Fall 2019

Associations Between Drinking, Condom Use Resistance, and Condom Use Among College Students

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ASSOCIATIONS BETWEEN DRINKING, CONDOM USE RESISTANCE, AND CONDOM USE AMONG COLLEGE STUDENTS

by

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B.S. December 2016, Northern Kentucky 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
December 2019

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ABSTRACT

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Old Dominion University, 2019
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Alcohol use and sexual intercourse are common behaviors among young adults in college. Drinking is considered a risk factor for unprotected sexual intercourse. Having condomless sex is associated with increased risk of contracting an STI or becoming pregnant unintentionally. Although correct and consistent condom use protects against such consequences, many individuals may resist condom use during sexual intercourse. As such, condom use resistance beliefs may be the factor through which alcohol reduces condom use. Evidence from Theory of Planned Behavior (TPB), Alcohol Expectancy Theory, and a body of evidence supports individual beliefs to be predictive of condom use intentions and behavior. However, limited research has explored the belief-behavior relationship within condom use resistance. Resistance beliefs and sex-specific alcohol expectancies may contribute to risky condom use. Thus, a theoretical model was proposed whereby the relationship between drinking and condom use behavior may be explained by both belief components (i.e., sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy) and intentions to resist condoms. Specifically, the aims of this study were to 1) examine the correlations between all model variables, 2) examine the direct effects in the conceptual model, 3) test each sequential mediation pathway from alcohol consumption to condom use and compare the relative strength of each mediation pathway from alcohol use to condom use, 4) examine potential gender differences in each sequential mediation pathway from alcohol consumption to condom use, and compare the relative strength of each mediation pathway from

alcohol consumption to condom use within each gender. Results supported the application of TPB constructs in the context of condom use resistance and condom use. Sex-related alcohol expectancies, condom use resistance norms, and resistance self-efficacy were not supported as mediators. Additionally, the theoretical model was not found to differ based on gender. These results addressed gaps in the literature and contributed to the understanding of drinking as a risk factor for condom use resistance and thus, decreased condom use. Future research on the relationship between alcohol and condom use may benefit from event-level or ecological momentary assessment to parse apart belief and intoxication effects on condom use.

ACKNOWLEDGEMENTS

I want to thank Dr. Cathy Lau-Barraco for taking a chance on me. The opportunity she gave me and her continued support will resonate with me the rest of my life. Her mentorship, determination, and patience have been an inspiration to me as a researcher and a leader. I am truly fortunate to have had her feedback and dedication through one of the most challenging journeys of my life. I would also like to thank my committee members, Dr. James Paulson and Dr. Alan Meca, for their collaboration and support in my research career.

I would like to thank the most wonderful peer mentor anyone could ask for. Amy Stamates, thank you for answering every question, being a shoulder to cry on, and always reminding me that I will succeed. To my sister Chloe, I couldn't be more grateful that you went through this gauntlet before me. You were always there to listen, give advice, remind me that I'm not crazy, and there is a light at the end of the tunnel. Thank you to my parents, without you I would not be here. The love, understanding, and support you have given me is as bountiful as the sea. With you, I know I can do anything. To you my baby bear Roscoe, you are my anchor and my home. My love for you was a constant motivation to do better and push through, because all the hard work is for more than just me.

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CHAPTER I

INTRODUCTION

Hazardous drinking is common on U.S. college campuses (Hingson, Zha, & Weitzman, 2009; Johnston, O'Malley, Bachman, & Schulenberg, 2013; Wechsler, Lee, Kuo, & Lee, 2000). Recent data suggest that 57.1% of U.S. young adults aged 18 to 25 years were past-month alcohol users, with 38% of this group reporting binge drinking (i.e., 4/5+ drinks for women/men over a two-hour period; (American College Health Association, 2017). Young adults experience some of the most prevalent and problematic alcohol-related consequences (e.g., physical injury/death, interpersonal problems, academic problems; White and Ray, 2014).

One consequence of drinking that is particularly problematic is engaging in risky sexual behaviors, including not using a condom (Rehm, Shield, Joharchi, & Shuper, 2012). Use of condoms reduces HIV and other sexually transmitted infection (STI) transmission, and unwanted pregnancies (Crosby & Bounse, 2012; Trussell, 2011). These consequences are highly prevalent in the young adult population. Among those between 20 to 29 years old, rates of HIV infection diagnoses remain stable around 30 to 35 diagnoses per 100,000 from 2011-2016 (CDC, 2016). Also, STIs are prevalent among those aged 15 to 24 years, with this age group acquiring half of all new STIs (CDC, 2017). Despite these health risks, up to 48.5% of sexually active young adults have reported resisting condom use at least once since becoming sexually active (e.g., DeBro, Campbell, and Peplau, 1994; Oncale & King, 2001; Wegner, Lewis, Davis, Neilson, & Norris, 2017).

The inconsistent use of condoms during sexual intercourse is a problem in the college student population (American College Health Association, 2017). One factor contributing to inconsistent condom use is alcohol consumption (Rehm et al., 2012, Scott-Sheldon, Carey,

Cunningham, Johnson and Carey, 2016). There is not a clear understanding of exactly how alcohol use is associated with reduced condom use. Consequently, the present study proposes to further our understanding of why individuals who consume alcohol may be less likely to use condoms. Specifically, guided by Theory of Planned Behavior (TPB) and Alcohol Expectancy Theory, a conceptual model is proposed whereby the relationship between drinking and condom use behavior may be explained by both belief components (i.e., sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy) and intentions to resist condom use. Given that condom use behavior (Reece et al., 2010) and drinking (Holmila & Raitasalo, 2005) may differ between the genders, the present research also aims to assess which belief component is strongest in accounting for the relationship between drinking and condom use for each gender.

Alcohol Use and Related Consequences among Young Adults

Heavy drinking is often a normative part of the college experience, with 37% to 44% of college students reporting binge drinking during the last two weeks (Johnston, et al., 2013; Wechsler & Nelson, 2008). This level of heavy drinking places college students at heightened risk for alcohol-related negative consequences, including interpersonal and academic problems (Park, 2004), bodily damage or injury (Chase, Neild, Sadler, & Batey, 2005; Hingson et al., 2009), neurocognitive damage (Lee, Roh, & Kim, 2009; Marino & Fromme, 2018; Zeigler et al., 2005), or death (Hingson et al., 2009). Additionally, there are sex-related consequences. Approximately 100,000 college students aged 18 to 24 in the United States experience a sexual assault or date rape from a drinking college student (Hingson et al., 2009). Other sex-related consequences associated with heavy alcohol use include increased likelihood of not using a

condom, having casual sex partners, and having increased total sex partners (Caldeira et al., 2009; Cooper, 2002; Hingson, Heeren, Winter, & Wechsler, 2005).

Risky Sexual Behavior among Young Adults

Risky sexual behavior is defined as behavior that increases the probability of experiencing negative consequences commonly associated with sexual contact. These include contracting STIs or HIV/AIDS (Ritchwood, Ford, DeCoster, Sutton, & Lochman, 2015), having multiple or risky partners (Cooper, 2002), failing to discuss risk topics prior to sexual intercourse (Desiderato & Crawford, 1995), and failing to take protective actions (e.g., use birth control; Levene, 2001). Correct and consistent use of the male condom prevents STIs and pregnancy (Crosby & Bounse, 2012; Trussell, 2011). Thus, the failure to use a condom during sexual intercourse is an important risky sexual behavior.

Risky condom use behavior is a concerning issue with young adult populations. In the past 12 months, 61% of college students reported having oral, vaginal, or anal sex with one or more partners (American College Health Association, 2017). Regarding the last time they had vaginal intercourse, 30% of males and 40% of females reported not using a male condom (American College Health Association, 2017). Thus, a considerable portion of sexually active college students are not using safe sexual health practices and are engaging in risky sexual behavior. As a result, a considerable portion of college students have reported an experience with STIs (Satterwhite et al., 2013), unintentional pregnancies (Finer & Zolna, 2016), and numerous other consequences that may follow infection or pregnancy (Bensyl, Iuliano, Carter, Santelli, & Gilbert, 2005; Bryant, 2009; Mindel & Marks, 2009; Mosher, Martinez, Chandra, Abma, & Wilson, 2004; World Health Organization, 2016).

Previous condom use research has approached the study of condom use with the perspective that individuals fail to use a condom or not. Individuals may report failing to put one on or not having a condom available as the reason for their non-use (Rosengard, Anderson, & Stein, 2006). However, this passive perspective fails to capture the complete picture of young adult condom use behavior. Forty-three percent of young adult males reported putting a condom on after starting sexual intercourse (Crosby, Sanders, Yarber, Graham, & Dodge, 2002). Also, 15% reported removing the condom before finishing sex (Crosby et al., 2002). These findings suggest young adults are not just "failing" to use a condom, but instead, some are resisting the use of condoms actively. As such, condom use resistance is a unique perspective that may further our understanding of condom use behaviors among young adults.

Operationally defined, condom use resistance is when an individual avoids using a condom during sexual intercourse with a partner who may desire to use one (Davis et al., 2014c). To resist condom use, one may lie to their partner that they do not have a condom, attempt to arouse their partner to the point they no longer want to use a condom, or assure their partner that their risk level is low. Up to 48.5% of sexually active young adults have reported resisting condom use at least once since becoming sexually active (DeBro, Campbell, and Peplau, 1994; Oncale & King, 2001; Wegner, Lewis, Davis, Neilson, & Norris, 2017). Thus, condom resistance may be a contributing factor to young adult condom non-use.

The use of alcohol also plays an influential role in the decision to use condoms (for review see Scott-Sheldon, Carey, Cunningham, Johnson, & Carey, 2016). For example, Davis and colleagues (2014b) conducted a qualitative study among young adult men who drink to examine perceived advantages and disadvantages of condom use. Participants reported that alcohol decreases the likelihood of them using condoms. Experimental research also supports

these findings. In particular, condom use resistance was significantly higher among participants who were administered a dose of alcohol as compared to those who did not receive alcohol (Davis et al., 2016). Like men, women have reported drinking and condom use resistance behavior (Wegner et al., 2017). Thus, evidence supports the positive relationship between alcohol use and condom use resistance. As such, condom use resistance may be the factor through which alcohol reduces condom use.

Conclusions. Condom use resistance is a high-risk sexual behavior. Alcohol consumption appears to be an influential factor on condom use behaviors among young adults. Recent evidence suggests this negative relationship between alcohol use and condom use may be better understood through the perspective of condom use resistance. Research examining condom use resistance is needed to gain a better understanding of the association between drinking and risky condom use behavior.

Proposed Mediators of Alcohol-Related Sexual Behavior

Overview. Research supports a positive link between alcohol use and risky sexual behavior; however, it remains unclear which underlying mechanisms may explain this association. Guided by the Theory of Planned Behavior (TPB) and Expectancy theory, belief factors (e.g., condom use resistance norms, condom use resistance self-efficacy, and sex-related alcohol expectancies) may account for the connection between alcohol use and condom use.

Theory of planned behavior. The TPB has been applied to study a range of behaviors including smoking, eating and exercise behavior (review: Godin & Kok, 1996; Hagger, Chatzisarantis, & Biddle, 2002; Riebl et al., 2015). The general premise of the theory is that individuals make decisions to engage in certain behaviors by evaluating aspects related to the specific behavior. Specifically, TPB asserts behavior is guided by a framework of individually

held beliefs (Ajzen, 2005) which factor into intention, the proximal determinant of behavior. Specifically, the belief system includes behavioral beliefs, normative beliefs, and control beliefs (Ajzen, 1991). These different beliefs amount to what or how an individual intends to behave. Thus, behavioral intention is the factor through which beliefs turn into behavior. In sum, the TPB explains how an individual's attitudes, perceived norms, and perceived self-efficacy determine how they intend to behave.

Behavioral intention. Intentions are defined as self-instructions about performing a given behavior (Ajzen, 1991). They have been posited within the TPB to be determined by a system of individually held beliefs (Ajzen, 2005). Intention represents a personal factor (i.e., attitude toward the behavior), social influence (i.e., subjective norms), and perceived behavioral control (i.e., self-efficacy; Ajzen, 2005). These various beliefs provide the individual direction on what to do in a given situation in correspondence with what is believed (Fazio, 1986). Based on the type and degree of the behavioral belief, different intentions with varying levels of motivation should result. As such, an individual's behavioral intention represents and reflects their beliefs regarding a given behavior.

Intentions are portrayed as the key factor of the model from TPB. Intentions act as the transitional factor by guiding the indirect effect of beliefs on behavior. Each belief is a processing mechanism through which information or stimulus from the environment go through (Fazio, 1986). Depending on the type of belief (i.e., attitude, norm, or control) and degree (e.g., positive or negative) of the belief, individual's intention formation and corresponding behavioral response to the stimulus will vary. As such, intentions mediate the relationship between beliefs and behavior.

Research investigating the association between drinking and risky sex has provided strong evidence for the potential mediational role of intentions. Specifically, Scott-Sheldon and colleagues (2016) conducted a meta-analytic review of all studies utilizing an experimental design of alcohol's effects on aspects of sexual decision-making (e.g., communicating about sex and/or condoms and self-reported likelihood of unprotected sex) when exposed to a sexual stimulus. Findings indicated that alcohol consumption affects intentions to engage in unprotected sex. These participants who actually drank alcohol reported stronger intentions to have unprotected sex compared to either placebo or no alcohol control groups. With such intentions being associated with increased sexual risk behavior (Sheeran, Abraham & Orbell, 1999), this finding emphasizes the important mediational role of intentions between drinking and risky condom behavior.

Norms. Norms are a determinant of behavioral intention. Norms may be injunctive or descriptive. Injunctive norms are a person's beliefs about how other individuals or groups feel about a particular behavior (Ajzen, 2005). Descriptive norms are a person's beliefs about what the typical behavior of others is. This perception of how others think they should or should not perform a behavior contributes to their own beliefs (Rimal & Real, 2003). Important social referents to these beliefs may include friends, family or peers. Depending on whether the referent approves or disapproves of the behavior in question, the individual will feel social pressure to behave accordingly (Lapinski & Rimal, 2005). These normative beliefs correspond with the person's intentions and, thus, the corresponding behavior (Ajzen, 1991; Ajzen 2005).

Research assessing alcohol-related sex peer norms has tested both injunctive norms and descriptive norms. Perceiving that peers view risky sexual behaviors (e.g., not using condoms) as normal and acceptable increases the likelihood the individual will behave in line with that

normative belief (Sheeran et al., 1999). Additionally, the perception that same-sex peers engage in sexual behavior after or while drinking is positively associated with one's own alcohol-related sexual behavior (Lewis, Lee, Patrick, & Fossos, 2007). In general, college students typically underestimate protective sexual health behavior (e.g., condom use) and overestimate frequency of risky sexual behavior among their peers (e.g., typical number of drinks consumed prior to sex; Lewis, Litt, Cronce, Blayney, & Gilmore, 2014). As a result, the normative misperceptions, regardless of accuracy, may influence intoxicated condom use behavior or condom use resistance intentions.

Only one randomized alcohol administration experimental study has examined condom use resistance norms and their relationship with condom use resistance intentions (Davis et al., 2016). They found that condom use resistance norms were not a significant predictor of condom use resistance intentions while sober or under the influence in the laboratory. However, among men, their perception that important people in their life think they should resist condom use and support their condom use resistance increases in the alcohol compared to sober condition. Specifically, after acute alcohol intoxication, individuals believed their peers to be more accepting about not using condoms. Thus, the desire to resist using a condom increases after drinking. Together, current literature suggests that condom use norms are associated with condom use resistance intentions and condom use behavior.

Self-efficacy. Self-efficacy, or perceived behavioral control, is another determinant of behavioral intention. Self-efficacy is defined as how an individual perceives their own capability of performing a given behavior (Ajzen, 1991). These beliefs come from the individual's previous experience with the behavior and through observation of experiences of peers (Bandura, 1977). Increases in perceived self-efficacy proportionally increases the intention to perform a

given behavior as well as the performance itself (Ajzen, 2005). In brief, self-efficacy affects behavior directly and indirectly through its mediational relationship with behavioral intentions.

Evidence has consistently supported condom use self-efficacy as a significant positive predictor of condom use intention and behavior. Condom use self-efficacy refers to an individual's perceived ability to organize and execute behaviors required to successfully use condoms (Baele, Dusseldorp, & Maes, 2001). Condom use self-efficacy is consistently a significant predictor of both intended and actual condom use (Baele et al., 2001; Bandura, 1990; Lescano, Brown, Miller, & Puster, 2007). Another study found that as condom use self-efficacy or related negotiation skills increased, actual condom use also increased (Carvalho, Alvarez, Barz, & Schwarzer, 2015). Further examinations found that even during intoxicated sexual situations, lower condom use self-efficacy was still found to be associated with less actual condom use behavior (Abbey et al., 2007; Barta, Tennen, & Kiene, 2010). These findings emphasize the important and influential role of condom use self-efficacy on intended and actual condom use behavior.

Related to the concept of condom use self-efficacy is the notion of condom use *resistance* self-efficacy. This latter concept refers to the individual's perceived ability to coordinate and perform behavior required to resist the use of condoms during sexual intercourse (Davis et al., 2016). Only one prior study has examined the role of condom use resistance self-efficacy in the link between alcohol and risky condom use. Davis et al. (2016) conducted an experimental alcohol administration study to examine condom use resistance self-efficacy in relation to condom use resistance intentions among sober and intoxicated participants. They found condom use resistance self-efficacy was significantly associated with condom use resistance intentions for both sober and acutely intoxicated individuals. This finding corroborates previous cross-

sectional and daily diary findings (Abbey et al., 2007; Barta et al., 2010). In addition, Davis et al. (2016) found that mean levels of condom use resistance self-efficacy increased under intoxication. Although condom use resistance self-efficacy was associated with intention among the sober and intoxicated, it may be more problematic that the intoxicated individuals reported a stronger perceived capability to not use condoms. Thus, alcohol consumption may contribute to one's perceived capability to resist condom use. Given these findings, the inclusion of this construct in the proposed conceptual model is warranted and may provide vital information regarding how alcohol use is a risk factor to condom use.

In sum, the TPB guides the structure of the proposed conceptual model and the selection of several proposed mediators (e.g., norms, self-efficacy, and behavioral intention). TPB provides a theoretically and empirically supported model of how beliefs function to inform and guide behavior. However, missing from TPB is the belief about expectations of performing a given behavior. Prior research on sexual risk has supported the influential role of sex-specific alcohol expectancies (i.e., sex-related alcohol expectancies) on the performance of corresponding intoxicated risky sexual behavior. Thus, a conceptual model explaining alcohol-related risky condom use behavior should consider sex-related alcohol expectancies in order to explain the link between alcohol use and condom use.

Alcohol expectancy theory. Alcohol expectancy theory suggests that drinking behaviors are influenced by expectations or beliefs about the expected outcomes of consuming alcohol (Goldman, 1994). An expectancy reflects beliefs about the effects of alcohol on one's behavior and affect (Leigh, 1990). This expectation is a learned relationship between a stimulus (e.g., alcohol), a response (e.g., intoxication), and the outcome of the response (e.g., disinhibition). When activated, alcohol expectancies can directly and indirectly influence drinking behavior

(Goldman, Del Boca & Darkes, 1999). Indeed, it has been shown that alcohol expectancies are related to current and future drinking behavior as well as an increased likelihood of experiencing alcohol-related problems (Jones, Corbin, & Fromme, 2001; Pabst, Kraus, Piontek, Mueller, & Demmel, 2014; Palfai & Wood, 2001; Patrick, Wray-Lake, Finlay, & Maggs, 2010).

Sex-related alcohol expectancies (i.e., expected sexual effects of drinking) are a specific type of behavioral belief that has garnered support in explaining the link between drinking and risky sexual behavior. Dermen and Cooper (1994a) found that compared with general alcohol expectancies, sex-specific expectancies (i.e., enhancement, disinhibition, and sexual risk-taking) were consistently superior predictors of drinking in sexual contexts. Additionally, individuals with stronger sex-related alcohol expectancies were more likely to drink in sexual situations and were more likely to drink in larger amounts (Leigh, 1990). Thus, individuals who believe in alcohol's sexual effects were more likely to drink before a sexual experience (George & Stoner, 2000).

Previous research has shown that individuals with strong sex-related alcohol expectancies also engage in risky condom use behavior (Bryan, Ray & Cooper, 2007; LaBrie, Earleywine, Schiffman, Pedersen & Marriot, 2005). Sexual risk-taking alcohol expectancies have a positive relationship with likelihood of condomless sex (Bryan et al., 2007; LaBrie et al., 2005). Heterosexual women (Brown, Talley, Littlefield, & Gause, 2016) and men (Currin, Croff, Hubach & Miller, 2017) with strong expectations that alcohol use will result in risky sexual behavior are more likely to have unprotected sexual intercourse after drinking. These findings support sex-related alcohol expectancies as a potential contributing factor in the negative relationship between alcohol and condom use.

Despite research supporting the link between sex-related alcohol expectancies and risky condom use behavior, there is a gap in the literature examining the link between expectancies with condom use resistance. Condom use resistance, compared to the passive non-use of condoms, is the active resistance of condom use during sex. Individuals are not just failing to remember a condom or put one on. They are purposefully trying to not use a condom (Davis et al., 2016). As such, condom use resistance is a potentially problematic specific risky sexual behavior. Guided by the broader literature on sex-related alcohol expectancies and risky condom use (Brown et al., 2016; Bryan et al., 2007; Currin et al., 2017; LaBrie et al., 2005), these expectancies may be related to condom use resistance. The current study sought to address this gap in the literature and explored if sex-related alcohol expectancies are related to condom use resistance.

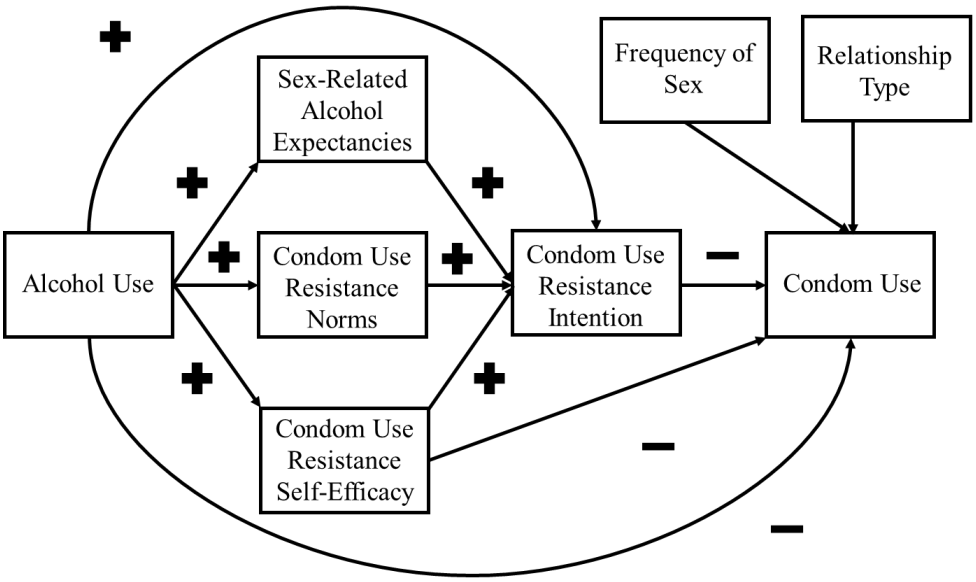

Figure 1. A conceptual model of Theory of Planned Behavior and Alcohol Expectancy Theory in which the indirect relationship between alcohol consumption and condom use is serially mediated by belief facets (i.e., sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy) and condom use resistance intentions.

The Current Study

The overall aim of this study was to contribute to the theoretical understanding of alcohol-related risky sexual behavior. The current study proposed a conceptual model to test multiple facets of an individual's belief system and their intention as mediators of the alcohol use-condom use link (see Figure 1). Specifically, sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy were tested as underlying mechanisms explaining associations between alcohol use and condom use. Condom use resistance intentions were considered as a mediating factor between beliefs and condom use. Thus, these proposed constructs were modeled to test the association that alcohol use is related to condom use through its association with beliefs (i.e., expectancies, norms, self-efficacy) and intentions. Further, the current study proposed to examine the relative influence of each proposed mediation pathway from alcohol consumption to condom use. Finally, within each gender, the relative influence of each mediation pathway from alcohol consumption to condom use was examined.

In sum, the proposed research ultimately sought to explore a more comprehensive model for investigating the relationship between drinking and condom use among college students. Findings could contribute to the development of comprehensive interventions aimed at reducing alcohol-related risky sexual behavior and the consequences that follow.

Specific aims and hypotheses were as follows:

Aim 1: To examine the bivariate correlations between all model variables: alcohol use, sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy, condom use resistance intentions, and condom use. Findings could corroborate previous findings regarding the association between TPB condom use resistance constructs given prior research suggesting both condom use resistance norms and condom use resistance self-

efficacy are associated with condom use resistance intentions (Davis et al., 2016). Also, the association between condom use resistance intentions and condom use has yet to be examined. Demonstrating this association would add to literature by corroborating the theoretical link between intention and behavior. Finally, prior research has not tested the association between sex-related alcohol expectancies and condom use resistance intentions. Doing so would reveal how sex-specific alcohol expectancies may relate to intentions to resist condoms during sexual intercourse.

Hypothesis 1: Based on previous research (Leigh, 1990; Davis et al., 2016), it was expected that alcohol use will have a positive correlation with each of the three proposed belief facets (i.e., sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy; see Figure 1). That is, greater alcohol use would be linked with greater sex-related alcohol expectancies, greater condom use resistance norms (i.e., greater perceived peer acceptance of condom use resistance), and greater condom use resistance self-efficacy (i.e., increased feeling of self-efficacy to resist condom use). Also, it was expected that alcohol use would have a negative correlation with condom use behaviors (Scott-Sheldon et al., 2016). Regarding the belief facets, it was expected that sex-related alcohol expectancies (Dermen & Cooper, 1994a), condom use resistance norms (Davis et al., 2016), and condom use resistance self-efficacy (Davis et al., 2016) would have positive correlations with condom use resistance intentions. Further, condom use resistance self-efficacy would have a negative correlation with condom use (Ajzen, 1991). Finally, condom use resistance intentions would have a negative relationship with condom use rates (Davis et al., 2016; Wegner et al., 2017).

Aim 2: To examine the direct effects in the proposed conceptual model.

Aim 2a: To examine the direct effect of alcohol use on condom use.

Hypothesis 2a: A body of literature suggests alcohol has a negative effect on condom use (Scott-Sheldon et al., 2016). Thus, it was expected that alcohol use would have a direct effect on condom use. Specifically, it was hypothesized that alcohol use would have a direct negative effect on condom use.

Aim 2b: To examine the direct effect of alcohol use on condom use resistance intentions.

Hypothesis 2b: Research suggests alcohol consumption has a positive effect on condom use resistance intentions (Davis et al., 2016). Thus, it was hypothesized that alcohol use would have a direct effect on condom use resistance intentions. Specifically, it was expected that alcohol use would have a direct positive effect on condom use resistance intentions.

Aim 2c: To examine the direct effect of condom use resistance self-efficacy on condom use.

Hypothesis 2c: Theory posits that self-efficacy is both indirectly and directly related to the corresponding behavior (Bandura, 1977; Ajzen, 2005). Evidence supports the direct effect of condom use self-efficacy on condom use (Baele et al., 2001; Bandura, 1990; Lescano et al., 2007). Given this, it was expected that condom use resistance self-efficacy would have a direct effect on condom use. Specifically, it was hypothesized that condom use resistance self-efficacy would have a negative effect on condom use.

Aim 3: To test a sequential mediation pathway from alcohol consumption to condom use and to compare the relative strength of each sequential mediation pathway from alcohol consumption to condom use. Specifically, three indirect paths were examined separately.

Aim 3a: To examine the indirect relationship between drinking and condom use through its association with *sex-related alcohol expectancies* and condom use resistance intentions (see Figure 2).

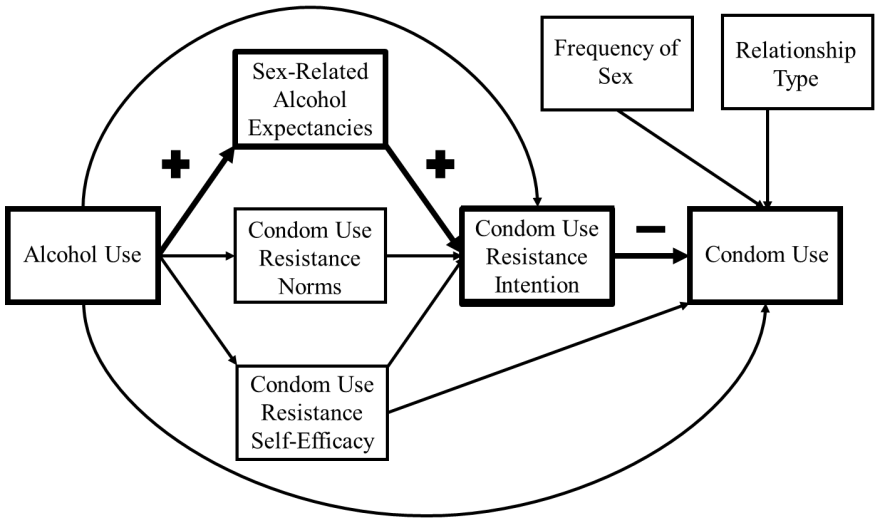

Figure 2. A serial mediation pathway in which the indirect relationship between alcohol use and condom use is mediated by *sex-related alcohol expectancies* and condom use resistance intentions.

Hypothesis 3a: Alcohol expectancies contribute to initiation and maintenance of drinking behavior (for review see Jones et al., 2001). Increased drinking is consistently associated with stronger positive alcohol expectancies (Jones et al., 2001). Following the body of literature on drinking and alcohol expectancies, research has found that increased alcohol use is similarly associated with increased *sex-related alcohol expectancies* (Leigh, 1990). Additionally, both drinking (Scott-Sheldon et al., 2016) and sex-related alcohol expectancies (Brown et al., 2016) are associated with an increased likelihood of not using a condom (Currin et al., 2017). Research has yet to examine the link between sex-related alcohol expectancies and condom use resistance intentions. However, individuals who hold positive or strong sex-related alcohol expectancies believe alcohol use will result in risky sexual behavior (Dermen & Cooper, 1994a, 1994b). Condom use resistance is a specific risky sexual behavior. As such, individuals who hold strong sex-related alcohol expectancies may have greater intentions to resist condom use (Davis et al., 2014a; Wegner et al., 2017). Thus, it was hypothesized that there would be an

indirect, sequential path from alcohol use to condom use through both sex-related alcohol expectancies and condom use resistance intentions, such that increased alcohol use would be associated with more sex-related alcohol expectancies, which in turn would be associated with more condom use resistance intentions and then decreased condom use during intoxicated sexual encounters. It was expected that these relationships would be found after controlling for the effects of frequency of sexual intercourse (for review see Sheeran et al., 1999). Frequency of sexual intercourse has found to be negatively associated with condom use across 12 studies (Sheeran et al., 1999). Thus, it was important to control for the effect of individual differences in experience with sexual intercourse on condom use. Also, it was expected that these links would be found after controlling for the effects of partner type (Brown & Vanable, 2007; LaBrie et al., 2005). It has been found that patterns of condom use are associated with sexual partner type (Brown & Vanable, 2007; LaBrie et al., 2005). Individuals in steady relationships are more likely to have established condom use patterns. By accounting for these individual differences in partner type on condom use, the potential effect of this factor was statistically controlled.

Aim 3b: To examine the indirect relationship between drinking and condom use through its association with *condom use resistance norms* and condom use resistance intentions (see Figure 3).

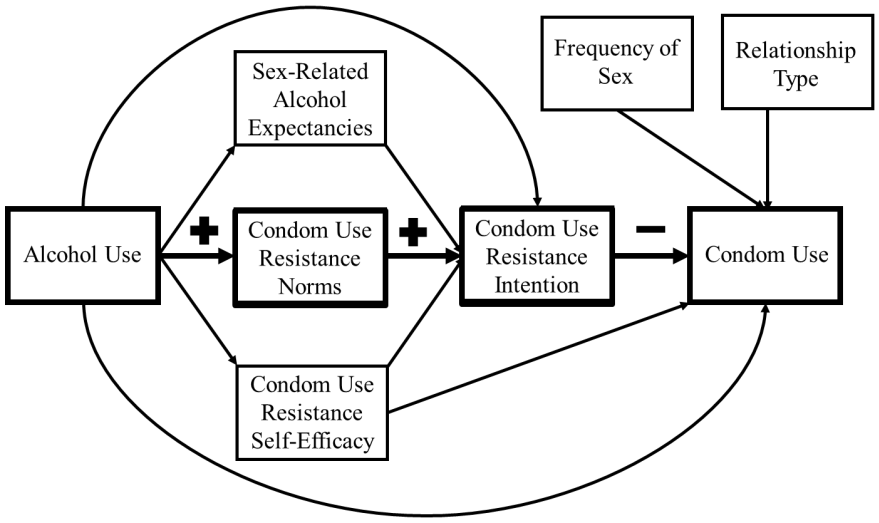

Figure 3. A serial mediation pathway in which the indirect relationship between alcohol use and condom use is mediated by condom use resistance norms and condom use resistance intentions.

Hypothesis 3b: Findings from Davis et al. (2016) suggest that increased alcohol consumption may be related to increased normative beliefs regarding the resistance of condom use when intoxicated. Further, a large body of literature on general condom use supports norms to be associated with condom use intentions and condom use (for meta-analyses see Albarracin, Johnson, Fishbein, & Muellerleile, 2001; Sheeran et al., 1999). Thus, it was hypothesized that there would be an indirect, sequential path from alcohol use to condom use through both condom use resistance norms and condom use resistance intentions. Specifically, alcohol use would be associated with less condom use through an increase in condom use resistance norms and an increase in condom use resistance intentions. These relationships were expected to be found even after controlling for the effects of frequency of sexual intercourse (Sheeran et al., 1999). As previously noted, greater frequency of sexual intercourse is associated with less condom use (Sheeran et al., 1999). By controlling this variable, the effect of individual differences was removed. As noted in aim 3a, it was expected that these links would be found after accounting for the effects of partner type (Brown & Vanable, 2007; LaBrie et al., 2005). Patterns of condom

use are associated with sexual partner type (Brown & Vanable, 2007; LaBrie et al., 2005). By controlling for these differences in partner type on condom use, the potential effect of this factor was accounted for.

Aim 3c: To examine the indirect relationship between drinking and condom use through their association with *condom use resistance self-efficacy* and condom use resistance intentions (see Figure 4).

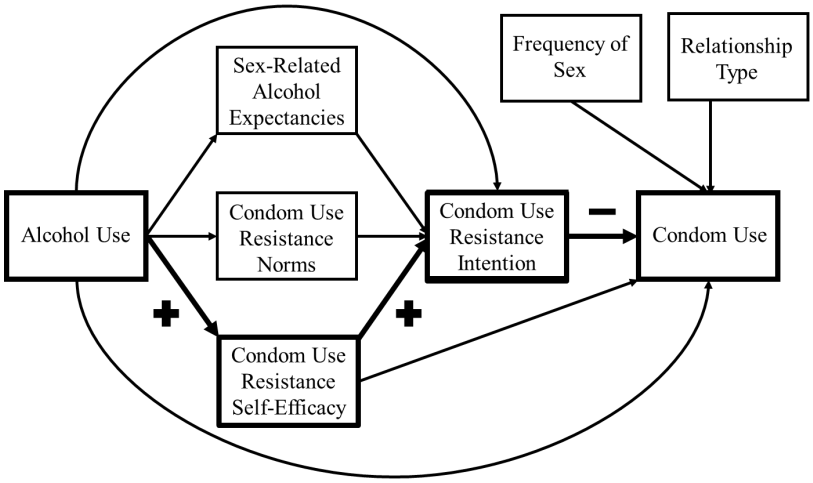

Figure 4. A serial mediation pathway in which the indirect relationship between alcohol use and condom use is mediated by condom use resistance self-efficacy and condom use resistance intentions.

` *Hypothesis 3c:* Self-efficacy (i.e., perceived behavioral control) has been found to be a strong predictor of intended and actual condom use (Baele et al., 2001). Previous research supports that intoxication may increase condom use resistance self-efficacy, and in turn, increase condom use resistance intentions (Davis et al., 2016). However, self-efficacy and intentions have yet to be examined in relation to behavioral outcomes (i.e., condom resistance resulting in not using a condom). Based on research on general condom use self-efficacy and condom use intentions (Baele et al., 2001; Bandura, 1990; Lescano et al., 2007), it was expected that self-efficacy would have a positive association with corresponding intentions. Thus, it was

hypothesized that there would be an indirect, sequential path from alcohol use to condom use through both condom use resistance self-efficacy and condom use resistance intentions. Specifically, increased alcohol use would be associated with more condom use resistance self-efficacy, which in turn, would be associated with increased condom use resistance intentions and then decreased condom use. It was expected that these links would be found after controlling for the effects of frequency of sexual intercourse (Sheeran et al., 1999). It has been established that frequency of sexual behavior is associated with condom use (Sheeran et al., 1999). By accounting for individual differences in frequency of sexual behavior on condom use, the potential effect of this factor was removed. Consistent with aim 3a and 3b, partner type was controlled by including it as a covariate. This statistically controlled for the potential effect of these individual differences in partner type on condom use.

Aim 3d: To compare the relative strength of each sequential mediation pathway from alcohol consumption to condom use. Specifically, three paths will be examined simultaneously.

Hypothesis 3d: Although no study has compared the mediation effects of the present study's specific mediators (i.e., sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy), prior work suggests that self-efficacy may explain the most variance in condom use intentions (meta-analysis: Sheeran & Taylor, 1999) and behavior (meta-analysis: Albarracin et al., 2001; Carvalho et al., 2015). Thus, it was hypothesized that the specific mediation effect of condom use resistance self-efficacy would be the strongest when compared to sex-related alcohol expectancies and condom use resistance norms.

Aim 4: To examine potential gender differences in each sequential mediation pathway from alcohol consumption to condom use and compare the relative strength of each sequential mediation pathway from alcohol consumption to condom use within each gender.

Hypothesis 4a: Previous research suggests that sex-specific alcohol expectancies may be associated with condom use differently for men and not women. While sex-related alcohol expectancies have been shown to be associated with condom use behavior among men and women (Bryan et al., 2007; LaBrie et al., 2005), findings have been less consistent with women (Currin et al., 2017; LaBrie et al., 2002). This may be because other factors (e.g., birth control) may impact condom use more than alcohol use among women as compared to men (LaBrie et al., 2002). Thus, it was hypothesized that sex-specific alcohol expectancies would be a significant mediator of alcohol use and condom use among men but not among women.

Hypothesis 4b: Previous research suggests that condom use norms are similarly associated with condom use between males and females (Lewis et al., 2007; Lewis et al., 2014). Thus, it was expected that condom use resistance norms would significantly mediate alcohol use and condom use resistance intentions for both men and women.

Hypothesis 4c: Condom use self-efficacy has shown to be related to condom use behavior among both men and women (Abbey et al., 2007; Baele et al., 2001; Barta et al., 2010; Lescano et al., 2007). Thus, it was expected that condom use resistance self-efficacy would mediate the association between alcohol use and condom use resistance intentions for both males and females.

Hypothesis 4d: Previous research suggests that alcohol expectancies may contribute to condom use to a greater degree than norms or self-efficacy among *men*. Among men, alcohol use and sex-related alcohol expectancies have been found to decrease motivation

for condom use (Gordon et al., 1997). Additionally, sex-related alcohol expectancies are associated with condomless sex (Bryan et al., 2007) among men but not among women (Currin et al., 2017). As such, the potential role of sex-related alcohol expectancies in the relationship between alcohol use and condom use may be stronger than condom use resistance norms or condom use resistance self-efficacy among *men*. It was hypothesized that the relative strength of the sex-related alcohol expectancies mediation path would be the strongest compared to condom use resistance norms and condom use resistance self-efficacy for *men.*

Hypothesis 4e: As women do not physically wear male condoms, their perceived control to either use or resist condom use with their partner may play a dominant role in their condom use. The perceived ability to negotiate and enact condom use has been found to be a significant predictor of condom use outcomes among college-educated women (Nesoff et al., 2016). While other belief factors (i.e., expectancies and norms) have been found to predict condom use intention and behavior (review: Albarracin et al., 2001), it was hypothesized that condom use resistance self-efficacy would be the strongest compared to sex-related alcohol expectancies and condom use resistance norms in accounting for condom use for *women.*

CHAPTER II

METHOD

Participants and Recruitment

Participants for the current study were undergraduate students at Old Dominion University (ODU) enrolled in psychology courses. To be eligible, they must have been between the ages of 18 and 25. The rationale for focusing on emerging adults is that this developmental stage is associated with the highest rates of heavy drinking (Substance Abuse and Mental Health Services Administration, 2014) and risky sexual behavior (e.g., STIs or HIV; CDC, 2016; CDC, 2017). Additionally, participants needed to be of heterosexual orientation given that the current study measures the use of male condoms. Thus, only data was collected on individuals whose sexual relations involve penile penetration. Also, participants could not have been engaged or married. These individuals have shown to use condoms differently than single or dating individuals (Brown & Vanable, 2007; LaBrie et al., 2005). Participants needed to have reported consuming at least one alcoholic beverage within the past 12 months. This requirement was to obtain a sample which consumes alcohol but also reflect drinkers with a range of alcohol use behaviors. To obtain a sample that is sexually active, participants needed to have reported engaging in penetrative sex (i.e., vaginal or anal) in the past 12 months.

In total, 345 ODU students started to complete the study survey. Among those initial participants who responded to the survey, 23 responses were removed due to incomplete responses on more than two variables. Additionally, 11 participants were removed for age ineligibility, five were removed for sexual orientation restrictions, three for being engaged, seven for being married, and 22 participants were removed because they did not have sexual intercourse in the past year. The final sample consisted of 274 participants with most being

female (*N* = 222, 81.0%). The average age was 19.91 (*SD* = 1.56) years. Regarding student status, 42.7% were freshman, 21.5% were sophomores, 18.6% were juniors, and 17.2% were seniors. Sample ethnicity was 47.1% Black/African-American, 36.9% White/Caucasian, 4.7% Asian, 5.5% Hispanic, 0.7% American Indian, 0.4% Pacific Islander, 4.0% Biracial and 0.7% missing. Further demographic statistics for the entire sample and separated by gender are reported in Table 1.

Table 1

Descriptive Statistics on Demographic Variables

Variable	Men *n* = 52 *n* (%)	Women *n* = 222 *n* (%)	Total *n* = 274 *n* (%)
Race			
White/Caucasian	15 (28.8)	86 (38.7)	101 (36.9)
Black/African American	27 (51.9)	102 (45.9)	129 (47.1)
Asian	3 (5.8)	10 (4.5)	13 (4.7)
Hispanic	5 (9.6)	10 (4.5)	15 (5.5)
American Indian	0	2 (0.9)	2 (0.7)
Pacific Islander	0	1 (0.5)	1 (0.4)
Biracial	2 (3.8)	9 (4.1)	11 (4.0)
Class			
Freshman	24 (46.2)	93 (41.9)	117 (42.7)
Sophomore	12 (23.1)	47 (21.2)	59 (21.5)
Junior	11 (21.2)	40 (18.0)	51 (18.6)
Senior	5 (9.6)	41 (18.5)	46 (16.8)
N/A		1 (0.5)	1 (0.4)

Procedure

Data collection was administered online through the Sona systems. Participants had the option of participating in the study onsite (ODU main campus) or remotely. For participants choosing to complete the study questionnaire remotely via an online survey, they received 0.5 SONA credits for participation. For participants choosing the on-site option, they were awarded 1.0 SONA credits. The additional 0.5 SONA credits was for their travel time per Psychology Department Policy. The survey took approximately 30 minutes to complete. Study participation was anonymous. Participants were given informed consent. The study was determined to be exempt by the Old Dominion University College of Sciences Human Subjects Review Board prior to data collection and followed APA guidelines (APA, 2017).

Measures

Demographics (see Appendix A)**.** Participants reported their general background information including age, gender, ethnicity, class standing, Greek status, sexual orientation, current and recent (i.e., past three months) relationship status, and recent (i.e., past three months) sexual partner type.

Alcohol use. Participants' typical alcohol use was assessed using the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985; see Appendix B). Participants were asked to report the number of standard drinks they consume on a typical day of the week averaged across the previous three months. This measure captured quantity (total number of drinks in a typical week) as an index of typical alcohol use. The DDQ has high internal consistency (α = .88) as well as adequate test-retest reliability (r = .72) (Collins, Parks, & Marlatt, 1985). Alpha coefficient for the present sample was α = .86. Marlatt et al. (1998) expanded on the psychometric assessment of this measure finding the self-report drinking quantity measure to have adequate

convergent validity with reports of participants' alcohol use over a one-year study (r = .72). Further assessment of test-retest reliability and validity of the DDQ supports its continued use (Miller et al., 2002). Quantity measures showed adequate Pearson correlations of the multiple measurements (r < .85), and quantity measures of the DDQ were validated against the AUDIT quantity measure. Additionally, they compared pencil-paper method to Web-based and found no significant differences.

Sex-related alcohol expectancies. The Sex Specific Alcohol Expectancy Scale (SSAES; Dermen & Cooper, 1994a; see Appendix C) measure is a 13-item questionnaire used to assess endorsement of sex-related alcohol expectancies. Individuals rated each item on a scale from 1 *(Strongly Disagree)* to 6 *(Strongly Agree)*. An example item is "After a few drinks of alcohol, I am less likely (to ask a partner) to use a condom." The measure has three expectancy subscales: sexual risk-taking, sexual enhancement, and disinhibition. Subscales scores were summed with higher scores indicating a stronger endorsement of sex-related alcohol expectancies. The Sex-Related Alcohol Expectancy Scale has demonstrated good internal reliability with a Cronbach's α = .80 or higher (Dermen & Cooper, 1994b). Alpha coefficient for the present sample was α = .89.

Condom use resistance, self-efficacy, condom use resistance intentions. Condom use resistance norms, condom use resistance self-efficacy, and condom use resistance intention were measured using a revised version of the Condom Avoidance Measure (Davis et al., 2016; see Appendix D). The measure specifically asked questions in reference to casual sex partners, but the present study was interested in general condom use resistance with any sexual partner. Therefore, the items were modified accordingly. The measure has six subscales, but the present study restricted to the following subscales: *Condom Use Avoidance Intentions, Perceived Social Norms for Avoiding Condom Use, and Perceived Behavioral Control for Avoiding Condom Use.*

Items within each subscale were summed to create three separate scores. *The Condom Use Avoidance Intentions* scale has three items and assesses the individual's intentions to avoid condom use in the next three months. Higher scores indicate stronger intentions to resist condom use in the next three months. Sample items include, "how likely would you be to try to avoid condom using a condom?" The *Perceived Social Norms for Avoiding Condom Use* scale has three items and assesses how the individual feels important people in their life feel about the avoidance of condoms. Higher scores indicate more positive norms for the resistance of condom use. Sample items include, "Do people in your life support or oppose you trying to avoid condom use with a sex partner who wants to use one?" The *Perceived Behavioral Control for Avoiding Condom Use* scale has six items and assesses perceived self-efficacy (i.e., perceived ability to avoid condom use). Higher scores indicate greater perceived self-efficacy of condom use resistance. Sample items include, "I am in complete control over whether I will try to avoid using condoms with my sex partner(s)." The internal reliability for the scales ranged from adequate to excellent and are as follows: intentions ($\alpha = .92$), norms ($\alpha = .73$), and perceived behavioral control/self-efficacy ($\alpha = .86/\alpha = .82$). Within the present sample, the alpha coefficient for intentions was $\alpha = .91$, norms was $\alpha = .74$. and self-efficacy was $\alpha = .86$.

Male condom use (see Appendix E)**.** Consistent with prior research (Abbey et al., 2007), condom use for both men and women was assessed with two items. The questions assessed how often they used a condom when they had sexual intercourse when sober and when drinking alcohol with any partner of the opposite sex. Responses were on a 7-point scale ranging from *Never (1)* to *Always (7).* Each item response represented typical frequency of condom use when sober and when drinking. A modification to the instructions was made to clarify the following questions referred to male condom use only (i.e., condom use including male condoms and

excluding female condoms). In addition, though the originally developed questions did not specify a time-frame, participants in the current study will be asked to consider instances across the last three months. Research supports retrospective recall of condom use to be accurate compared with daily diary reports (Graham, Catania, Brand, Duong, & Canchola, 2003; Jaccard, McDonald, Wan, Dittus, & Quinlan, 2002). However, to increase validity of condom use measurement, the present study considered prior recommendations and limited intervals for recall to three months (Noar, Cole, & Carlyle, 2006). Additionally, this time-frame aligned with the time-frames of the measures proposed in the study (i.e., DDQ and Condom Avoidance Measure).

Consistent with other recommendations to increase validity of condom use measurement, the present study also assessed a specific sex act (e.g., condom use at penetrative sexual intercourse including vaginal or anal sex; Noar et al., 2006) and assessed behaviors using measures of relative condom use (Schroder, Carey, & Vanable, 2003). It was recommended to assess specific sex acts, because condom use may vary based on different types of sex. In addition, measures of relative condom use, such as a Likert scale, are preferred in correlational studies and model-testing research (Schroder et al., 2003). Together, the present study addressed and incorporated these suggestions in order to improve validity of condom use measurement.

Sexual activity (see Appendix F)**.** Participants' sexual activity was assessed using three items. Participants were asked to report if they had engaged in penetrative sexual intercourse over the past year and over the past three months. They were asked to report how many sexual partners they had penetrative sexual intercourse with in the past three months. Also, participants were asked to report how many times in the past three months they had penetrative sexual intercourse with a sexual partner. These items were used to characterize the level of sexual

activity within the sample with higher scores indicating greater number of sexual partners and greater frequency of sexual intercourse. Evidence supports retrospective recall of sexual behavior to be accurate compared with daily diary reports (Graham et al., 2003; Jaccard et al., 2002). However, to increase validity of sexual frequency measurement, the present study limited intervals for recall of frequency items to three months. The three-month interval followed prior recommendations to increase validity of participant response (Noar et al., 2006). Also, this timeframe corresponded with the time-frames of the measures collected in the study (i.e., DDQ and Condom Avoidance Measure) and the condom use items.

Proposed Statistical Analyses

Data analytic plan. Descriptive statistics, bivariate correlations, and assumption analyses were conducted using IBM SPSS Statistics version 25. All model analyses were conducted using Mplus version 8.2 (Muthén & Muthén, 2017) using maximum likelihood estimation. Power and sample size calculations followed guidelines provided by Kline (2015) to estimate the theoretical model and conduct gender invariance testing. Path analysis was used to estimate direct, indirect, and total effects between observed model variables. Specifically, nonparametric bootstrapping analyses were used to estimate path coefficients and 95% bias corrected and accelerated confidence intervals. Path coefficients were deemed significant if $p < .05$. Mediation was considered significant if the confidence intervals for the indirect effect based on 1000 bootstrapped samples did not include zero (Preacher & Hayes, 2004). Independent variables included alcohol use, sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy, and condom use resistance intentions. The dependent variable was intoxicated condom use.

Hypotheses testing.

Aim 1. To examine the bivariate correlations between all model variables, bivariate correlations were used to determine the strength and direction of each link in the proposed model.

Aim 2. To examine the direct effects in the proposed conceptual model, a path analysis was conducted. Prior to examining Aims 2a, 2b, and 2c, as well as subsequent aims, model fit was assessed and reported. Model chi-square was used as an approximate fit index (Kline, 2015). Acceptable model fit was indicated by a $p > .05$. In addition, other fit indices were considered to determine quality of model fit. These indices include: Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean square Residual (SRMR). Good model fit was shown if CFI > .95, RMSEA < .06, and SRMR < .08 (Schreiber, Nora, Stage, Barlow, & King, 2006; Weston & Gore, 2006).

If model fit was found to be unsatisfactory, then potential options to construct a model more representative of the data were considered. The Akaike Information Criteria (AIC) was used to determine improvement to the model fit. This fit index was used because we were comparing non-nested models. Lower AIC values were considered to reflect improved model fit (Kenny, n.d.; Schreiber et al., 2006). Other model fit indices (i.e., CFI, RMSEA, and SRMR) were also taken into account. After model improvement was determined, theoretical plausibility of the model modification was considered. Once sufficient fit of a theoretically plausible model was attained, hypothesis testing was conducted.

Nonparametric bootstrapping analyses were used to estimate the direct effect path coefficients. This process involves the repeated generation of sampling distributions based on the obtained sample. Bootstrapping then used the empirically estimated sampling distributions to construct estimated path coefficients for the following direct effects: alcohol use on condom

use, alcohol use on condom use resistance intentions, and condom use resistance self-efficacy on condom use. These direct effects were estimated while controlling for the effects of all the other variables in the model. The direct effect was considered significant if $p < .05$.

Aim 3. To test each sequential mediation pathway from alcohol consumption to condom use, path analysis was conducted. Specifically, three paths were examined separately. For each path, the independent variable is alcohol use, and the dependent variable is condom use. The mediators were as follows: sex-related alcohol expectancies (Aim 3a), condom use resistance norms (Aim 3b), condom use resistance self-efficacy (Aim 3c). Frequency of penetrative sexual intercourse over the past three months and partner type were included as covariates in analyses.

To test mediation, the three serial mediation pathways were estimated simultaneously. Significance of the indirect effects were tested using nonparametric bootstrapping analyses. Bootstrap analyses involved the generation of sampling distributions by repeatedly resampling the obtained sample. Bootstrapping then used the empirically estimated sampling distributions to construct estimated path coefficients for the mediation (Hayes, 2009; MacKinnon, Fairchild, & Fritz, 2007). Mediation was significant if the 95% bias corrected and accelerated confidence intervals for the indirect effect based on 1000 bootstrapped samples did not include zero (Preacher & Hayes, 2004).

Aim 3d was to test the relative strength of each sequential mediation pathway from alcohol consumption to condom use. To test Aim 3d, path analysis was conducted to determine the relative strength of each mediator (i.e., sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy) in the relationship between alcohol use and condom use. Specifically, bootstrapping (see Aim 3) was used to estimate the three mediation pathway coefficients and mediation significance. Each mediation pathway was

comprised of three segments known as paths. Path a was the connection between alcohol and belief (i.e., sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy). Path b was the connection between belief and condom use resistance intentions. Finally, path c was the connection between condom use resistance intentions and condom use. Beta weights for path a, b, and c were multiplied to determine the sum indirect effect. The sum indirect effect of each mediation pathway was compared to conclude which mediation pathway was the strongest for the entire sample. The mediation pathway which carried the highest sum indirect effect of path beta weights was considered to account for the greatest overall effect.

Aim 4. To examine potential gender differences in each sequential mediation pathway from alcohol consumption to condom use and compare the relative strength of each sequential mediation pathway from alcohol consumption to condom use within each gender. The aim was examined through invariance testing. Specifically, potential variances in the complete estimated model between men and women were tested in an omnibus multiple group analysis. A chi-square difference test was conducted in Excel to determine whether the constrained model with all participants was significantly different in fit than the unconstrained model. The unconstrained model allowed path coefficients to be free to vary based on gender. The total model was deemed to vary between men and women if the chi-square difference test between the unconstrained and constrained models was significant with $p < .05$. This significant difference suggested the complete model allowed to freely vary based on gender fit the data better than the gender constrained model.

To investigate gender differences within specific parameters, the constraints for the given path of interest would be released while maintaining constraints on the rest of the model. If there

was a significant chi-square difference between the constrained model and unconstrained model for the specific path of interest, then that path would be concluded to vary based on gender. Confidence intervals would then be examined to determine if the mediation pathway was significant for both or either of the male and female models. The indirect effect would be considered significant if the 95% bias corrected and accelerated confidence intervals did not contain zero (Preacher & Hayes, 2004). Additionally, the sum indirect effects would be examined to assess if the mediation path was stronger for one gender or the other. This information would be used to characterize the potential gender differences within each of the mediation pathways.

To compare the relative strength of each sequential mediation pathway from alcohol consumption to condom use within each gender. Path analysis would be conducted for each gender to determine which mediators were significant (Muthén & Asparouhov, 2002). Significance of the indirect effects would be tested using bootstrapping (see Aim 3). Within the model for each gender, beta weights of the mediation pathways would be used to calculate the sum indirect effect (see Aim 3d). The mediation pathway which carried the highest sum indirect effect would be considered to account for the greatest effect. This process would help elucidate which sequential mediation pathway carried the greatest indirect effect for a male versus female model.

CHAPTER III

RESULTS

Power analysis. According to Kline (2016), sample size power analysis for a path analysis model can follow a 20:1 ratio, such that 20 participants are necessary for each parameter. The current study utilized 7 parameters of interest (i.e., alcohol use, sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy, condom use resistance intentions, condom use, and sexual frequency). Following the 20:1 ratio, 140 participants were necessary for the 7 parameters. Give this, the power analysis resulted in a target sample of 140 participants. However, to examine the proposed model by gender, as proposed in Aim 4, a total final target sample of 280 participants was needed.

Missing data and outliers. Missing data and outliers were addressed prior to conducting analyses. Of the final sample consisting of 274 participants, 7 responses (2.5%) had two items with missing data and 46 responses (16.6%) had missing data on one item, with complete data on all other remaining variables. Missing data for continuous variables was handled with expectation maximization imputation method. Path analysis employs maximum likelihood estimation. Therefore, the remaining missingness was accounted for and addressed in the final sample (Kline, 2015). Extreme outliers more than three interquartile ranges were identified using box plots and Winsorized to the next closest data point within the acceptable range. For the DDQ, four positive values (191, 51, 43, 43) were Winsorized to a value of 35. With these changes, all the values fell within three interquartile ranges of the median. For the past month frequency of sexual intercourse, 14 positive values (300, 60, 60, 50, 50, 50, 50, 50, 50, 50, 50, 45, 45, 45) were Winsorized to a value of 40. The values fell within three interquartile ranges of the median. Due to the extremity of these cases, the impact of these people on the model was

explored. The theoretical model was estimated with and without these individuals. No differences in model fit or estimated effects were found. Therefore, to maximize power they were retained in the sample. No outliers were found for CUR subscales or SSREAS variable.

Statistical assumptions. The assumptions for linear regression were assessed and addressed. To test the normality assumption, histograms and Q-Q plots were used to assess normality, skewness, and kurtosis. DDQ total weekly quantity and sexual intercourse frequency over past three months were slightly positively skewed. However, their skewness values were not extreme enough to justify the conclusion of a violated assumption. Therefore, no variable transformations were made, and normality was assumed. Scatterplots of the unstandardized residuals were used to test the linearity assumption. Results showed that the IV (alcohol use) and DVs (CUR-I and intoxicated condom use) were linearly related. The assumption that all relevant variables are included in the model was upheld by using prior research and theory. The next assumption, that all variable measures are error free, was satisfied by using measures which have been shown to have high validity. In addition, these measures showed good internal consistency within this sample (see Table 2). The fifth and sixth assumptions posit that residuals are constant and exhibit independence. To assess these assumptions, scatterplots of the residuals were made. These showed that variance of a variable was not contingent upon the value of that variable. There was no clustering across the variables either to suggest that variance was related. Taken together, homoscedasticity and independence were assumed.

Table 2

Internal Consistency of Study Variables

Variable	Cronbach's Alpha		
	Total Sample	Males	Females
SRAE	.89	.85	.80
CUR-N	.74	.80	.90
CUR-SE	.86	.85	.69
CUR-I	.91	.82	.87
Total CUR	.81	.96	.89

Note. SRAE = Sex Related Alcohol Expectancies; CUR-N = Condom Use Resistance Norms; CUR-SE = Condom Use Resistance Self-Efficacy; CUR-I = Condom Use Resistance Intentions

Descriptive statistics. Overall, the sample reported the consumption of an average of 8.55 (*SD* = 7.60) standard drinks in a typical week. The sample reported an average total frequency of sexual intercourse over the past three months as 10.53 times (*SD* = 10.98). Participants endorsed sex-related alcohol expectancies at an average of 42.11 (*SD* = 13.07). The average is almost central to the range of endorsement (13-78). Participants perceived social support for the resistance of condom use to be an average of 7.54 (*SD* = 5.38). This reflects a low-level of social norms for condom use resistance (i.e., participants reported more negative than positive normative perceptions of condom use resistance) given the potential range of 3-21. Condom use resistance self-efficacy was an average of 25.93 (*SD* = 9.72) out of a possible range of 6-42. This average suggests the sample's perceived ability to resist condom use is higher than their inability to resist. Further descriptive statistics of the model variables can be found in Table 3.

Table 3

Descriptive Statistics on Study Variables by Gender and Total Sample

Variable	Men *M (SD)*	Women *M (SD)*	Total *M (SD)*
DDQ	9.15 (9.28)	8.40 (7.17)	8.54 (7.60)
SRAE	46.90 (9.93)	40.99 (13.48)	42.11 (13.07)
CUR-N	9.46 (6.26)	7.09 (5.07)	7.54 (5.38)
CUR-SE	25.00 (9.20)	26.15 (9.85)	25.93 (9.73)
CUR-I	9.77 (6.05)	7.84 (5.48)	8.21 (5.64)
Condom Use	3.81 (2.12)	4.03 (2.22)	3.99 (2.19)
Sexual Intercourse Frequency	10.02 (10.66)	10.65 (11.08)	10.53 (10.98)

Note. DDQ = Daily Drinking Questionnaire; SRAE = Sex Related Alcohol Expectancies; CUR-N = Condom Use Resistance Norms; CUR-SE = Condom Use Resistance Self-Efficacy; CUR-I = Condom Use Resistance Intentions.

Data collection method difference check. To confirm there were no differences between the individuals sampled in-person versus online, a chi-square difference test and series of independent *t*-tests were conducted. The chi-square difference test of gender by data collection method was not significant, $\chi^2(1) = 2.30$, $p = .129$. In-person participants were not significantly different than online participants on all model variables except for frequency of sexual intercourse. Thus, this was covaried in the final model.

Statistical analysis testing Aim 1. Study Aim 1 was to examine the bivariate correlations between all model variables: alcohol use, sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy, condom use resistance intentions, and condom use. It was hypothesized that sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy would be positively related to alcohol use as well as condom use resistance intentions. However, condom use resistance self-efficacy and condom use resistance intentions were expected to be negatively related to condom use. Bivariate correlations were used to determine the strength and direction of each link in the proposed model. These correlations between study variables can be found in Table 4. The positive bivariate correlations of alcohol use with condom use resistance norms and condom use resistance self-efficacy were not significant. However, the correlation between sex-related alcohol expectancies and alcohol use was significant (r = .137). Additionally, sex-related alcohol expectancies (r = .366), condom use resistance norms (r = .314), and condom use resistance self-efficacy (r = .216) were positively, significantly correlated with condom use resistance intentions. Also, condom use resistance self-efficacy (r = -.184) and condom use resistance intentions (r = -.417) were significantly, negatively associated with condom use.

Table 4

Intercorrelations among Study Variables

Variable	1	2	3	4	5	6	7
1. DDQ	-						
2. SRAE	.137*	-					
3. CUR-N	.028	.171**	-				
4. CUR-SE	-.066	.191**	.127*	-			
5. CUR-I	.057	.366**	.314**	.216**	-		
6. Condom Use	-.066	-.290**	-.254**	-.184**	-.417**	-	
7. Sexual Intercourse Frequency	.162**	.060	.033	.044	.166**	-.237**	-

Note. DDQ = Daily Drinking Questionnaire; SRAE = Sex Related Alcohol Expectancies; CUR-N = Condom Use Resistance Norms; CUR-SE = Condom Use Resistance Self-Efficacy; CUR-I = Condom Use Resistance Intentions.

* $p < 0.05$; ** $p < 0.01$.

Model fit. Prior to testing the subsequent aims, model fit for the model was examined. Results found the proposed theoretical model to have poor fit, $\chi^2(11) = 44.21$, $p < .001$, CFI = .805, RMSEA = .105, SRMR = .066. Given this, prospective options to construct a model more representative of the data were considered.

Model modifications. To obtain good model fit, model modifications were considered. The suggested modification indices that were conceptually appropriate were to add correlations between the three beliefs: sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy. Other extraneous factors may be jointly impacting these variables. Therefore, by correlating these beliefs, this issue may be addressed. The original conceptual model fit was poor [AIC = 13,060.28, $\chi^2(11) = 44.21$, $p < .001$, CFI = .805, RMSEA = .105, SRMR = .066]. By adding these paths between sex-related alcohol expectancies and condom use resistance norms, sex-specific alcohol expectancies and condom use resistance self-efficacy, and condom use resistance norms and self-efficacy, the result was a model with improved fit [AIC = 13,044.27, $\chi^2(8) = 22.19$, $p < .001$, CFI = .917, RMSEA = .080, SRMR = .040]. Specifically, we see that the AIC value decreased. In addition, the other fit indices CFI, RMSEA, and SRMR were improved to approaching acceptable ranges (i.e., CFI > .95, RMSEA < .06, and SRMR < .08; Weston & Gore, 2006). All three correlations were found to be significant with alpha values less than .05. Sex-related alcohol expectancies was positively correlated with condom use resistance norms ($r = .173$, $p = .003$) and resistance self-efficacy ($r = .213$, $p < .001$). Also, condom use resistance norms were positively correlated with resistance self-efficacy ($r = .128$, $p = .031$). Given that the model fit indices were improved, and the correlations were significant, these modifications were retained in the fitted model.

Model covariates. Some evidence suggests that part of condom use behavior may be explained by the use of other contraceptives (Critelli & Suire, 1998; East, Jackson, O'Brien, & Peters, 2007). Given this, the use of other birth-control methods was considered as a covariate of intoxicated condom use. The variable was categorical. Responses were separated by no birth control beyond condom use or no birth control use (1), daily contraceptive use (i.e., the pill; 2), monthly contraceptive use (i.e., Nuva Ring, Depo shot, or birth control patch; 3), multiple year contraceptive use (i.e., Nexplanon arm implant or Intrauterine Device; 4), and sterilization/vasectomy (5). Descriptive statistics of participants birth control methods can be seen in Table 5. The previous fitted model fit was poor [AIC = 13,044.27, $\chi^2(8) = 22.19$, $p <$ .001, CFI = .917, RMSEA = .080, SRMR = .040]. When birth control was added as a covariate of intoxicated condom use, the model fit indices were as follows: AIC = 13,421.41, $\chi^2(12) =$ 27.92, $p = .006$, CFI = .910, RMSEA = .070, SRMR = .041. Birth-control method was found to be a significant predictor of intoxicated condom use, $\beta = .129$, S.E. = .052, $p = .014$. While the AIC value is larger, suggesting worse fit, the RMSEA value was improved. Given that the covariate path was theoretically relevant, significant, and model fit was improved, as seen in the RMSEA fit index, birth-control method as a covariate of intoxicated condom use was retained in further model fitting.

Table 5

Descriptive Statistics on Birth Control Method

Birth Control Method	Men n (%)	Women n (%)	Total n (%)
Condoms Only or No Birth Control	26 (50.0)	96 (43.2)	122 (44.5)
Daily Type	16 (30.8)	80 (36.0)	96 (35.0)
Monthly Type	1 (1.9)	17 (7.7)	18 (6.6)
Multiple Year Type	7 (13.5)	26 (11.7)	33 (12.0)
Sterilization/Vasectomy	0 (0.0)	2 (0.9)	2 (0.7)
Missing	2 (3.8)	1 (0.5)	3 (1.1)

Note. Daily contraceptive use includes the pill used by the respondent or their partner. Monthly contraceptive use includes Nuva Ring, Depo shot, and the birth control patch used by the respondent or their partner. Multiple year contraceptive use includes Nexplanon arm implant and Intrauterine Devices.

Sexual frequency and relationship type's potential associations with other model variables were considered. The suggested modification indices regarding sex frequency and relationship type (i.e., partner type) were minimal. The largest recommended modification indices were as follows: relationship type predicting sex-related alcohol expectancies, M.I. = 8.45; relationship type predicting condom use resistance intentions, M.I. = 6.74; and sex frequency predicting condom use resistance intentions, M.I. = 6.21. As previously noted, the modified model with the correlations and the new covariate birth-control method had a fit of AIC = 13,421.41, $\chi^2(12) = 27.92$, $p = .006$, CFI = .910, RMSEA = .070, SRMR = .041. When the three covariates listed above were added to the model, fit was improved each time, [(adding relationship type predicting sex-related alcohol expectancies) AIC = 13,414.81, $\chi^2(11) = 19.32$, $p = .056$, CFI = .953, RMSEA = .053, SRMR = .040; (adding relationship type predicting condom use resistance intentions) AIC = 13,409.76, $\chi^2(10) = 12.62$, $p = .268$, CFI = .987, RMSEA = .029, SRMR = .032; (adding sex frequency predicting condom use resistance intentions) AIC = 13,407.62, $\chi^2(9) = 8.12$, $p = .522$, CFI = 1.00, RMSEA = .00, SRMR = .025]. Relationship type was found to significantly predict sex-related alcohol expectancies ($\beta = -.172$, S.E. = .057, $p = .003$) and condom use resistance intentions ($\beta = .124$, S.E. = .056, $p = .026$). Also, frequency of sexual intercourse was found to significantly predict condom use resistance intentions ($\beta = .112$, S.E. = .055, $p = .041$). Each of these modifications reduced the model's AIC value. In addition, the other fit indices CFI, RMSEA, and SRMR were improved to satisfactory ranges (i.e., CFI > .95, RMSEA < .06, and SRMR < .08; Weston & Gore, 2006).

Given these improvements, the theoretical plausibility of these covariates was considered. First off, relationship type as a covariate of condom use resistance intentions makes theoretical sense. Broadly, we see that individuals in steady relationships have more defined sexual

behavior patterns as compared to those in casual or new relationships (Brown & Vanable, 2007; LaBrie et al., 2005). Thus, condom use intentions among those in steady relationships may be reflective of these set condom use behaviors (Sanderson & Jemmott, 1996; Wang, 2013). While the association between relationship type and condom use *resistance* intentions has not been explored, it may be expected that we would see similar results. Taking the broad literature on condom use intentions with the present significant result, it is theoretically and empirically plausible to retain relationship type as a covariate of condom use resistance intentions within the conceptual model.

Moreover, it is possible that the frequency an individual engages in sexual intercourse is connected to condom use resistance intentions. No known research has examined this specific relationship. However, numerous studies have examined frequency of sexual intercourse and condom use (for review see Sheeran et al., 1999). These studies have shown frequency of sex is negatively associated with condom use. Considering the logistics of condom use, purchasing condoms and having them readily available may be seen as a challenge (Sarkar, 2008), especially among individuals who are frequently having sex. Following this line of thinking, it may be that the more you have sex the more you intend to resist condom use. This theoretical plausibility paired with the present positive association between frequency of sex and condom use resistance intentions supports the inclusion of this covariate relationship. Thus, frequency of sexual intercourse was kept as a covariate of condom use resistance intentions in the model.

Furthermore, it makes theoretical sense that the type of relationship or sexual partner you have would influence your expectancies regarding alcohol as it relates to sex. Alcohol use may play a different role for those actively dating as compared to individuals in committed relationships. For example, drinking-focused social situations may be pursued as a method of

meeting potential partners (Davies & Windle, 2000). Thus, sexual expectations regarding alcohol use may differ between individuals casually dating and those in steady relationships. Evidence supports this potential difference. Individuals who are single and dating have stronger sex-related alcohol expectancies as compared to those who are not dating and those who are in a relationship (Pedersen et al., 2009). Given this theoretical and empirical evidence, relationship type as a covariate of sex-related alcohol expectancies was retained in the fitted model.

As noted above, the use of alcohol may differ between individuals in steady relationships and those in non-steady relationships. Thus, it makes theoretical sense that relationship type might be a covariate of alcohol use and was explored. The last model fit indices were as follows: AIC = 13,407.62, $\chi^2(9) = 8.12$, $p = .522$, CFI = 1.00, RMSEA = .00, SRMR = .025. When relationship type was added as a covariate of alcohol use, model fit was worse on all the listed fit indices [AIC = 13,425.47,$\chi^2(11) = 19.98$, $p = .046$, CFI = .954, RMSEA = .055, SRMR = .038] despite the significance of this link ($\beta = -.198$, S.E. = .058, $p = .001$). Therefore, relationship type as a covariate of alcohol use was not kept in the final fitted model (Figure 5).

In sum, multiple model covariates were considered when fitting the model. Birth control was added to the model as a covariate of intoxicated condom use. Frequency of sexual intercourse was included as a covariate of condom use resistance intentions. Relationship type was included as a covariate of condom use resistance intentions and sex-related alcohol expectancies and excluded as a covariate of alcohol use. These new covariate additions can be seen below in the final fitted theoretical model (Figure 5).

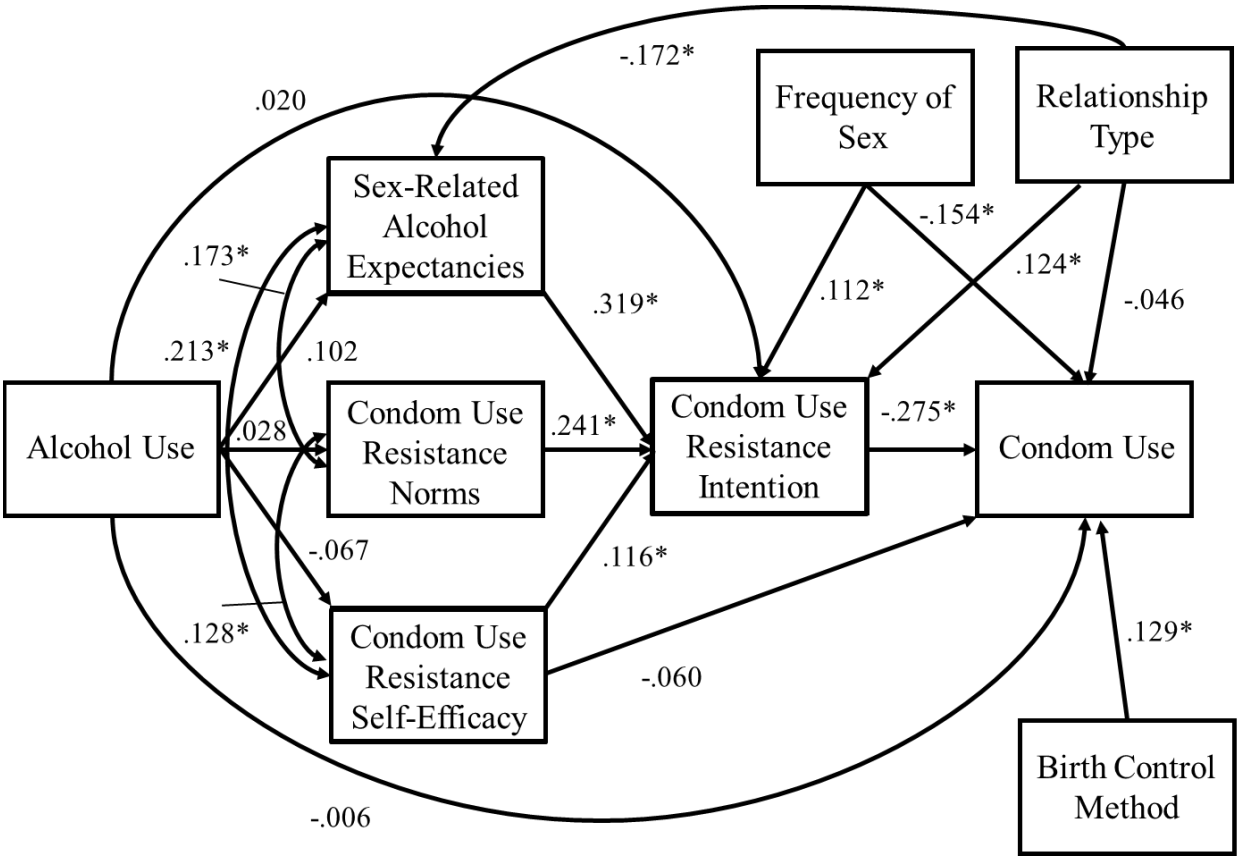

Figure 5. Results of the direct and indirect effects between study variables from the fitted model. Path coefficients are standardized estimates, where *$p < .05$.

The final fitted model included nine variables. The equation to calculate the number of observations within the data is $k(k + 1)/2$ (k = number of variables). Thus, the fitted model included 45 observations. Degrees of freedom is the number of observations minus the number of parameter estimations. The specified model included 36 parameter estimations. Therefore, we were left with nine degrees of freedom for the fitted theoretical model.

Statistical analysis testing Aim 2. Study Aim 2 was to examine the direct effects in the proposed conceptual model (see Figure 5).

Aim 2a. Study Aim 2a was to examine the direct effect of alcohol use on condom use. It was hypothesized that alcohol use would have a direct negative effect on condom use. The direct link from alcohol use to condom use was not significant ($p = .915$; see Table 5).

Aim 2b. Study Aim 2b was to examine the direct effect of alcohol use on condom use resistance intentions. It was expected that alcohol use would have a direct positive effect on condom use resistance intentions. The direct link from alcohol use to condom use resistance intentions was not significant ($p = .718$).

Aim 2c. Study Aim 2c was to examine the direct effect of condom use resistance self-efficacy on condom use. It was hypothesized that condom use resistance self-efficacy would have a direct negative effect on condom use. The direct association between condom use resistance self-efficacy and condom use was not significant ($p = .272$).

Statistical analysis testing Aim 3. Study Aim 3 was to test each sequential mediation pathway from alcohol consumption to condom use (see Figure 5 and Table 5).

Table 6

Direct and Specific Indirect Effects from Fitted Theoretical Model

	β	95% BC CI	SE	*p*
DDQ → Condom Use	-.006	N/A	-.107	.915
DDQ → CUR-I	.020	N/A	.361	.718
CUR-SE → Condom Use	-.060	N/A	-1.098	.272
DDQ → SRAE → CUR-I → Condom Use	-.009	[-.008, .000]	.009	.307
DDQ → CUR-N → CUR-I → Condom Use	-.002	[-.001, .001]	.003	.538
DDQ → CUR-SE → CUR-I → Condom Use	.002	[.000, .003]	.003	.495

Note. DDQ = Daily Drinking Questionnaire; SRAE = Sex Related Alcohol Expectancies; CUR-N = Condom Use Resistance Norms; CUR-SE = Condom Use Resistance Self-Efficacy; CUR-I = Condom Use Resistance Intentions.

Aim 3a. Study Aim 3a was to examine the indirect relationship between drinking and condom use through its association with *sex-related alcohol expectancies* and condom use resistance intentions. It was hypothesized that increased alcohol use would be associated with more sex-related alcohol expectancies, which in turn would be associated with more condom use resistance intentions and then decreased condom use during intoxicated sexual encounters. Path analysis was conducted to investigate the relationship between alcohol use and condom use as mediated by sex-related alcohol expectancies and condom use resistance intentions. Specifically, nonparametric bootstrapping analyses generated empirically estimated sampling distributions to construct estimated path coefficients for the mediation (MacKinnon, Fairchild, & Fritz, 2007; Hayes, 2009). Mediation was considered significant if the 95% bias corrected and accelerated confidence intervals (BC CI) for the indirect effect based on 1000 bootstrapped samples did not include zero (Preacher & Hayes, 2004). As such, the serial mediation path from alcohol use to sex-related alcohol expectancies then condom use resistance intentions and finally condom use was not significant, β = -.009 with 95% BC CI [-.008, .000].

Aim 3b. Study Aim 3b was to examine the indirect relationship between drinking and condom use through its association with *condom use resistance norms* and condom use resistance intentions. It was hypothesized that alcohol use would be associated with less condom use through an increase in condom use resistance norms and an increase in condom use resistance intentions. Path analysis was conducted to investigate the relationship between alcohol use and condom use as mediated by condom use resistance norms and condom use resistance intentions. The serial mediation path from alcohol use to condom use resistance norms then condom use resistance intentions and finally condom use was not significant, β = -.002 with 95% BC CI [-.001, .001].

Aim 3c. Study Aim 3c was to examine the indirect relationship between drinking and condom use through their association with *condom use resistance self-efficacy* and condom use resistance intentions. It was hypothesized that increased alcohol use would be associated with more condom use resistance self-efficacy, which in turn, would be associated with increased condom use resistance intentions and then decreased condom use. Path analysis was conducted to investigate the relationship between alcohol use and condom use as mediated by condom use resistance self-efficacy and condom use resistance intentions. The serial mediation path from alcohol use to condom use resistance self-efficacy then condom use resistance intentions and finally condom use was not significant, $\beta = .002$ with 95% BC CI [.000, .003].

Aim 3d. Study Aim 3d was to compare the relative strength of each sequential mediation pathway from alcohol consumption to condom use. It was hypothesized that the specific mediation effect of condom use resistance self-efficacy would be the strongest when compared to sex-related alcohol expectancies and condom use resistance norms. The specific (i.e., sum) indirect effect was calculated by multiplying the beta weight from paths a (i.e., alcohol to belief), b (i.e., belief to intentions), and c (i.e., intentions to condom use) for each serial mediation pathway. The results showed the sum indirect effects for each serial mediation were as follows: sex-related alcohol expectances ($\beta = -.009$), condom use resistance self-efficacy ($\beta = .002$), and condom use resistance norms ($\beta = -.002$). Negative indirect effects (i.e., sex-related alcohol expectancies and condom use resistance norms) mean alcohol use decreases condom use through the given belief and condom use resistance intentions. Positive sum indirect effects (i.e., condom use resistance self-efficacy) indicate alcohol use increases condom use through the given belief and condom use resistance intentions. The sum indirect effects for sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy with

condom use resistance intentions were all non-significant mediation effects. Therefore, a comparison of the belief's strength was not conducted.

Statistical analysis of Aim 4. Study Aim 4 was to examine potential gender differences in each sequential mediation pathway from alcohol consumption to condom use and to compare the relative strength of each sequential mediation pathway from alcohol consumption to condom use within each gender.

To test complete model invariance, first, a structural invariance test was conducted to examine the unconstrained model, which allowed all model parameters to vary based on gender. Results found the unconstrained model to be good fit, $\chi^2(18) = 19.63$, $p = .354$, CFI = .990, RMSEA = .026, SRMR = .039. In the next step, a constrained model was assessed to examine the model with all parameters fixed for gender. Results also found this model to fit decently, $\chi^2(39) = 36.66$, $p = .577$, CFI = 1.00, RMSEA = .00, SRMR = .054. The unconstrained model had 21 less degrees of freedom than the constrained model. This was because, when estimating for two groups, 21 more path estimations for the total model must be made. Therefore, 21 more degrees of freedom were used up to estimate the unconstrained model. A chi-square difference test was used to compare the unconstrained and constrained models. Results found the two models to not be significantly different, $\Delta\chi^2 = 17.04$, $\Delta df = 21$, $p = .709$. Therefore, the results suggest the complete model does not differ based on gender.

To test specific mediation pathway invariance, a structural invariance test was conducted for each of the three mediation pathways. Specifically, a chi-square difference test between the unconstrained model, which allowed the path segments of a given mediation pathway to vary based on gender, and the constrained model was conducted. Results found that the mediation pathway through sex-related alcohol expectancies was not significantly different based on

gender, $\Delta\chi^2 = 3.31$, $\Delta df = 3$, $p = .347$. The unconstrained model had three less degrees of freedom than the constrained model. When estimating for two groups, three more estimations for the three individual path links within the mediation pathway must be made. Therefore, three more degrees of freedom were used up to estimate the gender-unconstrained model. This was also the case for the two following model invariance tests. The mediation pathway through condom use resistance self-efficacy was not significantly different based on gender, $\Delta\chi^2 = 1.28$, $\Delta df = 3$, $p = .735$. Finally, the mediation pathway through condom use resistance norms was also not significantly different based on gender, $\Delta\chi^2 = 5.28$, $\Delta df = 3$, $p = .153$.

Study Aim 4 also sought to compare the relative strength of each sequential mediation pathway from alcohol consumption to condom use within each gender. It was hypothesized that the relative strength of the sex-related alcohol expectancies mediation path will be the strongest compared to condom use resistance norms and condom use resistance self-efficacy for *men.* Additionally, it was hypothesized that condom use resistance self-efficacy will be the strongest compared to sex-related alcohol expectancies and condom use resistance norms in accounting for condom use for *women.* However, due to gender non-invariance of the complete model and the three specific mediation pathways, the proposed analyses to test these hypotheses were not conducted.

CHAPTER IV

DISCUSSION

The current study sought to test the association between alcohol use and condom use through various beliefs (e.g., sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy). Overall, it was predicted that alcohol use and condom use would be negatively related, and their relationship would be mediated by sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy, and condom use resistance intentions. It was expected that condom use resistance self-efficacy would be the strongest mediator in the overall model as compared to condom use resistance norms and sex-related alcohol expectancies. Further, it was hypothesized that the relationships in the proposed theoretical model would differ for men and women. It was predicted that sex-related alcohol expectancies would be the strongest mediator among men as compared to condom use resistance norms and condom use resistance self-efficacy. For women, it was predicted that condom use resistance self-efficacy would be the strongest as compared to sex-related alcohol expectancies and condom use resistance norms.

Aim 1: Associations between Alcohol Use, Beliefs, Intentions, and Condom Use

The first study aim examined whether drinking and condom use behavior was associated with sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy, and condom use resistance intentions. Prior research found that as alcohol use increases, sex-related alcohol expectancies, condom use resistance norms and condom use resistance self-efficacy increase as well (Leigh, 1990; Davis et al., 2016). Similarly, evidence supports a positive association between each of these three beliefs and condom use resistance intentions (Dermen & Cooper, 1994a; Davis et al., 2016). On the other hand, the body of

literature supports a negative association between condom use and alcohol use; condom use and condom use resistance self-efficacy; and condom use and condom use resistance intentions (Davis et al., 2016; Scott-Sheldon et al., 2016). Based on the cumulative literature, it was predicted that these variables would be correlated in these ways.

Some results were consistent with the literature whereas others were not. In line with prior research, the present results indicated that sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy were significantly, positively correlated with condom use resistance intentions. Also, in line with the literature, these three beliefs and condom use resistance intentions were significantly, negatively correlated with intoxicated condom use. Alcohol use was not significantly correlated with condom use resistance norms, condom use resistance intentions, or condom use. However, alcohol use was significantly correlated with sex-related alcohol expectancies. Despite most of these being non-significant, the resulting correlations were directionally (i.e., positive or negative relationship) in accordance with the literature. In contrast, while alcohol use was hypothesized to have a positive correlation with condom use resistance self-efficacy, results showed a weak, negative, and non-significant correlation. Taken together, most of the bivariate correlations in model accurately reflect and corroborate the current literature.

The assessment of some of these bivariate correlations contributed to the literature in several ways. First, it supported the application of TPB constructs (i.e., norms, self-efficacy, intentions, and behavior) in the context of condom use resistance and condom use (Davis et al., 2016). This provides further theoretical support for the links between behavioral beliefs, behavioral intentions, and behavior within the TPB model (Ajzen, 1991; Ajzen, 2005) and within the context of condom use resistance. Second, it examined the association of an important

cognitive construct not previously examined in the TPB framework or in relation to condom use resistance intentions, sex-related alcohol expectancies. Broadly, we see that expectancy beliefs from alcohol expectancy theory may be suited to function within TPB models of condom use.

Aim 2: Direct Effects

Alcohol use on condom use. The second study aim was to assess direct associations between behaviors and beliefs from the theoretical model. First off, a cumulation of prior evidence suggests alcohol use is associated with decreased condom use (Scott-Sheldon et al., 2016). Therefore, it was hypothesized that the alcohol-condom use link would show a negative association. Against expectations, the results showed a non-significant negative relationship between alcohol use and self-reported intoxicated condom use. Despite the use of recommendations to optimize data quality (Noar et al., 2006; Schroder et al., 2003), the general nature of the alcohol use and condom use measurement utilized in the present study may be related to this null finding. Specifically, participants were asked about general quantity of alcohol use and frequency of condom use across the past three months. Other measurement approaches include assessment of last event behavior (Brown & Vanable, 2007; LaBrie et al., 2005) or multiple specific events over time (Scott-Sheldon, Carey, & Carey, 2010; Sobell & Sobell, 1992). Thus, the present study's broader measurement may not have been sensitive enough to capture the actual associations.

Furthermore, it may also be possible that the effect of alcohol use on intoxicated condom use could have been explained by the other factors within the model. For instance, condom use resistance intentions explained a substantial amount of variance in condom use. Also, other independent variables including frequency of sexual intercourse, sex-related alcohol expectancies, and condom use resistance norms each explained some of the intoxicated condom

use. As a result of either non-specific measurement or variance taken by other model variables, the direct effect of alcohol use on condom use was not significant.

Alcohol use on condom resistance intentions. The second part of study Aim 2 was to assess the association between alcohol use and intentions to resist condom use. Previous evidence suggests intentions to resist the use of condoms increases with acute alcohol intoxication (Davis et al., 2016). Given this, it was expected that self-reported alcohol use and condom resistance intentions would be associated such that as alcohol use increases condom use resistance intentions increase too. However, the positive association between alcohol use and condom use resistance intentions was not significant. This null result could be because intentions to resist condom use are related to alcohol use at a given event and not at the broader level. The present study examined amount of typical weekly drinking from over the past three months. As such, the alcohol intoxication itself at a given event may be associated to increases in condom use resistance intentions whereas broader alcohol use patterns are not. Therefore, event-level approaches (e.g., last event, multiple events, or ecological momentary assessment) to studying drinking and condom use intentions may strengthen findings and provide greater detail to the dynamics of this potential relationship.

Condom resistance self-efficacy on condom use. The last part of study Aim 2 was to examine the link between condom use resistance self-efficacy and condom use. Theory of planned behavior (Ajzen, 2005) and empirical evidence (Abbey et al., 2007; Baele et al., 2001; Bandura, 1990; Barta et al., 2010; Carvalho et al., 2015; Lescano et al., 2007) support a connection between self-efficacy and behavior. Specifically, as condom use resistance self-efficacy increases condom use should decrease. Given this, it was expected that as an individual's belief in their own ability to resist condom use increases, self-reported condom use

would decrease. However, the relationship between condom use resistance self-efficacy and self-reported intoxicated condom use behavior was not significant. This null finding may be related to the type of condom use measured. The present study captured general frequency of intoxicated condom use, not frequency of condom use resistance. Thus, there may have been a disconnect between the perceived condom use self-efficacy and behavior measured. Future work may consider examining both condom use and condom use resistance to test if condom use resistance self-efficacy is better associated with resistance of condoms as compared to condom use or non-use.

Aim 3: Mediation from Alcohol to Condom Use through Beliefs

Alcohol to condom use through sex-related alcohol expectancies. The third study aim assessed whether specific beliefs (i.e., sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy, and condom use resistance intentions) operated as statistical mediators explaining the relationship between alcohol use and decreased condom use. Specifically, study aim 3a tested the indirect relationship between drinking and condom use through its association with *sex-related alcohol expectancies* and condom use resistance intentions.

Past literature found that individuals who drink alcohol more reported greater sex-related alcohol expectancies (Leigh, 1990) and that increases in both drinking and expectations of sexual effects after drinking were associated with lower condom use (Brown et al., 2016; Currin et al., 2017; Scott-Sheldon et al., 2016). In addition, prior evidence suggests that individuals who hold strong sex-related alcohol expectancies were more likely to have greater intentions to resist condom use (Davis et al., 2014a; Wegner et al., 2017). Taking all this literature together, it was

predicted that the alcohol-condom use link would be mediated by sex-related alcohol expectancies and condom use resistance intentions.

Against prediction, sex-related alcohol expectancies and condom use resistance intentions were not supported as mediators of the relationship between alcohol use and condom use. Upon examining the specific path links within the fitted model, alcohol use was not significantly associated with sex-related alcohol expectancies. However, sex-related alcohol expectancies were significantly, positively associated with condom use resistance intentions, which in turn, were significantly, negatively associated with condom use. These findings suggest expecting sexual effects after alcohol use is predictive of intentions to resist condoms, which in turn, predict intoxicated condom use. However, these expectancies are not associated with alcohol use. Thus, sex-specific alcohol expectancies do not explain some of the negative relationship between alcohol and condom use.

The lack of support for sex-related alcohol expectancies as a mediator may be related to differences in broad alcohol use and alcohol use in specifically sexual situations. General alcohol expectancies may be bolstered by current and future drinking behavior (Jones et al., 2001; Pabst et al., 2014; Palfai & Wood, 2001; Patrick et al., 2010). In contrast, drinking in potentially sexual situations may be what specifically contributes to the cultivation of sex-related alcohol expectancies (Dermen & Cooper, 1994a; George & Stoner, 2000; Leigh, 1990). Given this, the amount of alcohol consumed in possibly sexual situations may have been better suited as the proximal factor to sex-related alcohol expectancies within the present mediation pathway. Thus, future research should assess sex-specific alcohol use to determine if sex-related alcohol expectancies and condom use resistance intentions are contributing factors in the negative relationship between alcohol use in potentially sexual situations and intoxicated condom use.

Despite the non-significant mediation effect, the significant association between sex-related alcohol expectancies and condom use resistance intentions is a novel finding which addresses a gap in the literature on the link between these two variables. The literature on sex-related alcohol expectancies suggests that these sex-specific expectations are associated with an increased likelihood of having unprotected sex (Brown et al., 2016; Currin et al., 2017). However, it was unknown if active resistance of condom use played a contributing role in how alcohol and sex expectancies reduce condom use. The results do not support condom use resistance intentions as a mediator between alcohol use, sex-related alcohol expectancies, and intoxicated condom use. However, the results do suggest sex-related alcohol expectancies may be related to intentions to resist condom use. This contributes to previous notions that sex-related alcohol expectancies act as a self-fulfilling prophecy (George et al., 2000). The individual expects sex to be riskier after the consumption of alcohol. As a result, they may intend to engage in a behavior (e.g., condom use resistance) that will lead to the outcome they expect to occur after drinking (e.g., unprotected sex). The current study findings support that sex-related alcohol expectancies contribute to intentions to actively resist condom use. Further research is warranted to determine if together sex-specific alcohol expectancies and condom use resistance intentions contribute to decreased condom use when drinking.

Alcohol to condom use through condom resistance norms. Next, study aim 3b tested the indirect relationship between drinking and condom use through its association with *condom use resistance norms* and condom use resistance intentions. Prior research found that as compared to sober individuals, acutely intoxicated individuals reported increased condom use resistance norms (Davis et al., 2016). Also, a large body of literature on general condom use supports norms to be associated with condom intentions and use (Albarracin et al., 2001; Sheeran

et al., 1999). Therefore, it was expected that drinking would be associated with less condom use through an increase in condom resistance norms and an increase in intentions to resist condoms.

Against our predictions, condom use resistance norms and intentions were not supported as mediators of the relationship between alcohol use and condom use. Considering specific links in the mediation pathway, alcohol use was not significantly associated with condom use resistance norms. However, norms were positively associated with intentions, and in turn, negatively associated with condom use. These results suggest normative beliefs about the resistance of condom use is predictive of condom intentions, which in turn, predict condom use but is not associated with alcohol use. Thus, condom use resistance norms do not explain some of the negative relationship between alcohol and condom use.

This null finding may call into question the role of condom use norms as it relates to drinking. While existing research has shown that perceptions of peer alcohol-related sexual behavior is associated with one's own behavior (Lewis et al., 2007), many individuals misperceive the frequency that their peers engage in risky sexual behavior (Lewis et al., 2014). Sexual intercourse is typically a private act. Thus, individuals do not directly observe their peers or close friend's condom use or condom use resistance behavior. Therefore, there is a disconnect between what peer behavior is perceived and what behavior occurs. Additionally, because condom use is considered a safe sexual health behavior, efforts to resist condom use may not be readily disclosed to others. As a result, perceived norms of condom use resistance may not be salient to the intoxicated sexual behavior decision-making process.

Alcohol to condom use through condom resistance self-efficacy. Study aim 3c tested *condom use resistance self-efficacy* and condom use resistance intentions as potential mediators of the indirect relationship between drinking and condom use. Previous literature found that

individuals high in condom use self-efficacy have higher condom use intentions and actual condom use (Abbey et al., 2007; Baele et al., 2001; Bandura, 1990; Barta et al., 2010; Carvalho et al., 2015; Lescano et al., 2007). Increased intoxication has also been found to increase reports of condom use resistance self-efficacy and condom use resistance intentions (Davis et al., 2016). Therefore, it was predicted that increased alcohol use would be associated with higher condom use resistance self-efficacy, which in turn, would be associated with greater intentions to resist condom use and then decreased condom use.

Condom use resistance self-efficacy and intentions were not supported as mediators of the relationship between alcohol use and condom use. Considering specific paths within the complete mediation pathway, alcohol use was not significantly associated with condom use resistance self-efficacy. However, resistance self-efficacy was positively associated with condom use resistance intentions, and in turn, these intentions were negatively associated with condom use. These results suggest that while condom use resistance self-efficacy is associated with condom intentions and use, it does not explain a piece of the relationship between alcohol use and condom use.

The lack of support for condom use resistance self-efficacy as a mediator may be related to the global level of behavioral examination within the theoretical model. The present study examined alcohol use, condom intentions, condom use, and beliefs at a global level. Existing research clearly demonstrates the relationship between condom use self-efficacy, condom use intentions, and condom use (Abbey et al., 2007; Baele et al., 2001; Bandura, 1990; Barta et al., 2010; Carvalho et al., 2015; Lescano et al., 2007). However, limited research has studied condom resistance self-efficacy in the relationship between alcohol and risky condom use (Davis et al., 2016). This research supports the role condom efficacy beliefs in relation to condom

intentions for *both* sober and intoxicated individuals. However, after acute intoxication, individuals reported stronger perceived capability to resist the use of condoms (Davis et al., 2016). Thus, this in-the-moment intoxication may be more relevant to explaining the negative relationship between alcohol use and condom use as compared to more global drinking patterns. If this is the case, it may be that the intoxication effects are contributing to individuals feeling stronger about their ability to resist condom use (Davis et al., 2016). Given this, interventions aimed at alcohol-related sexual risk reduction should consider focusing on strengthening condom use self-efficacy which may permeate both individuals sober and intoxicated states.

Relative strength of mediation pathways. Study aim 3d compared the relative strength of the three potential mediators (i.e., sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy) of the alcohol-condom use link. Prior research had not compared the mediation effects of these specific key belief factors associated with risky sexual behavior. However, based on available evidence (Albarracin et al., 2001; Carvalho et al., 2015; Sheeran & Taylor, 1999), it was predicted that condom use resistance self-efficacy would be the strongest when compared to condom use resistance norms and sex-related alcohol expectancies.

Results from the fitted theoretical model showed that sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy were not significant mediators of the relationship between alcohol use and condom use. Since all three mediation pathways were not significant, a comparison of the strength of these three beliefs was not appropriate and thus not conducted. Therefore, no conclusions can be made about which belief matters most in the negative relationship between alcohol and condom use.

Aim 4: Gender Differences in the Relationship between Alcohol Use, Beliefs, Intentions, and Condom Use

The fourth study aim of the present study was to examine whether the sequential mediation paths within the theoretical model differed between men and women. Previous research supports the view that men and women differ in their endorsement of sex-related alcohol expectancies (Currin et al., 2017; LaBrie et al., 2002). However, the literature suggests that men and women do not differ on condom use resistance norms (Lewis et al., 2007; Lewis et al., 2014) nor condom use resistance self-efficacy (Abbey et al., 2007; Baele et al., 2001; Barta et al., 2010; Lescano et al., 2007). Therefore, it was predicted that the indirect effect for sex-related alcohol expectancies would differ between men and women; whereas, the indirect effects for condom use resistance norms and condom use resistance self-efficacy would not differ based on gender.

Against our predictions, the complete theoretical model and specific mediation pathways were not improved when gender varied freely, suggesting that the proposed beliefs do not mediate the relationship between alcohol use and condom use differently for men and women. There are several potential explanations for these null results. One is that individual level variables such as behavioral beliefs, normative beliefs, and efficacy beliefs are not gender specific. Prior research on condom use norms (Lewis et al., 2007; Lewis et al., 2014) and condom use self-efficacy (Abbey et al., 2007; Baele et al., 2001; Barta et al., 2010; Lescano et al., 2007) suggests these beliefs are similarly related to condom use among men and women. Regarding sex-related alcohol expectancies, they have been shown to be associated with condom use among men and women (Bryan et al., 2007; LaBrie et al., 2005). However, the association between sex-related alcohol expectancies and condom use has been less consistent with women

(Currin et al., 2017; LaBrie et al., 2002). It may be that these belief factors are not different based on gender. As such, the manifestation and influence of sex-related alcohol expectancies, condom-related normative beliefs, and perceived ability to use condoms may occur similarly for men and women. Thus, individual-level factors such as these may not be suited for gender-specific alcohol-related condom use interventions.

Another reason for the lack of gender differences could be due to the influence of gendered sexual scripts on heterosexual relationships. Cultural norms about sexuality informs what sexual behaviors and goals are appropriate for men and women (Simon & Gagnon, 1986). As such, these norms define the sexual scripts individuals may follow in a sexual situation. In Western cultures, women are expected to be passive and receptive to the sexually dominant and virile man (East, Jackson, O'Brien, & Peters, 2011; Seabrook, Ward, Cortina, Giaccardi, & Lippman, 2017). As a result, women's communication about and engagement in condom use and sexual behavior may be constrained in order to fulfill societal and relationship expectations. Given this and that men physically wear the condom, the responsibility and power to suggest condom use is deferred to the man (Wingood & DiClemente, 2000). As such, the power to resist condom use may be his as well. Following this line of thinking, the influence of heterosexual female's beliefs or behavioral intentions on condom use may be reflective of her partner's rather than her own. Either way, the various beliefs mediating the relationship between alcohol use and condom use do not differ significantly between men and women.

Another reason for the null finding with gender may be related to statistical power. The target sample for each gender was 140 participants. The resulting sample was 52 men and 222 women. Therefore, based on the guidelines provided by Kline (2015), the statistical analysis of invariance testing might have been under-powered to detect potential gender differences.

Which belief matters most to which gender? The final study aim was to assess the relative strength of the three potential mediators (i.e., sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy) of the alcohol-condom use link and determine potential gender differences in mediator strength. Prior literature suggested sex-related alcohol expectancies were associated with decreased condom use among men but not among women (Bryan et al., 2007; Currin et al., 2017). Therefore, it was hypothesized that sex-related alcohol expectancies would contribute to condom use to a greater degree than norms or self-efficacy among men. On the other hand, because women do not wear male condoms, their perceived ability to negotiate and use condoms may be more important than other belief factors including expectancies and normative perceptions (Nesoff et al., 2016). Given this, it was predicted that condom use resistance self-efficacy would be the strongest compared to sex-related alcohol expectancies and condom use resistance norms in accounting for condom use among women. However, as previously noted, the complete theoretical model and specific mediation pathways did not exhibit gender invariance; thus, the comparison of mediation effects within each gender were not conducted.

General Discussion

This was the first study to explore a theoretical model integrating TPB and alcohol expectancy theory to examine the indirect relationship between alcohol use and condom use through beliefs and condom use resistance intentions. Overall, we provided support for some study hypotheses. Results showed that as sex-related alcohol expectancies, condom use resistance norms and condom use resistance self-efficacy increase, intentions to resist the use of condoms increases. Also, results showed that as each of these beliefs increase, intoxicated condom use decreases. These findings are supported by prior research (Davis et al., 2016;

Dermen & Cooper, 1994a) and theoretical models (Ajzen, 1991). Consistent with the TPB, behavioral beliefs, normative beliefs, and efficacy beliefs are related to behavioral intentions and behavior. The TPB represents how different beliefs amount to what or how an individual intends to behave, which in turn, contribute to behavior. The associations found in the present study provide support for the structure posited by TPB in general and, specifically, in the context of risky alcohol-related condom use.

Given these findings, there are several theoretical implications. The theoretical structure relating beliefs, intentions, and behavior posited by TPB was supported even after integrating new concepts (e.g., sex-related alcohol expectancies and condom use resistance) into the hypothesized model. Thus, TPB persists as a versatile model which may be used to explain health behavior as the literature evolves. Findings also support the integration of TPB and alcohol expectancy theory. The examination of sex-related alcohol expectancies in TPB was a novel pursuit. Within the belief framework, expectations of performing a given behavior were supported as a replacement for general behavioral beliefs. Therefore, when TPB is used to explain intoxicated condom use, sex-related alcohol expectancies have a place in that belief framework. Future work should continue to integrate complimentary theories that are empirically supported to fully capture the belief-behavior relationship.

On a practical level, the resultant findings suggest a few things. Given the role of expected sexual effects of drinking on intentions to resist condom use, future efforts aimed at the improvement of safe sexual behavior when intoxicated could benefit from this information. One preventative approach could be psychoeducation on the observed effects of drinking on the sexual experience. For example, evidence has shown that alcohol use prior to or during sexual encounters does not enhance the sexual experience as compared to sober ones (Cooper, O'Hara,

& Martins, 2016). This finding was across individuals with strong and weak sex-related alcohol expectancies. Thus, the maintenance of such a belief is contradictory to most experiences, so may not be worth holding. While this approach may be helpful, more intensive approaches could utilize this information as well. Interventions could include a focus on challenging sex-related alcohol expectancies among sexually active college drinkers (for a review of expectancy challenge interventions see Scott-Sheldon, Terry, Carey, Garey, & Carey, 2012). For example, beliefs about alcohol's sexual effects would be challenged by demonstrating the effects of sex-related alcohol expectancies through the process of experiential learning in a simulated setting. By decreasing the expectations of sexual effects, individuals may be less likely to drink in sexual situations and more likely to use condoms, particularly while under alcohol intoxication.

Findings also suggest that the concept of condom use *resistance* is a worthwhile approach to understanding intoxicated condom use. Our findings from the current study, combined with the small body of relevant prior literature, support condom use resistance as a potential contributor to unprotected sex among drinkers. Thus, research that continues to use a passive perspective that individuals simply fail to put condoms on after drinking is failing to capture the picture of young adult condom use behavior. The perspective of actively refusing to use condoms studied in the current study suggests that resistance behavior is a contributing factor to engagement in unprotected sex after drinking. Future sexual health efforts should focus on addressing individual reasons (e.g., barrier to intimacy) for resisting the use of condoms to reduce their resistance intentions and improve condom use consistency.

Even though some results followed predictions, several study hypotheses were not supported. First, all three proposed mediators, sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy, were not found to significantly

mediate alcohol use and intoxicated condom use. These null results could have been the result of methodological decisions to use general measures of typical weekly drinking habits and condom use behavior. As such, the present study's assessment of general alcohol use and condom use behavior, rather than situation- or episode-specific behavior, may not have been sensitive enough to capture the proposed mediational relationships. Given this, future theoretical models could benefit from utilizing event-level assessment (i.e., study of behavior at a particular drinking event in which sex occurred) to clarify the present null results.

Second, the model was not found to be different for men as compared to women. Based on the literature, sex-related alcohol expectancies were expected to differ between men and women; whereas, condom use resistance norms and condom use resistance self-efficacy were not. The lack of gender effects could be the result of theoretical or statistical issues. Theoretically, the model could have been mis-specified with regards to gender-based alcohol-related condom use behavior. The cognitive beliefs were selected for their theoretical and empirical importance in the relation to intoxicated condom use behavior, overall. Thus, the model may have been mis-specified to pursue the present gender-based research question. Future work aiming to examine potential gender differences should consider more gender-specific factors (e.g., relationship power; Pulerwitz et al., 2002) instead of broader beliefs. Statistically, the lack of power could also be the reason for the null gender results. Based on the guidelines provided by Kline (2015), almost three times the present male sample would have been necessary to adequately power the gender invariance testing. Future studies should collect data from comparable samples of men and women to confirm or disconfirm the present study findings of no gender differences in the theoretical model.

Taken together, the present findings could inform future theoretical models of condom use. From a structural perspective, behavioral beliefs contribute to behavioral intentions which, in turn, predict behavior. Future models should include this structure to explain young adult's condom use. Regarding conceptualization of condom use behavior in future research, the present findings showed young adults do not just simply use or do not use condoms. To fully represent and explain condom use among young adults, models should include the notion that some people resist the use of condoms. Additionally, further models of condom use with the specific goal of capturing gender differences may benefit from considering the gendered nature of heterosexual relationships as context for condom use decision-making. By doing so, male- and female-specific constructs may show potential differences in the determinants of male and female condom use and capture gendered roles in the sexual decision-making process. All in all, the present study provides numerous findings that inform the future of theoretical condom use modeling.

Limitations and Future Directions

There are limitations to the current study. First, the study was cross-sectional with data collected at one time-point. The correlational data prevents conclusions regarding cause-effect relationships between variables. To help address this limitation in future research, multiple assessments of beliefs and behavior over time could help determine temporal precedence and covariation between variables. Further, ecological momentary assessment collects information at multiple time points across a drinking event while the individual is in their own environment. Such a design could lend more information to the dynamics between alcohol use, related beliefs, and behavioral outcomes across times and situations.

Another study limitation is generalizability of the findings. The present sample was mostly female (81.0%), which reduces generalizability to males. Also, the low percentage of male participants in the final sample resulted in a lack of power to assess gender differences. Further, although the population of interest was college students who are sexually active (e.g., any college student who had sex in the past year), 28.8% of the present sample reported having sex two or less times in the past three months. Given these low levels of sexual activity among some participants, it could be that generally less sexually active individuals may be unlikely to have sex during drinking events. This may have impacted results by including reported beliefs and behavior that do not occur together, which in turn weakened the model relationships. Similarly, the population of interest was students who consume alcohol (e.g., any college student who drank alcohol within the past year). However, 11.6% of the sample reported drinking one or two alcoholic beverages in a typical week in the past three months, and 9.5% reported no drinking in a typical week. Given these low levels of alcohol use among some participants, it could be that individuals who consume alcohol less frequently are less likely to have intoxicated sexual intercourse. Similar to the low levels of sexual intercourse, the low levels of drinking may have impacted results by including reports of beliefs which are supposed to be predictive of intoxicated sexual behavior. However, in reality, intoxicated sexual intercourse and condom use may not be occurring. In turn, this potential disconnect could have weakened the links between model variables. Thus, future work may consider testing these hypotheses with a sample who specifically report engagement in sexual intercourse while intoxicated to ensure a target sample that engages in the risky sexual behaviors examined.

Finally, another study limitation is the exclusion of other potentially important variables. Despite aims to build and test a comprehensive model of alcohol-related condom use, no model

can include all relevant components explaining the behaviors of interest. As a result, the current model did not include other mechanisms shown to be associated with alcohol use. Future research may consider drinking motives, impulsivity, and affective state as these constructs have been showed to impact drinking and subsequent behavioral outcomes.

CHAPTER V

CONCLUSIONS

The present study was the first to explore a theoretical model with integrated theories examining the indirect relationship of alcohol use and condom use through beliefs and condom use resistance intentions. Specifically, the study aimed to test sex-related alcohol expectancies, condom use resistance norms, condom use resistance self-efficacy, and condom use resistance intentions as potential mediators of the alcohol-condom use link, as well as examine potential gender differences in the relationships between these variables. Overall, findings suggest that sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy are related to condom use resistance intentions and intoxicated condom use. Sex-related alcohol expectancies, condom use resistance norms, and condom use resistance self-efficacy were not supported as mediators. Additionally, the theoretical model was not found to differ based on gender. Our findings contributed to the literature on alcohol-related condom use by integrating two complimentary theories in an attempt to explain how beliefs contribute to intoxicated condom use among sexually active college students. Future research on the negative relationship between alcohol use and condom use may benefit from event-level or ecological momentary assessment in order to parse apart belief and intoxication effects on intoxicated condom use.

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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 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): _____

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

6) What is your sexual orientation?
   a. Heterosexual
   b. Homosexual
   c. Bisexual
   d. Asexual
   e. Other (please specify): _____

7) What is your current relationship status?
   a. Single
   b. In a committed relationship
   c. Living with someone
   d. Engaged
   e. Married
   f. Separated/Divorced

g. Widowed

8) Generally, over the past 3 months, what has been your relationship status?
   a. Single
   b. In a committed relationship
   c. Living with someone
   d. Engaged
   e. Married
   f. Separated/Divorced
   g. Widowed

9) Generally, regarding your sexual partners over the past 3 months, were they individuals you would consider?
   a. Someone you just met
   b. Casual acquaintances
   c. Friends/Dates
   d. Close Friends
   e. Serious Dating Partners
   f. Boy/Girlfriends
   g. Spouse/Fiancé

APPENDIX B

DAILY DRINKING QUESTIONNAIRE

ALCOHOL USE

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							

1. Over the past 3 months, on average, how many standard alcoholic drinks you have had in a week?

   _____ Drinks/week

2. Over the PAST 30 days, on how many days did you consume any alcohol?

   _____ days in past month

3. Over the PAST 30 days, how many times have you had *four or more* drinks (if you are a female) or *five or more* drinks (if you are a male) in a single sitting?

   _____ times in past month

4. At what age did you FIRST DRINK alcohol? _____

5. At what age did you FIRST get DRUNK on alcohol? _____

6. At what age did you begin regularly drinking alcohol (at least one drink per month)? If you have never been a regular drinker, please place an X in the blank. _____

APPENDIX C

SPECIFIC SEX-RELATED ALCOHOL EXPECTANCIES SCALE (SSRAES)

Many people believe that alcohol can influence how they feel and act sexually. We would like to know how to know you think having a few drinks of alcohol affects your sexual feelings and behavior. Please answer the following questions based on level of agreement with 1 being strongly disagree to 6 being strongly agree.
After a few drinks of alcohol:

1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree

1. I feel closer to a sexual partner. _____
2. I am more sexual responsive. _____
3. I am less nervous about sex. _____
4. I enjoy sex more than usual. _____
5. I am a better lover. _____
6. I am less likely to use birth control. _____
7. I am less likely to take precaution before having sex. _____
8. I am less likely to talk with a new sexual partner about whether he has a sexually transmitted disease, like HIV or gonorrhea. _____
9. I am less likely (to ask a partner) to use a condom. _____
10. I have sex with people whom I wouldn't have sex with if I were sober. _____
11. I am more likely to do sexual things that I wouldn't do when sober. _____
12. I find it harder to say no to sexual advances. _____
13. I am more likely to have sex on a first date. _____

APPENDIX D

CONDOM AVOIDANCE MEASURE (TPB FACTORS)

Instructions:
Sometimes individuals try to avoid using condoms with their sex partners, even though their sex partner may request that they use a condom. We would like to know what your thoughts are about trying to avoid using condoms with your sex partners over the next 3 months.

Condom Use Avoidance Intentions
For the next set of questions, imagine a situation in which your partner wanted to use a condom and you didn't. If this happened to you in the next 3 months...

ICAL2 …how likely would you be to try to avoid using a condom?

1----------2----------3----------4----------5----------6----------7	999
Very unlikely 50/50 Very likely	No answer

ICAS1 …how strong would your intention be to try to avoid using a condom?

1----------2----------3----------4----------5----------6----------7	999
Not at all strong 50/50 Very strong	No answer

ICAP1 …how probable would it be that you would try to avoid using a condom?

1----------2----------3----------4----------5----------6----------7	999
Not at all probable 50/50 Very probable	No answer

****
Attitudes towards avoiding condom use
During the next 3 months, trying to avoid using condoms with a sex partner who wants to use one would be

	1----------2----------3----------4----------5----------6----------7			999
ATTCONA1	Bad	Neutral	Good	No answer
ATTCONA3	Awful	Neutral	Nice	No answer
ATTCONA2	Harmful	Neutral	Helpful	No answer
ATTCONA5	Foolish	Neutral	Wise	No answer
ATTCONA8	Unpleasant	Neutral	Pleasant	No answer

****

Perceived social norms for avoiding condom use
Even if you don't care what other people think you should do, they may have opinions. Please answer the next questions about what others think about you trying to avoid using condoms, even if you don't care what they think.

Most people who are important to me think that when my sex partners want to use a condom I…

PSNA1 1----------2----------3----------4----------5----------6----------7----------	999
Definitely should NOT Neutral Definitely SHOULD	No answer

……try to avoid using condoms in the next 3 months.

How do you think important people in your life would feel about you trying to avoid using a condom with a sex partner who wants to use one?

PSNA2 1----------2----------3----------4----------5----------6----------7 999
Feel I OUGHT NOT TO — Neutral — Feel I OUGHT TO — No answer

……try to avoid using condoms in the next 3 months.

Do people in your life support or oppose you trying to avoid condom use with a sex partner who wants to use one?

PSNA3 1----------2----------3----------4----------5----------6----------7 999
They strongly OPPOSE — Neutral — They strongly SUPPORT — No answer

….my trying to avoiding using condoms in the next 3 months.

****

<u>Perceived Behavioral Control for avoiding condom use</u>

Suppose your partner wanted to use a condom and you didn't want to use a condom.

In the next 3 months…
How much control do you have over whether you will try to avoid using condoms with your sex partner(s)?

PBCA1 1----------2----------3----------4----------5----------6----------7 999
No control — Neutral — Complete control — No answer

In the next 3 months…
I am in complete control over whether I will try to avoid using condoms with my sex partner(s) .

PBCA2 1----------2----------3----------4----------5----------6----------7 999
Completely false — Neutral — Completely true — No answer

In the next 3 months…
Whether or not I try to avoid using condoms with my sex partner(s) is entirely up to me.

PBCA3 1----------2----------3----------4----------5----------6----------7 999
Completely false — Neutral — Completely true — No answer

****

In the next 3 months….
For me to try to avoid using condoms with my sex partner(s)will be

PBCA5 1----------2----------3----------4----------5----------6----------7 999
Very difficult — Neutral — Very easy — No answer

In the next 3 months…
If I wanted to, it would be easy for me to try to avoid using condoms with my sex partner(s) .

PBCA6 1----------2----------3----------4----------5----------6----------7 999
Strongly disagree — Neutral — Strongly agree — No answer

In the next 3 months…
I have the ability to try to avoid using condoms with my sex partner(s).

PBCA7 1----------2----------3----------4----------5----------6----------7 999
Strongly disagree Neutral Strongly agree No answer

****

In the next 3 months, if you did not want to use a condom but your partner wanted to use one, how likely is it that you could try to avoid using a condom

STCA1_1	If condoms were handy when we had sex
STCA1_7	If you were drunk or high
STCA1_9	If your sex partner was drunk or high
STCA1_2	If sex was unexpected or spur of the moment
STCA1_4	If your partner directly requests that you use a condom
STCA1_3	If your partner gives you a specific reason (e.g. pregnancy, STD's) for wanting to use a condom

1----------2----------3----------4----------5----------6----------7 999
Very unlikely 50/50 Very likely No answer

****

<u>Outcome beliefs for avoiding condom use</u>

In the next 3 months, trying to avoid using condoms with a sex partner who wants to use one will:

OUTB2_1	Make my partner agree to have sex without a condom
OUTB2_3	Make my partner angry
OUTB2_4	Make my partner think I want a more serious relationship with her
OUTB2_5	Cause a fight or argument
OUTB2_6	Make my partner feel afraid
OUTB2_7	Give me something to brag about to my friends
OUTB2_8	Make me feel regretful afterwards

1----------2----------3----------4----------5----------6----------7 999
Very unlikely 50/50 Very likely No answer

****

APPENDIX E

CONDOM USE ITEMS

Instructions:

Please think about your penetrative sexual behavior over the **PAST 3 MONTHS**. By penetrative sexual behavior we mean, sexual intercourse involving vaginal or anal penetration by the penis. Additionally, condom use refers to the use of male condoms only. Please answer the following questions based on the frequency of your behavior with 1 being never to 7 being always.

1 = Never
2 = Rarely
3 = Sometimes
4 = About half the time
5 = Often
6 = Frequently
7 = Always

1. How often have you used a condom when you had penetrative sexual intercourse WHEN SOBER with ANY PARTNER of the opposite sex? _____
2. How often have you used a condom when you had penetrative sexual intercourse AFTER DRINKING ALCOHOL with ANY PARTNER of the opposite sex? _____

APPENDIX F

SEXUAL BEHAVIOR ITEMS

Instructions:

Please think about your previous penetrative sexual behavior. By penetrative sexual behavior we mean, sexual intercourse involving vaginal or anal penetration by the penis. Please answer the following questions to the best of your ability.

1. Have you had penetrative (i.e., vaginal or anal) sex in the **PAST YEAR**?
   Yes _____
   No _____

2. Have you had penetrative (i.e., vaginal or anal) sex in the **PAST 3 MONTHS**?
   Yes _____
   No _____

   2a. If you answered YES to Question 2, how many male/female sexual partners have you had penetrative sexual intercourse with in the **PAST 3 MONTHS**? _____

   2b. If you answered YES to Question 2, how many times in the **PAST 3 MONTHS** have you had penetrative sexual intercourse with a male/female sexual partner? _____

3. Have you or your partner been on any other forms of birth control during penetrative sexual intercourse over the **PAST 3 MONTHS**?
   Yes _____
   No _____

   3a. If you answered YES to Question 3, please specify

_____

VITA

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Education and Training

M.S. **Old Dominion University,** *Norfolk, VA*
Psychology, 2019 (Expected)
Advisor: Cathy Lau-Barraco, Ph.D.

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Background

Caitlin B. Turner is a second year graduate student at Old Dominion University. She is pursuing her Master's degree in Psychology. For the past year, she has contributed to projects for Dr. Cathy Lau-Barraco and served as the research participation advisor for the psychology department. Her research interests include alcohol-related risky sexual behavior and understanding the cognitive factors related to risky health behaviors.

Selected Presentations

Turner, C., Stamates, A., Cox, S., & Lau-Barraco, C. (2019, May). *Sex-related Molly expectancies of male and female Molly users.* Posted Presented at the Virginia Academy of Science Annual Meeting, Norfolk, VA.

Marczinski, C.A., **Turner, C.,** Baltes Thompson, E., & Mearns, C. (2017, April). *Acute Effects of Alcohol mixed with Energy Drinks versus Alcohol Alone on Balance and Aggression*. Poster Presented at the National Conference of Undergraduate Research (NCUR), Memphis, TN.

Marczinski, C.A., **Turner, C.,** Baltes Thompson, E., & Mearns, C. (2016, November). *Alcohol Consumption in College Students and the Use of Social Media*. Poster Presented at the Kentucky Academy of Science Annual Meeting, Louisville, KY.

Marczinski, C.A., **Turner, C.,** & Baltes Thompson, E. (2016, August) *Ad lib consumption of alcohol by social drinking college students is increased with energy drinks*. Poster Presented at the American Psychological Association Annual Convention, Denver, CO.