), 561-570.
- Cherek, D. R. (1981). Effects of smoking different doses of nicotine on human aggressive behavior. *Psychopharmacology*, *75*, 339-345.
- Cherek, D. R., Moeller, F. G., Schnapp, W., & Dougherty, D. M. (1997). Studies of violent and nonviolent male parolees: I. laboratory and psychometric measurements of aggression. *Society of Biological Psychiatry*, *41*, 514-522.
- Collins, R.L., Bradizza, C.M., & Vincent, P.C. (2007). Young-adult malt liquor drinkers: Prediction of alcohol problems and marijuana use. *Psychology of Addictive Behaviors*, *21*, 138-146. doi: 10.1037/0893-164X.21.2.138
- Collins, R.L., Koutsky, J.R., & Izzo, C.V. (2000). Temptation, restriction, and the regulation of alcohol intake: Validity and utility of the Temptation and Restraint Inventory. *Journal of Studies on Alcohol*, *61*, 766-773.
- Collins, R.L., & Lapp, W.M. (1992). The Temptation and Restraint Inventory for measuring drinking restraint. *British Journal of Addiction*, *87*, 625-633. doi: 10.1111/j.1360-0443.1992.tb01964.x
- Collins, R. L., Parks, G. A., & Marlatt, G. A. (1985). Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology*, *53*(2), 189-200.

- Conway, K. P., Swendsen, J. D., & Merikangas, K. R. (2003). Alcohol expectancies, alcohol consumption, and problem drinking: The moderating role of family history. *Addictive Behaviors, 28*, 823-836.
- Coyne, S. M., Archer, J., & Eslea, M. (2006). "We're not friends anymore! Unless...": The frequency and harmfulness of indirect, relational, and social aggression. *Aggressive Behavior, 32*, 294-307.
- Coyne, S. M., Archer, J., & Eslea, M. (2004). Cruel intentions on television and in real life: Can viewing indirect aggression increase viewers' subsequent indirect aggression? *Journal of Experimental Child Psychology, 88*, 234-253.
- Dougherty, D. M., Bjork, J. M., Bennett, R. H., & Moeller, F. G. (1999). The effects of a cumulative alcohol dosing procedure on laboratory aggression in women and men. *Journal of Studies on Alcohol and Drugs, 60*(3), 322.
- Dougherty, D. M., Cherek, D. R., & Bennett, R. H. (1996). The effects of alcohol on the aggressive responding of women. *Journal of Studies on Alcohol, 57*(2), 178.
- Eckhardt, C. I., & Crane, C. (2008). Effects of alcohol intoxication and aggressivity on aggressive verbalizations during anger arousal. *Aggressive Behavior, 34*, 428-436.
- Ferguson, C. J. (2009). An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice, 40*(5), 532-538.
- Fife, D. A., Mendoza, J. L., & Terry, R. (2012). The assessment of reliability under range restriction: A comparison of α , ω , and test-retest reliability for dichotomous data. *Educational and Psychological Measurement, 72*(5), 862-888.

- Forrest, S., Eatough, V., & Shevlin, M. (2005). Measuring adult indirect aggression: The development and psychometric assessment of the indirect aggression scales. *Aggressive Behavior, 31*, 84-97.
- Friedman, R. S., McCarthy, D. M., Bartholow, B. D., & Hicks, J. A. (2007). Interactive effects of alcohol outcome expectancies and alcohol cues on nonconsumptive behavior. *Experimental and Clinical Psychopharmacology, 15*(1), 102-114.
- Fromme, K., Stroot, E., & Kaplan, D. (1993). Comprehensive effects of alcohol: Development and psychometric assessment of a new expectancy questionnaire. *Psychological Assessment, 5*, 19-26.
- Giancola, P. R. (2002). Alcohol-related aggression in men and women: The influence of dispositional aggressivity. *Journal of Studies on Alcohol and Drugs, 63*(6), 696-709.
- Giancola, P. R., Godlaski, A., & Parrott, D. J. (2005). "So I can't blame the booze?": Dispositional aggressivity negates the moderating effects of expectancies on alcohol-related aggression. *Journal of Studies on Alcohol, 66*, 815-824.
- Giancola, P. R., Godlaski, A. J., & Roth, R. M. (2012). Identify component-processes of executive functioning that serve as risk factors for the alcohol-aggression relation. *Psychology of Addictive Behaviors, 26*(2), 201-211.
- Giancola, P. R., Levinson, C. A., Corman, M. D., Godlaski, A. J., Morris, D. H., Phillips, J. P., & Holt, J. C. D. (2009). Men and women, alcohol and aggression. *Experimental and Clinical Psychopharmacology, 17*(3), 154-164.
- Gibb, B. E., & Abela, J. R. Z. (2008). Emotional abuse, verbal victimization, and the

development of children's negative inferential styles and depressive symptoms.

Cognitive Therapy and Research, 32, 161-176.

Goldman, M. S., Del Boca, F. K., & Darkes, J. (1999). Alcohol expectancy theory: The application of cognitive neuroscience. In K. E. Leonard & H. T. Blane (Eds.), *Psychological Theories of Drinking and Alcoholism* (203-246). New York, NY: The Guilford Press.

Golomb, B. A., Cortez-Perez, M., Jaworski, B. A., Mednick, S., & Dimsdale, J. (2007). Point subtraction aggression paradigm: Validity of a brief schedule of use. *Violence and Victims*, 22(1), 95-103.

Graham, K., Bernards, S., Osgood, D. W., & Wells, S. (2006). Bad nights or bad bars? Multi-level analysis of environmental predictors of aggression in late-night large-capacity bars and clubs. *Society for the Study of Addiction*, 101, 1569-1580.

Graham, K., & Wells, S. (2001). Aggression among young adults in the social context of the bar. *Addiction Research & Theory*, 9(3), 193-219.

Graham, K., West, P., & Wells, S. (2000). Evaluating theories of alcohol-related aggression using observations of young adults in bars. *Addiction*, 95(6), 847-863.

Gussler-Burkhardt, N. L., & Giancola, P. R. (2005). A further examination of gender differences in alcohol-related aggression. *Journal of Studies on Alcohol*, 66, 413-422.

Ham, L. S., Stewart, S. H., Norton, P. J. & Hope, D. A. (2005). Psychometric assessment of the comprehensive effects of alcohol questionnaire: Comparing a brief version to the original full scale. *Journal of Psychopathology and Behavioral Assessment*, 27, 141-158.

- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408-420.
- Hess, N. H., & Hagen, E. H. (2006). Sex differences in indirect aggression psychological evidence from young adults. *Evolution and Human Behavior*, 27, 231-245.
- Hoaken, P. N. S., & Pihl, R. O. (2000). The effects of alcohol intoxication on aggressive responses in men and women. *Alcohol & Alcoholism*, 35(5), 471-477.
- Hughes, K., Quigg, Z., Eckley, L., Bellis, M., Jones, L., Calafat, A., Kosir, M., & van Hasselt, N. (2011). Environmental factors in drinking venues and alcohol-related harm: The evidence base for European intervention. *Addiction*, 106, 37-46.
- IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.
- Kaukiainen, A., Bjorkqvist, K., Lagerspetz, K., Osterman, K., Salmivalli, C., Rothberg, S., & Ahlbom, A. (1999). The relationships between social intelligence, empathy, and three types of aggression. *Aggressive Behavior*, 25(2), 81-89.
- Langton, L., Berzofsky, M., Krebs, C., & Smiley-McDonald, H. (2012). Victimization not reported to the police, 2006-2012. *U.S. Department of Justice Special Report*, 1-17. Retrieved from www.ojp.usdoj.gov
- Lau-Barraco, C., & Dunn, M. E. (2009). Environmental context effects on alcohol cognitions and immediate alcohol consumption. *Addiction Research and Theory*, 17(3), 306-314.
- Leenaars, L., & Lester, D. (2011). Indirect aggression and victimization are positively associated in emerging adulthood: The psychological functioning of indirect aggressors and victims. *Journal of College Student Development*, 52(1), 62-76.

- Legault, L., Green-Demers, I., & Eadie, A. L. (2009). When internalization leads to automatization: The role of self-determination in automatic stereotype suppression and implicit prejudice regulation. *Motivation and Emotion, 33*, 10-24.
- Leonard, K. E., Collins, R. L., & Quigley, B. M. (2003). Alcohol consumption and the occurrence and severity of aggression: An event-based analysis of male to male barroom violence. *Aggressive Behavior, 29*, 346-365.
- Lewis, B. A. & O'Neill, H. K. (2000). Alcohol expectancies and social deficits relating to problem drinking among college students. *Addictive Behaviors, 25*(2), 295-299.
- Lit, M. D., & Cooney, N. L. (1999). Inducing craving for alcohol in the laboratory. *Alcohol Research & Health, 23*(3), 174-178.
- MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation Analysis. *Annual Review of Psychology, 58*, 593-614.
- Marks, A. D. G., Hine, D. W., Manton, G. C., & Thorsteinsson, E. B. (2012). Can outcome expectancies help explain sex differences in direct and indirect aggression? *Journal of Applied Social Psychology, 42*(1), 151-169.
- McFarlin, S. K., Fals-Stewart, W., Major, D. A., & Justice, E. M. (2001). Alcohol use and workplace aggression: An examination of perpetration and victimization. *Journal of Substance Abuse, 13*, 303-321.
- Monk, R. L., & Heim, D. (2013). A critical systematic review of alcohol-related outcome expectancies. *Substance Use & Misuse, 48*, 539-557.
- Moroschan, G., Hurd, P. L., Nicoladis, E. (2009). Sex differences in the use of indirect aggression in adult Canadians. *Evolutionary Psychology, 7*(1), 146-159.

- Parks, K. A., Hsieh, Y., Bradizza, C. M., & Romosz, A. M. (2008). Factors influencing the temporal relationship between alcohol consumption and experiences with aggression among college women. *Psychology of Addictive Behaviors, 22*(2), 210-218.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*, 717-731.
- Quigley, B. M., Corbett, A. B., & Tedeschi, J. T. (2002). Desired image of power, alcohol expectancies and alcohol-related aggression. *Psychology of Addictive Behaviors, 16*(4), K.318-324.
- Quigley, B. M. & Leonard, K. E. (2006). Alcohol expectancies and intoxicated aggression. *Aggression and Violent Behavior, 11*, 484-496.
- Rand, M. R., Sabol, W. J., Sinclair, M., & Snyder, H. N. (2010). Alcohol and crime: Data from 2002 to 2008. *Bureau of Justice Statistics*. Retrieved from http://bjs.ojp.usdoj.gov/content/acf/25_crimes_by_knownoffenders.cfm
- Richardson, D. R., & Green, L. R. (1999). Social sanction and threat explanations of gender effects on direct and indirect aggression. *Aggressive Behavior, 25*, 425-434.
- Rolfe, A., Dalton, S., Krishnan, M., Orford, J., Mehdikhani, M., Cawley, J., & Ferrins-Brown, M. (2006). Alcohol, gender, aggression and violence: Findings from the Birmingham untreated heavy drinkers project. *Journal of Substance Use, 11*(5), 343-358.
- Smucker Barnwell, S., Borders, A., & Earleywine, M. (2006). Alcohol-aggression

- expectancies and dispositional aggression moderate the relationship between alcohol consumption and alcohol-related violence. *Aggressive Behavior*, 32, 517-527.
- Storch, E. A., Bagner, D. M., Geffken, G. R., & Baumeister, A. L. (2004). Association between overt and relational aggression and psychosocial adjustment. *Violence and Victims*, 19(6), 689-700.
- Subra, B., Muller, D., Begue, L., Bushman, B. J., & Delmas, F. (2010). Automatic effects of alcohol and aggressive cues on aggressive thoughts and behaviors. *Personality and Social Psychology Bulletin*, 36(8), 1052-1057.
- Tremblay, P. F., Mihic, L., Graham, K., & Jelley, J. (2007). Role of motivation to respond to provocation, the social environment, and trait aggression in alcohol-related aggression. *Aggressive Behavior*, 33, 389-411.
- Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of Personality and Social Psychology*, 81(6), 1058-1069.
- Vieno, A., Gini, G., & Santinello, M. (2011). Different forms of bullying and their association to smoking and drinking behavior in Italian adolescents. *Journal of School Health*, 81(7), 393-399.
- Wall, A. M., McKee, S. A., & Hinson, R. E. (2000). Assessing variation in alcohol outcome expectancies across environmental context: An examination of the situational specificity hypothesis. *Psychology of Addictive Behaviors*, 14(4), 367-375.

- Wall, A. M., McKee, Hinson, R. E., & Goldstein, A. (2001). Examining alcohol outcome expectancies in laboratory and naturalistic bar settings: A within-subject experimental analysis. *Psychology of Addictive Behaviors, 15*(3), 219-226.
- Wall, A. M., Thrussell, C., & Lalonde, R. N. (2003). Do alcohol expectancies become intoxicated outcomes? A test of social-learning theory in a naturalistic bar setting. *Addictive Behaviors, 28*, 1271-1283.
- Wang, J., Iannotti, R. J., & Nansel, T. R. (2009). School bullying among adolescents in the United States: Physical, verbal, relational, and cyber. *Journal of Adolescent Health, 45*(4), 368-375.
- Warren, G. C., & Clarbour, J. (2009). Relationship between psychopathy and indirect aggression use in a noncriminal population. *Aggressive Behavior, 35*, 408-421.
- Warren, P., Richardson, D. S., McQuillin, S. (2011). Distinguishing among nondirect forms of aggression. *Aggressive Behavior, 37*(4), 291-301.
- Weingardt, K. R., Stacy, A. W., & Leigh, B. C. (1996). Automatic activation of alcohol concepts in response to positive outcomes of alcohol use. *Alcoholism: Clinical and Experimental Research, 20*(1), 25-30.
- Wells, S., & Graham, K. (2003). Aggression involving alcohol: Relationship to drinking patterns and social context. *Society for the Study of Addiction to Alcohol and Other Drugs, 98*, 33-42.
- Wells, S., Graham, K., Speechley, M., & Koval, J. J. (2005). Drinking patterns, drinking contexts and alcohol-related aggression among late adolescent and young adult drinkers. *Society for the Study of Addiction, 100*, 933-944.

Zamboanga, B. L., Schwartz, S. J., Ham, L. S., Jarvis, L. H., & Olthuis, J. V. (2009). Do alcohol expectancy outcomes and valuations mediate peer influences and lifetime alcohol use among early adolescents? *The Journal of Genetic Psychology, 170*(4), 359-376.

APPENDIX A**DEMOGRAPHIC QUESTIONNAIRE**

- 1) How old are you? _____

- 2) What is your student class (circle one)?
 - a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior
 - e. Graduate student
 - f. Other (please specify): _____

- 3) What is your gender?
 - a. Female
 - b. Male

- 4) What is your living situation?
 - a. On-campus
 - b. Off-campus

- 5) What is your race?
 - a. African American/Black
 - b. Caucasian/White
 - c. Asian
 - d. Hispanic
 - e. Native Hawaiian or Other Pacific Islander
 - f. Native American or Alaskan Native
 - g. Other (please specify): _____

- 6) Are you currently a member of a fraternity or sorority on campus?
 - a. Yes
 - b. No

- 7) What is your height?
_____ feet, _____ inches

- 8) What is your weight?
_____ pounds

- 9) Yearly Individual Income:
 - a. Under \$10,000
 - b. \$10,000 - \$20,000
 - c. \$20,001 - \$40,000
 - d. \$40,001 - \$60,000

- e. \$60,001 - \$80,000
- f. \$80,000 - \$100,000
- g. \$100,000 or more

10) What is your relationship status?

- a. Single/never married
- b. Living with partner
- c. Married
- d. Separated/Divorced
- e. Widowed

11) Are you employed now?

- a. Yes, part-time only
- b. Yes, full and part-time
- c. Yes, full time only
- d. No

12) What is your current overall GPA?

APPENDIX B

DISPOSITIONAL AGGRESSION QUESTIONNAIRE

Please rate each of the following items in terms of how characteristic they are of you. Use the following scale for answering these items.

		Extremely Unlike Me			Extremely Like Me			
		1	2	3	4	5	6	7
1.	Once in a while I can't control the urge to strike another person.	1	2	3	4	5	6	7
2.	Given enough provocation, I may hit another person.	1	2	3	4	5	6	7
3.	If somebody hits me, I hit back.	1	2	3	4	5	6	7
4.	I get into fights a little more than the average person.	1	2	3	4	5	6	7
5.	If I have to resort to violence to protect my rights, I will.	1	2	3	4	5	6	7
6.	There are people who pushed me so far that we came to blows.	1	2	3	4	5	6	7
7.	I can think of no good reason for ever hitting a person.	1	2	3	4	5	6	7
8.	I have threatened people I know.	1	2	3	4	5	6	7
9.	I have become so mad that I have broken things.	1	2	3	4	5	6	7
10.	I tell my friends openly when I disagree with them.	1	2	3	4	5	6	7
11.	I often find myself disagreeing with people.	1	2	3	4	5	6	7
12.	When people annoy me, I may tell them what I think of them.	1	2	3	4	5	6	7
13.	I can't help getting into arguments when people disagree with me.	1	2	3	4	5	6	7
14.	My friends say that I'm somewhat argumentative.	1	2	3	4	5	6	7
15.	I flare up quickly but get over it quickly.	1	2	3	4	5	6	7

- | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|
| 16. | When frustrated, I let my irritation show. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. | I sometimes feel like a powder keg ready to explode. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. | I am an even-tempered person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. | Some of my friends think I'm a hothead. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. | Sometimes I fly off the handle for no good reason. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. | I have trouble controlling my temper. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. | I am sometimes eaten up with jealousy. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. | At times I feel I have gotten a raw deal out of life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. | Other people always seem to get the breaks. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. | I wonder why sometimes I feel so bitter about things. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. | I know that "friends" talk about me behind my back. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. | I am suspicious of overly friendly strangers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. | I sometimes feel that people are laughing at me behind me back. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. | When people are especially nice, I wonder what they want. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

APPENDIX C

ALCOHOL USE QUESTIONNAIRE

Please think about your typical drinking over the **PAST 3 MONTHS**. On a typical day, how many drinks would you have, and over how many hours would you have them? That is, how many drinks would you typically have on each day in the 3 months? How long (in hours) would a typical drinking occasion last on that day? Use any applicable number, starting with 0, and please note that each space must be filled in.

NOTE: 1 drink = 1 Beer (12 oz.) = 1 Wine Cooler (12 oz.) = 1 Glass of Wine (5 oz.) = 1 Shot of Liquor (1-1.5 oz.) = 1 Mixed Drink (1-1.5 oz. of liquor)

Over the **PAST 3 MONTHS**, on a....

	Typical Monday	Typical Tuesday	Typical Wednesday	Typical Thursday	Typical Friday	Typical Saturday	Typical Sunday
Number of Drinks							
Number of Hours							

APPENDIX D

ALCOHOL EXPECTANCY QUESTIONNAIRE

The following section assesses what you would expect to happen **if you were under the influence of alcohol.**

Check from disagree to agree – depending on whether you expect the effect to happen to you if you were under the influence of alcohol. These effects will vary, depending upon the amount of alcohol you typically consume.

This is not a personality assessment. We want to know what you expect to happen if you were to drink alcohol, not how you are when you are sober. Example: If you are always emotional, you would not check agree as your answer unless you expected to become MORE EMOTIONAL if you drank.

If I were under the influence from alcohol:

	Disagree	Slightly disagree	Slightly agree	Agree
1. I would be outgoing	_____	_____	_____	_____
2. My senses would be dulled	_____	_____	_____	_____
3. I would be humorous	_____	_____	_____	_____
4. My problems would seem worse	_____	_____	_____	_____
5. It would be easier to express my feelings	_____	_____	_____	_____
6. My writing would be impaired	_____	_____	_____	_____
7. I would feel sexy	_____	_____	_____	_____
8. I would have difficulty thinking	_____	_____	_____	_____
9. I would neglect my obligations	_____	_____	_____	_____
10. I would be dominant	_____	_____	_____	_____
11. My head would feel fuzzy	_____	_____	_____	_____
12. I would enjoy sex more	_____	_____	_____	_____
13. I would feel dizzy	_____	_____	_____	_____
14. I would be friendly	_____	_____	_____	_____
15. I would be clumsy	_____	_____	_____	_____

16. It would be easier to act out my fantasies _____
17. I would be loud, boisterous, or noisy _____
18. I would feel peaceful _____
19. I would be brave and daring _____
20. I would feel unafraid _____
21. I would feel creative _____
22. I would be courageous _____
23. I would feel shaky or jittery the next day _____
24. I would feel energetic _____
25. I would act aggressively _____
26. My responses would be slow _____
27. My body will be relaxed _____
28. I would feel guilty _____
29. I would feel calm _____
30. I would feel moody _____
31. It would be easier to talk to People _____
32. I would be a better lover _____
33. I would feel self-critical _____
34. I would be talkative _____
35. I would act tough _____
36. I would take risks _____
37. I would feel powerful _____
38. I would act sociable _____

APPENDIX E

STUDY SCRIPT

Welcome participants. Tell each participant to sit at one of the three round tables and wait for your instructions.

Once all participants are seated at a workstation, say:

“Hi, my name is _____ and I am your study administrator today. As you may remember from when you signed up on SONA, this study involves various tasks for both the alcohol research lab and human cognitions psychology lab. In order to cut down on the amount of time you’re needed in person, you completed some online survey measures about a week ago. Today, you’ll need to complete three more tasks; one for the alcohol research lab and two for the human cognitions lab.

I’m going to provide some instructions to get you started.

The first thing relates to your study ID. In the beginning of the computerized survey you will be asked to create a unique 8-digit ID number. This is NOT your SONA number. This is the same number you were to have created for the online study you already completed. It is comprised of your birth month, birth date, and the last four digits of your cell phone number. For example, if my birthday was January 2nd, and the last four digits of my cell phone were 5783, my unique ID number would be 01025783.

After providing this unique ID number, you will complete a survey for the alcohol lab. It will ask about your beliefs on alcohol use.

After completing the alcohol survey, you will then complete a task for the Cognition lab. The goal of this task is to study people’s reaction time and how that relates to playing computer games. It involves you playing a game on the computer with someone else. As you will soon read, you’ll be playing this game against an opponent in the cognition lab across the hall. The goal of the game is to assess reaction time and game play. Participants in the cognition lab are not completing some of the questions that you had to complete so they’ll already be logged on when you’re ready to play the game. All instructions you’ll need for the game will appear on your computer once you finish the alcohol measure.

After playing the computer game, you have one more task to complete for the cognition lab about judgment formation. So, basically, this is a task that looks at how we form perceptions and evaluations of others. You will be asked to read a paragraph written by an ODU student and respond to the questions that follow. We would like you to complete an evaluation of the student author as if that student were applying to work in our research lab as a research assistant. This is to give us an idea of your perception of the author and how qualified you think they would be for a research assistant job. At the end of these three tasks, you’ll complete a brief questionnaire about the tasks you’ve

participated in today. Then, raise your hand to tell me that you are finished and the research assistant will walk you to another room to debrief you about the study.

If you have any questions throughout the study, please don't hesitate to ask us – just raise your hand. If you need to take a quick break during the study, please feel free to do so. Also, please make sure you silence your cell phones.

Alright, you can go ahead and begin the first survey. Again, once you're done with all three tasks, raise your hand and we'll walk you to another room.

Thank you!"

APPENDIX F**DECEPTION QUESTIONNAIRE**

1. What do you believe the three tasks you participated in today were about?

Task 1 : _____

Task 2 : _____

Task 3 : _____

The next three questions are about the computerized game you played.

2. Please estimate the number of subjects you had been paired with today.

3. Please describe what you can about these other subjects.

4. Please estimate whether you had subtracted more or less points than the other subjects.

APPENDIX G

SHORT DEBRIEFING HANDOUT

This study is concerned with alcohol use and cognitions among college students. In this study, you were asked to perform two separate experimental tasks—a point subtraction paradigm, and a candidate evaluation of a third person.

To be clear, no one is applying for a research job and your evaluation will not affect anyone.

Findings from this study will advance our understanding of college student alcohol use and related cognitions.

All the information we collected in today's study will be kept confidential. We are not interested in any one individual's responses; we want to look at the general patterns that emerge when the data are aggregated together.

We also ask that you do not discuss this study with other students. In order to collect the most accurate information, and to maintain research integrity, it is important that participants are not aware of what we are interested in examining.

If your participation in this study has caused you concerns, anxiety, or otherwise distressed you, you may want to contact the ODU Counseling Center at (757) 683-4401.

If you have questions about your participation in this study or would like to contact the researcher, please email Brynn Sheehan, M.A., at bshee006@odu.edu

Thank you again for your participation.

APPENDIX H

FULL DEBRIEFING HANDOUT

This study is concerned with the effect of alcohol primes and alcohol-related expectancies on aggression. Previous studies have found that alcohol-related primes induce a drinker's expectancies which may subsequently affect your behavior. By viewing alcohol cues, your direct and indirect aggression may increase.

How was this tested?

In this study, you were asked to perform two separate tasks—a point subtraction paradigm, and a candidate evaluation of a third person. All participants performed these same tasks, though one group was exposed to alcohol-related cues, whereas the other group was not presented with such cues.

Deception:

There was no opponent in the point subtraction paradigm. Points stolen from you were in fact computerized and set to an interval schedule. Additionally, there was no author of the paragraph you read. No one is applying for a research job and your evaluations will not affect anyone.

Hypotheses and main questions:

We expect to find that exposure to alcohol-related cues will increase your aggression expectancies and thus increase direct and indirect aggression. When we examine aggressive responses, we expect individuals who were brought into a bar environment to express greater aggression.

We are also interested in the influence of dispositional aggression and alcohol consumption on your responses. The responses provided in the online portion of this study will be examined with aggression responses. We expect higher dispositional aggression and increased alcohol consumption to be predictive of greater direct and indirect aggression.

Why is this important to study?

Findings from this study will advance our understanding of alcohol-related aggression. If we understand the triggers of aggression after alcohol use, we can manipulate these triggers to decrease aggressive acts.

What if I want to know more?

If you are interested in learning more about different types of aggression and alcohol's effects on aggressive behaviors, you may want to consult:

- (1) Archer, J. (2004). Sex differences in aggression in real-world settings: A meta-analytic review. *Review of General Psychology*, 8(4), 291-322.
- (2) Giancola, P. R., Levinson, C. A., Corman, M. D., Godlaski, A. J., Morris, D. H., Phillips, J. P., & Holt, J. C. D. (2009). Men and women, alcohol and aggression. *Experimental and Clinical Psychopharmacology*. 17(3), 154-164.

All the information we collected in today's study will be confidential. We are not interested in any one individual's responses; we want to look at the general patterns that emerge when the data are aggregated together.

If your participation in this study has caused you concerns, anxiety, or otherwise distressed you, you may want to contact the ODU Counseling Center at (757) 683-4401.

If you have questions about your participation in this study or would like to contact the researcher, please email Brynn Sheehan, M.A., at bshee006@odu.edu

Thank you again for your participation.

VITA

Brynn Elizabeth Sheehan

Old Dominion University
5115 Hampton Boulevard
Norfolk, VA 23529

Education and Training

- Ph.D.** Old Dominion University, Norfolk, VA
Applied Experimental Psychology, 2016 (Expected)
Advisor: Cathy Lau-Barraco, Ph.D.
- M.S.** Old Dominion University, Norfolk, VA
Applied Experimental Psychology, 2014 (Expected)
Advisor: Cathy Lau-Barraco, Ph.D.
- M.A.** University of New Hampshire, Durham, NH
Justice Studies, 2011
Advisor: Ellen S. Cohn, Ph.D.
- B.A.** Bloomsburg University of Pennsylvania, Bloomsburg, PA
Psychology, 2010
Advisor: Julie Kontos, Ph.D.

Background

Brynn E. Sheehan is a third year graduate student at Old Dominion University. She is pursuing her Master's degree in Applied Experimental Psychology and, in Fall 2014, her Ph.D. in Applied Experimental Psychology.

Published Manuscripts

Kelley, M.L., Linden, A.N., Milletich, R.J., Lau-Barraco, C., Kurtz, E.D., D'Lima, G.M., Bodkins, J.A., & Sheehan, B.E. (2014). Self and partner alcohol-related problems among ACOAs and non-ACOAs: Associations with depressive symptoms and motivations for alcohol use. *Addictive Behaviors*, 39(1), 211-8.

Sheehan, B.E., Lau-Barraco, C. & Linden, A. (2013). Risky drinking behaviors, alcohol-related problems, and drinking motives among college students. *Journal of American College Health*, 61(8), 444-452.

Sheehan, B.E., Murphy, S., Moynihan, M., & Dudley, E. (accepted 2012). Covictims of intimate partner homicide: New insights for understanding risks and lethality. *Manuscript accepted for publication in Violence against Women*.