

ABSTRACT

Title of Dissertation: ASSESSING UNDERGRADUATE
STUDENTS' JUDGEMENT OF SEXUAL
ACTIVITY CONSENT SEEKING AND
COERCIVE BEHAVIORS, AND ATTITUDE
TOWARD ESTABLISHING SEXUAL
CONSENT

Israel Abebe, Doctor of Philosophy, 2022

Dissertation directed by: Dr. Donna Howard, Behavioral and Community
Health

Sexual violence continues to be a serious public health problem, particularly among the college student population. This dissertation developed and implemented a web-based factorial vignette experiment to investigate vignette- and respondent-level factors that can explain undergraduate students' evaluation of consent-seeking and verbal coercion in hypothetical vignette scenarios (N=420; Study 1). The vignettes embedded three factors with two levels each: level of intoxication (2 levels – sober/drunk), type of sexual relationship (2 levels – casual/committed), and, place of sexual encounter (2 levels – sexual initiator's/partner's residence). The respondent-level factors included gender identity, history of sexual victimization, attitude toward establishing consent, and endorsement of alcohol-involved consent scripts. Mixed models were used to assess the effects of vignette-level and respondent-level factors on students' evaluations of consent-seeking and verbally coercive behaviors. The results showed significant differences in students' evaluation of whether consent was sought based on level of

intoxication, type of relationship, vignette scenarios, gender, consent attitude and endorsement of consent scripts. In addition, the study found significant differences in evaluations of coercive behaviors based on the vignette scenarios, consent attitude and acceptance of consent scripts. The dissertation also assessed the relationship between students' endorsement of alcohol-involved sexual consent scripts and attitude toward establishing sexual consent, after accounting for covariates (Study 2). Hierarchical regression was used for this purpose. The study demonstrated that there is an inverse relationship between endorsement of consent scripts and consent attitude, after controlling for gender identity, relationship status, and campus athletic participation. There were also significant differences in consent attitude based on gender and relationship status. The findings from this dissertation emphasize the importance unpacking the elements of sexual consent definitions provided in many campus policies and understanding the cognitive and contextual factors that influence students' interpretations of those elements. In addition, the findings support that there are broader issues such as acceptance of scripts that influence students' consent attitudes. The implications include the need to target contextually relevant predictors of consent understanding and consent attitude in campus sexual violence prevention efforts.

ASSESSING UNDERGRADUATE STUDENTS' JUDGEMENT OF SEXUAL ACTIVITY
CONSENT SEEKING AND COERCIVE BEHAVIORS, AND ATTITUDE TOWARD
ESTABLISHING SEXUAL CONSENT

by

Israel Abebe

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Advisory Committee:

Associate Professor, Donna Howard, Chair

Assistant Professor, Elizabeth Aparicio

Associate Professor, Peter Steiner

Assistant Research Professor, Kirsten Stoebenau

Professor, Min Qi Wang

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Chapter 1: Overview

1.1. Background and Problem Statement

Sexual violence is a pervasive public health problem with significant immediate and long-lasting consequences to well-being. Sexual violence is an umbrella term that encompasses attempted and completed rape, sexual assault, and sexual harassment [Centers for Disease Control and Prevention (CDC), 2016; National Institute of Justice (NIJ), 2017]. The 2010 National Intimate Partner and Sexual Violence Survey (NISVS) found that 19.3% of women and 1.7% of men have experienced rape during their lifetimes, and 43.9% of women and 23.4% of men have experienced other types of sexual violence during their lifetimes (Breiding et al., 2014).

A population that experiences the highest rates of sexual victimization is college age groups, particularly females age 18-24 (CDC, 2014; Sinozich et al., 2014). While different forms of sexual victimizations have different lifetime prevalence rates, studies have shown that 15.5% to 38% of female college students experienced at least one form of sexual violence since starting college (Cantor et al., 2015; Carey et al., 2015; Fisher et al., 1999; Flack et al., 2007; Krebs et al., 2007; Mellins et al., 2017; Nasta et al., 2005). According to Mellins et al. (2017), about 12.5% male students also reported experiencing at least one incident of sexual violence. Males offending against females is the most common sexual violence incident among students (Kilmartin & Berkowitz, 2005, p. 52). In addition, sexual coercion is commonly reported by college students (Fedina et al., 2018; Struckman-

Johnson et al., 2003) and verbal coercion (e.g., arguments after sexual partner declines advance) is among the most common forms of sexual coercion (Struckman-Johnson et al., 2003).

Sexual violence victimization leads to a host of health consequences. Sexual violence victims are more likely to experience adverse health outcomes such as disengagement from regular activities, poor physical health (Black et al., 2011), poorer self-rated health (Plichta, 1996; Plichta & Falik, 2001), anxiety, depression (Burnam et al., 1988; Carey, Norris et al., 2018), post-traumatic stress disorder (Jina & Thomas, 2013; Sabina & Straus, 2008), and higher substance use following victimization (Angelone et al., 2017; Burnam et al., 1988; Kaysen et al., 2006). Sexual victimization has also been linked to lower academic performance (Jordan et al., 2014; Cecilia & Beverly, 2016). The extent of these adverse outcomes may differ by type of victimization, and severity may vary if adequate support/services are not made available to the victims (Holland & Cortina, 2017).

To address campus sexual violence, many institutions of higher education have adopted sexual misconduct policies and started implementing prevention programs with sexual consent taking a crucial role (Fenner, 2018; Jozkowski, 2015). Whether an explicit definition of what is known as affirmative consent is adopted (e.g., UVA/University of Virginia Policy of Sexual and Gender-based Harassment and Other forms of Interpersonal Violence, 2015) or not (e.g., UMD/University of Maryland Office of Civil Rights and Sexual Misconduct, 2016), there are common themes regarding how sexual consent is addressed in campus policies – e.g., establishing consent is the responsibility of the initiator and should be free of any

form of coercion. This dissertation specifically focused on these two themes embedded in many campus policies, and assessed college students' evaluation of sexual initiator's responsibility in consent seeking and the presence of coercion in hypothetical narrative scenarios (vignettes).

1.2. Understanding of Sexual Consent

The existing evidence suggests that undergraduate students' beliefs about what constitutes consent may depend on a number of contextual factors. For example, in dating scenarios, who initiated the date and what kind of activity was involved during the date (Muehlenhard et al., 1985) or who paid for date expenses (Pinciaro & Jessell, 1998) seem to create differing views as to whether a sexual activity is consensual.

A more recent qualitative study found that elements of affirmative consent such as consent seeking are understood by students (Curtis & Burnett, 2017). However, the students shared that explicit consent seeking can be "awkward" and may not be realistic (Curtis & Burnett, 2017). Another factor that may be a barrier to practicing affirmative consent standards is alcohol consumption. In Curtis & Burnett's study (2017), college students stated that affirmative consent may not be practiced frequently as many engage in sexual activities while intoxicated (Curtis & Burnett, 2017). The length of a relationship also seems to influence the level of perceived need for consent seeking (Humphreys, 2007).

While these studies have made significant contributions to the literature on students' understanding and views on consent broadly, there is still lack of robust empirical evidence that unpacks and documents students' interpretations of the

standards of consent outlined in many campus policies (e.g., consent seeking by the sexual initiator, absence of coercion – UVA, UMD). The literature is also limited on the nuances of what combination of factors (interactions) influence students' judgment of coercive-free consent seeking.

1.3. Focus of Dissertation

Given the above gaps in the literature, **Study 1** of this dissertation employed a factorial survey experiment to assess college students' evaluation of consent seeking behaviors of the sexual initiator and judgement of the presence of verbal coercion. The specific **research questions for Study 1** were: Are there relationships between level of intoxication, type of relationship, and place of sexual encounter (vignette-level independent variables) described in vignette narratives and students' evaluations of consent and verbal coercion? Are there interactive effects of the independent variables on students' evaluations? And what are the effects of respondent-level variables (gender, endorsement of alcohol-involved consent myths, attitude towards consent, history of sexual victimization) on students' evaluations?

The research activities of **Study 1** entailed: **a)** developing narrative vignettes describing intimate, sexual scenarios between two college students, and specifying vignette factors (i.e., independent variables to be embedded in the vignettes), factor levels (the values that the factors take; Rossi & Anderson, 1982) and vignette items (questions/statements to be presented after each vignette to assess students' evaluations of consent seeking behaviors and the presence of coercion in the scenarios); **b)** setting up an efficient experimental design, and implementing a web-based vignette experiment with undergraduate students; and **c)** testing how the factors

and combinations of factors and covariates relate to students' assessment of the sexual initiator's responsibility to seek consent and the presence of coercion in the vignette scenarios. The primary outcomes of interest were students' evaluations of consent seeking behaviors and the use of verbal coercive tactics. [Note: In this dissertation, the term "Consent seeking behaviors" refers to behaviors meant to establish consent prior to the initiation of sexual activity by the person who made a particular sexual advance.] These outcomes correspond to two of the standards of consent included in many campus sexual misconduct prevention policies (whether the policy provides an explicit definition of affirmative consent or not) – i.e., the person initiating the sexual activity has the responsibility to seek consent and consent should be obtained free of any form of coercion (e.g., UMD, UVA).

The purpose of **Study 1** was to contribute to the literature on college students' evaluation of specific elements of consent/affirmative consent (i.e., pertaining to initiator's consent seeking, and obtaining consent free of coercion), and to create a better understanding of the potential predictors. The findings can inform campus consent trainings and other sexual violence prevention programs. The innovative experimental approach of this dissertation also furthers the methodological literature.

In **Study 2**, the focus was on examining social and cultural factors relevant to understanding the context in which sexual violence occurs. Unpacking and understanding the context in which sexual violence occurs is needed in order to shift attitudes and perpetration behaviors (e.g., Jozkowski et al., 2015; Lonsway et al., 1998). Despite the heavy drinking culture (Lipari & Jean-Francois, 2016) and acceptance of traditional scripts (e.g., rape myths; McMahon, 2010) among students,

there is lack of research on the influence of cognitive contexts related to alcohol and consent myths on consent attitudes. **Study 2** sought to address this gap in the literature using data from Study 1. The **research question for Study 2** was: How do college students' adherence to alcohol-involved consent scripts influence their attitudes towards establishing sexual consent? In this study, alcohol-involved consent scripts included beliefs that conflate drinking with consent or that a drunk person can still give consent, as measured by Campus Beliefs and Myths scale (Ward et al., 2012).

1.4. Brief Introduction to Approach

This dissertation consisted of the design and implementation of a factorial vignette experiment (Rossi & Anderson, 1982) in Qualtrics. The vignettes were developed as brief narratives describing fictitious intimate encounters between 2 college students where consent seeking behaviors and the presence of coercion are ambiguous. The major research activities on developing and administering the vignette experiment are summarized as follows.

a. Developing vignettes and specifying vignette factors

Three brief vignette scenarios describing sexual encounter were generated using previous vignette-based studies that examined college students' perceptions of sexual consent (e.g., Hickman and Muehlenhard 1999, Humphreys, 2007) and their interpretations of rape cases (Deming et al., 2013) as the basis. The three scenarios specifically included verbally coercive behaviors, and the consent seeking behaviors of the sexual initiator were given as verbal or nonverbal. In addition, the two

characters in each scenario were given gender-neutral names. This is done in order to assess students' evaluation of coercive and consent seeking behaviors specifically when the gender of the individuals involved is not clear. Lastly, having three scenarios describing similar events differently offered variety; this was helpful to keep research participants engaged as they evaluated multiple vignettes. A series of items/statements were also developed for each scenario pertaining to coercion and consent seeking behaviors.

The vignette factors (categorical independent variables) and their levels were determined based on their importance in understanding coercion and consent seeking as discussed above. The factors are: degree of intoxication, type of sexual relationship, and place of intimate encounter. Each factor has 2 levels (Table 1). The 2 levels for intoxication are: sober and drunk. The levels for type of relationship are committed romantic relationship [i.e., an exclusive sexual and romantic relationship (Banker et al., 2010)], and casual [i.e., uncommitted sexual dynamic without emotional involvement (Garcia et al., 2012; Paul et al., 2000)]. Place of encounter also has 2 levels: initiator's place and partner's place.

Table 1. Vignette factors and the respective levels

Factors	Levels	
Level of intoxication	2 levels	Sober / drunk
Type of relationship ¹	2 levels	Committed / casual
Place of sexual encounter	2 levels	Initiator's place / partner's place

¹ There is lack of consensus around the interpretations of the different types of relationships (Howard et al., 2015). For the purpose of this dissertation, the following definitions are adopted for casual and committed dating relationships based on the literature. Casual refers to a sexual dynamic without emotional involvement or a commitment to one another (Garcia et al., 2012; Paul et al., 2000), and committed indicates an exclusive sexual and romantic relationship (Banker, Kaestle & Allen, 2010). Shortened definitions of these terms were incorporated into the vignettes so that the interpretations of the terms are consistent and as intended.

Vignette scenarios²

- 1) Austen and Dakota are college students who (*have been going out together without any expectation of commitment*). Last week, they were hanging out and having drinks at (*Austen's apartment*). They both were (*drunk*) when Austen leaned in and kissed Dakota. Dakota did not feel like starting anything sexual and moved away in hesitation. Austen proceeded to repeatedly accuse Dakota of leading them on. In the end, they ended up having sex.
- 2) It has been a few months since two undergraduate students, Emory and Berkley, started (*a committed, exclusive relationship*). A couple of weeks ago, they spent the day at (*Berkley's apartment*) watching movies and having drinks. They both were (*drunk*). At one point, while they were sitting on the couch, Berkley moved closer and put both arms around and kissed Emory. When Emory slowly pushed away Berkley's arms and continued watching the movie, Berkley repeatedly questioned why they were together. Emory explained that they just wanted to watch the movie and are not interested in having sex, but Berkley was not pleased. In the end, they ended up having sex.
- 3) Blair and Jamie have been (*in a committed, exclusive relationship*) since starting college last semester. On weekends, they usually get together at Blair's or Jamie's apartment and order in food and watch shows. Last month, they were hanging out at (*Jamie's apartment*). They spent the day

² The words in italics and parenthesis represent one of the levels of a vignette factor.

watching shows and having drinks. They both were (*sober*). At one point, Jamie pulled Blair closer and put both arms around Blair. Jamie asked if Blair wanted to have sex, and Blair said no. Jamie was irritated and warned Blair that they could stop seeing each other. In the end, they ended up having sex.

After the vignette scenarios, vignette factors and items were drafted, two rounds of virtual cognitive interviews with six undergraduate students were conducted to assess whether the vignettes are understood as intended (Lavrakas, 2008) and to gain an understanding of students' interpretations of the vignettes and vignette items. For this purpose, interviewer-driven probing technique were used (Collins, 2003). The interview questions asked what the student thought the scenarios were about and if any part of the scenarios was difficult to understand. The cognitive interview guide is presented in Appendix A.

b. Setting up an efficient experimental design

The term “factorial vignettes” reflects that the full set of vignettes is obtained by using the complete factorial combination of all factors (i.e., independent variables) and their respective levels that will be varied and presented to respondents (Atzmueller & Steiner, 2010). Given the number of vignette factors and their respective levels, the factorial combination of the vignettes was $2 \times 2 \times 2 = 8$. With the 3 vignette scenarios, the total vignette population came up to 24. Twenty-four vignettes were too many to be evaluated by each respondent. Therefore, 4 subsets with 6 vignettes each were selected using a technique called D-efficiency (D-

optimal), which, compared to other designs such as random sampling, avoids confounding of effects of interest and achieve efficiency (i.e., obtaining the greatest amount of statistical information; Auspurg & Hinz, 2015; Su & Steiner, 2018). This method also allowed for a manageable and equal number of vignettes to be evaluated by students. The partitioning of the vignette population into 4 sets of 6 vignettes is presented in Appendix H; higher-order interaction terms were confounded with Set effects.

c. Implementing experiment in Qualtrics

Once the factorial survey experiment is created in Qualtrics, a small number of undergraduate students tested the survey to ensure there were no issues with the experimental design or the implementation in Qualtrics. The survey invite was then sent out to 8,565 male and 7,800 female undergraduate students.

1.5. Research Questions and Hypotheses

The research questions (RQ) guiding this dissertation research (Study 1 and 2) were:

1. What are the main and interactive effects of vignette variables (level of intoxication, type of relationship and place of encounter) on students' evaluation of consent seeking and coercive behaviors in vignette scenarios?
(Study 1)
2. How do respondent-level variables (gender, endorsement of alcohol myths, attitude towards establishing consent, history of sexual victimization) affect

evaluations of consent seeking and coercive behaviors in vignette scenarios?

(Study 1)

3. How do college students' adherence to alcohol-involved consent scripts influence their attitudes towards establishing sexual consent? (Study 2)

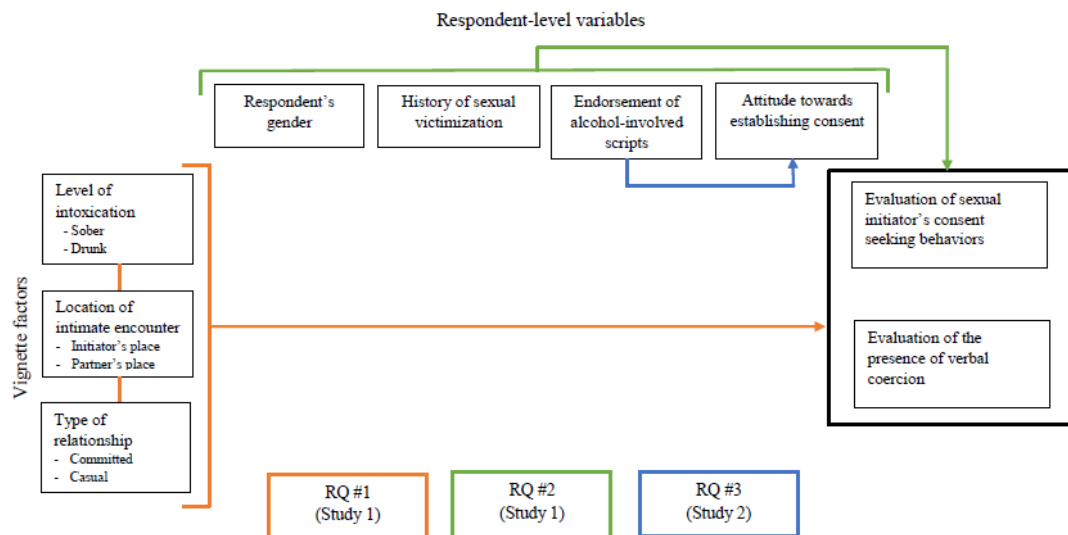


Figure 1. Conceptual Framework

The conceptual framework visually represents the research questions for both Study 1 and 2. In Study 1, it was hypothesized that the vignettes would be rated as more agreeable for the initiator's sexual consent-seeking behaviors and absence of coercion when the individuals in the scenarios are: a) sober, b) in a committed relationship, and c) the sexual encounter takes place at the initiator's residence, compared to when both are sober, are in a casual relationship and the encounter takes place at the partner's place of residence. In addition, it was hypothesized that the vignettes would be rated as less agreeable for the initiator's sexual consent-seeking

behaviors and absence of coercion by female students, students with lower acceptance of alcohol-involved consent scripts, and those with more positive attitude toward establishing consent. In Study 2, it was hypothesized that higher level of endorsement of consent scripts would be related to less positive attitude toward establishing sexual consent.

1.6. Rationale

Previous research primarily focused on how consent is expressed or communicated (e.g., Hickman & Muehlenhard, 1999), and less attention was given to the specific elements of consent. In line with two of the features of consent/affirmative consent definitions often included in campus sexual misconduct prevention policies – that the person initiating the sexual activity has the responsibility to seek consent and that consent should be obtained free of coercion (e.g., UMD, UVA), - **Study 1** sought to shed light on the predictors of students' evaluation of these consent standards in simulated narrative scenarios. Findings from **Study 1** can inform the focus areas for campus consent trainings and other sexual violence prevention programs.

In **Study 2**, the focus was on examining social and cultural factors relevant to understanding the context in which sexual violence occurs. Unpacking the context in which sexual violence occurs is needed in order to shift attitudes and perpetration behaviors (e.g., Jozkowski et al., 2015; Lonsway et al., 1998). Findings from **Study 2** expand the research literature by identifying the unique explanatory power of acceptance of alcohol-involved consent scripts in predicting students' consent attitudes. The findings also support the call by researchers for future campus sexual

violence prevention interventions to be inclusive of relevant contextual variables in their focus and content.

1.7. Dissertation Organization

This dissertation is organized as follows: Chapter 1 is introduction and overview of Study 1 and 2; Chapter 2 is detailed review of the literature; Chapter 3 is manuscript 1 from Study 1: Assessing undergraduate students' judgement of sexual activity consent seeking and coercive behaviors using a factorial vignette experiment; Chapter 4 is manuscript 2 from Study 2: Examination the relationship between alcohol-involved sexual consent scripts and consent attitudes among undergraduate students; and Chapter 5 is discussion of the findings and research and practical implications of both Study 1 and 2. Manuscript #1 will be submitted to Archives of Sexual Behavior, and manuscript #2 will be submitted to the American Journal of Sexuality Education.

The dissertation follows UMD's Electronic Thesis and Dissertation Style Guide (2021 edition) and use the American Psychological Association (APA) 7th edition citation format.

1.8. Definitions of Variables and Terms

Affirmative sexual consent: An excerpt from UVA's affirmative consent policy is presented here. "Affirmative Consent is informed (knowing), voluntary (freely given) and active (not passive), meaning that, through the demonstration of clear words or actions, a person has indicated permission to engage in mutually agreed-upon sexual activity. Affirmative Consent cannot be obtained by Force. Force includes a) the use

of physical violence, b) threats, c) intimidation, and/or d) coercion (University of Virginia Policy of Sexual and Gender-based Harassment and Other forms of Interpersonal Violence, 2015). UVA's policy also states "Affirmative Consent cannot be gained by taking advantage of the incapacitation of another, where the person initiating sexual activity knew or reasonably should have known that the other was incapacitated. UVA's guidance on Affirmative Consent states "a person who wants to engage in a specific sexual activity is responsible for obtaining Affirmative Consent for that activity."

Sexual consent: An excerpt from UMD's sexual misconduct policy is presented here. "Consent is a knowing, voluntary, and affirmatively communicated willingness to participate in a particular sexual activity or behavior. Only a person who has the ability and capacity to exercise free will and make a rational, reasonable judgement can give Consent. Consent may be expressed either by words and/or actions, as long as those words and/or actions create a mutually understandable agreement to engage in a specific sexual activity. It is the responsibility of the person who wants to engage in sexual activity to ensure that they have consent from the other party, and that the other party is capable of providing Consent" (University of Maryland Office of Civil Rights and Sexual Misconduct, 2016). UMD's policy also states that "Consent cannot be obtained by use of physical force, threats, intimidating behavior, or coercion."

Sexual coercion: Coercion is pressuring another person into sexual activity (University of Maryland Office of Civil Rights and Sexual Misconduct, 2016).

Sexual violence: Consistent with the use of the term by the CDC and NIJ, sexual violence is an umbrella term that includes rape, sexual assault, and sexual harassment (CDC, 2016; NIJ, 2017). The definitions for each of these terms are presented below.

Rape: The legal definition for rape has evolved over time, and varies by state (NIJ, 2017). Per NIJ’s definition, rape refers to “nonconsensual oral, anal, or vaginal penetration of the victim by body parts or objects using force, threats of bodily harm, or by taking advantage of a victim who is incapacitated or otherwise incapable of giving consent” (NIJ, 2017).

Sexual assault: Sexual assault is “a range of unwanted behaviors – up to but not including penetration – that are attempted or completed against a victim’s will or when a victim cannot consent” (NIJ, 2017). Sexual assault may involve “actual or threatened physical force, use of weapons, coercion, intimidation, or pressure, and may include intentional sexual touching, voyeurism, undesired exposure to pornography, and public display of images that were taken in a private context or when the victim was unaware” (NIJ, 2017).

Sexual harassment: Sexual harassment includes “degrading [sexual] remarks, gestures, and jokes, indecent exposure,” and unwanted advances such as touching, grabbing, pinching, or brushing against in a sexual way (NIJ, 2017).

Sexual victimization: Sexual victimization refers to experiences of sexual violence (rape, sexual assault, or sexual harassment).

Chapter 2: Literature Review

2.1. Prevalence of Sexual Violence – Historical Overview

The National Intimate Partner and Sexual Violence Survey (NISVS) from 2010 found that 19.3% of women and 1.7% of men have experienced rape during their lifetimes, and 43.9% of women and 23.4% of men have experienced other types of sexual violence during their lifetime (Breiding et al., 2014). According to the Office for Victims of Crime at the National Criminal Justice Reference Service (NCVRW), the prevalence rates of sexual victimization has not changed significantly between 2006 and 2015 (NCVRW Resource Guide: Sexual Violence Fact Sheet, 2018). Similarly, a report by the Bureau of Justice Statistics also indicated that there was no significant decline in prevalence between 1997 and 2013 (Sinozich et al., 2014). A cohort that experiences the highest rates of sexual victimization is college age groups, specifically females age 18-24 (CDC, 2014; Sinozich et al., 2014). Male violence against females is the most common type of sexual violence (Kilmartin & Berkowitz, 2005).

An earlier study by Koss et al. (1987) administered the Sexual Experiences Survey to a national sample of more than 6,000 students at institutions of higher education in the U.S. (2- and 4-year colleges and universities). The study found that 53% of female students reported experiencing some form of sexual victimization with 14.4% reporting unwanted sexual contact, 11.9% sexual coercion, 12.1% attempted rape, and 15.4% completed rape (Koss et al., 1987). According to this study, about 25% of male students indicated having been involved in some type of sexual aggression. These results, however, were not specific to victimization and

perpetration experiences *since* starting college. Nonetheless, this is one of the earlier studies that demonstrated the pervasiveness and urgency of sexual victimization among college-age females.

In 1999, Fisher et al. interviewed 4,446 female college students at 233 2- and 4-year institutions and measured 12 types of sexual victimization including completed and attempted rape, sexual coercion, and sexual contact with or without force or threat of force. This study also included stalking measures and sexual harassment measures pertaining to “visual victimization” (e.g., involuntary exposure to pornography, voyeurism) and “verbal victimization” (e.g., obscene telephone calls) (Fisher et al., 1999). The study specifically assessed experiences since the semester before the survey was conducted. The results indicated that 15.5% of female students experienced one form of victimization. About 2.8% experienced completed or attempted rape, of which 90% knew their attackers, and, for attacks that took place on campus, almost 60% of the incidents occurred in the victim’s residence (Fisher et al., 1999). The majority of the students also reported “verbal victimization” which would fall under NIJ’s definition sexual harassment.

Another widely cited source is the Campus Sexual Assault (CSA) study by Krebs and colleagues (2007). The CSA study was conducted at two public universities through a web-based survey administered to random samples of 5,446 female and 1,375 male undergraduate students. The study collected data on sexual victimization experiences before as well as since entering college. The findings show that 13.7% of female students reported experiencing completed sexual assault and 7.2% reported experiencing attempted sexual assault since entering college. The study

also found that, since entering college, 3.4% of female students experienced rape that was physically forced and 8.5% experienced rape while incapacitated and unable to consent (Krebs et al., 2007). Of the 1,375 male students, 0.5% experienced forcible rape and 2% experienced incapacitated rape since entering college (Krebs et al., 2007). In a later study, Krebs and colleagues (2011) replicated their study at historically black colleges and universities (HBCUs) and found that 9.7% of undergraduate women experienced completed sexual assault since entering college, and that 3.8% and 4.5% experienced forced and incapacitated rape, respectively. The prevalence rates for forced rape found in the studies by Krebs et al. (2007; 2011) are similar to the finding of a study by Kilpatrick and colleagues (2007) that reported a 3.2% prevalence rate among female students (Kilpatrick et al., 2007).

A more recent study by Mellins et al. (2017) found that gender non-conforming students had the highest rates of sexual assault victimization (38%). It is important to note that, in this study, the definition of sexual assault included attempted or completed penetration and sexual touching. Twenty-eight percent female students and 12.5% male students also reported experiencing at least one incident of sexual assault (Mellins et al., 2017). Another study that looked at differences across gender identities reported that sexual victimization rates were higher among bisexual and lesbian women (24% and 17.9%, respectively) compared to heterosexual women (13.3%) (Martin et al., 2011).

As described above, the historical prevalence rates from different studies conducted over the past few decades reveal that the issue of campus sexual violence continues to persist. More recent prevalence estimates also remain similar to past

prevalence rates. A recent systematic review of campus sexual assault surveys administered between 2010 and 2016 found a prevalence rate of 20.4% among female undergraduate students and 4.9% among male students who participated in the surveys (Rosenberg et al., 2019). In sum, campus sexual violence has been and continues to be a significant public health crisis.

2.2. Prevalence of Sexual Coercion

An experience related to sexual violence that is most commonly reported is sexual coercion (Fedina et al., 2018; Struckman-Johnson et al., 2003). Sexual coercion is “obtaining sexual acts through verbal pressure or manipulation or through use of older age or positions of authority” (Strang et al., 2013). The most common forms of sexual coercion are verbal pressure (e.g., repeatedly asking, starting arguments) and tactics of sexual temptation (e.g., continuous touching or kissing) (Struckman-Johnson et al., 2003) after refusing a sexual advance. According to a recent systematic review, the prevalence of unwanted sexual experience resulting from verbal coercion ranged between 1.7% and 32% among college students (Fedina et al., 2018) while older studies reported 24% among male students and 35%-42% among female students (Lottes, 1991; O'Sullivan et al., 1998). The study by Struckman-Johnson et al. (2003) at two universities asked about experiences of being subjected to persistent attempts to engage in a sexual activity after having refused and found that 78% of women and 58% of men reported having experienced sexually coercive tactics since the age of 16. The same study also found that 40% of men and 26% of women have used sexual coercion after their partner refused. Fedina et al. (2018) point out that sexual coercion could occur in the context of “casual

encounters” or “hookups”, which are prevalent among the college population (Stinson, 2010). With the evidence suggesting that sexually coercive behaviors after non-consent are not uncommon on campuses, it is crucial to investigate students’ views of what coercion is.

2.3. Differences in Prevalence Estimates

With the studies discussed above, there are marked variations in prevalence estimates and the range of experiences reported. The variations in estimates could be due to differences in the scope and time frame of the survey, definitions of sexual violence, wording of survey questions, response options, and data collection methods (Sinozich et al., 2014). Many studies focus on more severe types of sexual victimization and not account for the full range of unconsented experiences including noncontact forms (Banyard et al., 2007). In terms of operational definitions of terms, different surveys draw from different perspectives (Sinozich et al., 2014). For instance, the National Crime Victimization Survey (NCVS) covers “threatened, attempted, and completed rape and sexual assault against males and females”, whereas the National Intimate Partner and Sexual Violence Survey (NISVS) specifically asks about incidents where the victim was unable to communicate consent because of alcohol or drug use, forced to penetrate another person, physically or non-physically coerced to engage in unwanted sexual contact or non-contact experiences (Sinozich et al., 2014). The Campus Sexual Assault Survey (CSA) does not include unwanted sexual contact due to verbal or emotional coercion (Sinozich et al., 2014). The format, wording and response options of the questions in these surveys can also be different. The data collection methods for NCVS is in-person and phone

interviews, NISVS uses random-digit dialing, and the CSA survey is self-administered (Sinozich et al., 2014) potentially contributing to differences in sexual victimization estimates. In addition, variation in estimates could be attributed to differences in study designs (cross-sectional vs. longitudinal), sample sizes, sampling strategies, and sample characteristics (Fedina et al., 2018).

Despite the inconsistencies across prevalence studies, the figures may actually be underestimated as disclosure rates are very low. Sinozich et al. (2014) found that only 20% of female rape victims report to the police. Another study found that even fewer made a report - 2.1% to the police and 4% to campus authorities (Fisher et al., 2003). The reasons for not reporting include belief that the matter was personal, fear of reprisal (Sinozich et al., 2014), self-blame or feeling of partial responsibility (Harned, 2005), fear of not being believed, and not knowing that they could report to campus authorities (Spencer et al., 2017). Another important issue when it comes to reporting is whether the person who experienced sexual violence labels it as such (Harned, 2005; Kahn, 1994). Women may not label sexual violence for many reasons including perceiving that their experience did not fit the description of a stereotypical sexual violence or conform with a “rape script” of a physically forcible act perpetrated by a stranger (Harned, 2005; Kahn, 1994). Even earlier definitions of rape at the federal government level made a reference to a specific gender and included force requirement until 2012, when the U.S. Attorney General removed these references from the definition of rape for the Uniform Crime Reports of the Federal Bureau of Investigation (Anderson, 2016; Department of Justice, 2012). In addition, women may not label sexual violence in an attempt to minimize their experience as

“not a big deal” that did not harm them seriously as a way to protect themselves from the psychological effects of acknowledging what happened (Harned, 2005). Some may also avoid labeling if they perceive the behavior as typical in dating relationships (Harned, 2005). Therefore, there are many reasons why people who experienced a form of sexual violence may not identify, seek support or services (Sabina & Ho, 2014), or report it, potentially contributing to underestimated prevalence rates. Reporting may be even lower for racial and ethnic minorities, LGBTQ individuals, and international students (Brubaker et al., 2017).

2.4. The Contexts of Campus Sexual Violence

For many, college is the first experience of living away from home, with greater independence and exposure to a new social environment, and, often, the timing coincides with students’ developmental transition into adulthood (Flack et al., 2008; Joseph et al., 2013; Muehlenhard et al., 2016). The typical college-age is considered a period during which exploration of gender and sexuality is typical for many (Lefkowitz & Gillen, 2006) and individuals get exposed to traditional gender stereotypes in new contexts (Maas, Shearer, Gillen, & Lefkowitz, 2015). In addition, college experience often includes socialization – a process through which students interact with others in ways and settings characterized by different social norms and expectations (Donnelly & Fraser, 1998). While college socialization itself can be viewed as a developmental experience, male-dominated party culture, access to alcohol, and gender-based sexual expectations can increase the risk for sexual victimization particularly for female students (Muehlenhard et al., 2016). The risks for victimization are even greater for students that are newer to campus (i.e.,

freshmen) than juniors and seniors (Krebs et al., 2007). In fact, some studies refer to the first few weeks of entering college during which students have greater vulnerability as “red zone” (Flack et al., 2008). In recognition of the “red zone”, some campuses readily avail specific information for their students about the heightened risk during the first few weeks [e.g., Indiana University of Pennsylvania (IUP) has a campaign called Turn the Red Zone Green, which runs from the start of the Fall semester through Thanksgiving recess] (IUP, n.d.). Furthermore, longitudinal studies support that first-semester students have higher risk than second-semester students (Jordan et al., 2014), and the risk becomes lower as students progress through the years (Humphrey and White, 2000).

Colleges and universities also provide an environment for students to explore social relationships including intimate or dating relationships. Research suggests that sexual violence among college students occurs frequently in the context of intimate relationships (e.g., Abbey et al., 1996), including casual sexual relationships (Fielder et al., 2014; Flack et al., 2007; Testa et al., 2010). For instance, a representative study by Flack et al. (2007) found that 77.8% of students who reported experiencing unwanted vaginal, anal, and/or oral intercourse indicated that the incident took place in the context of hooking up, which is prevalent among the college population (Stinson, 2010).

Studies have also shown the link between the drinking culture and sexual violence among college students (Kilpatrick et al., 2007; Krebs et al., 2007). Alcohol is the most widely consumed substance among college students (Lipari & Jean-Francois, 2016), with up to 40% of college students drinking heavily - five or more

drinks consecutively over a two-week period (O'malley & Johnston, 2002).

Substance-facilitated or -incapacitated³ sexual victimization is found to be higher among female college students than the general population (Kilpatrick et al., 2007).

In addition, studies have examined perceptions and attitudes of sexual violence among college students and their associations to violence. One factor that has been studied extensively and has been shown to perpetuate sexual violence is the acceptance of rape myths (Streng & Kamimura, 2017). Rape myths are false beliefs about rape and includes victim blaming (Streng & Kamimura, 2017). Examples of such myths include beliefs that perpetrators are often strangers to the victims (Kilmartin, & Berkowitz, 2005), and the notion that how a woman dresses can be used to trivialize sexual violence (Joseph et al., 2013). A study by McMahon (2010) showed that college students have moderate level of support for rape myths with myths related to “he didn’t mean to” and “she lied” receiving higher acceptance. This study also found evidence of victim blaming with more than half agreeing or strongly agreeing that “If a girl acts like a slut, she is eventually going to get into trouble.” In addition, male students, athletes and those with Greek affiliation were found to have higher level of rape myth acceptance. While McMahon (2010) describes the overall support for rape myths among students as “moderate”, the findings point to the social and cognitive environments that may be contributing to sexual violence.

The complex cognitive, peer norm and other cultural context in which sexual encounters occur among college students have implications for education and other

³ Substance-facilitated victimization refers to incidents where the victim is deliberately given alcohol or other substances, and substance-incapacitated victimization refers incidents that occur after the victim gets intoxicated of own will (Kilpatrick et al., 2007).

efforts directed at tackling sexual violence. It is important that prevention efforts be comprehensive enough to address these contextual factors.

2.5. Consequences of Sexual Violence

Sexual violence leads to extensive physical, psychological and social consequences, with sexual assault and rape being the most severe types. Sexual violence victims can develop post-traumatic stress disorder (Clum et al., 2000; Jina & Thomas, 2013; Sabina & Straus, 2008), and fear, anxiety and depression (Acierno et al., 2002; Burnam et al., 1988; Carey et al., 2018; Clum et al., 2000; Ullman & Siegel, 1993), and experience reduction in regular activities, difficulty with sleeping, chronic pain, poor physical health (Black et al., 2011), and report poorer self-rated overall health (Plichta, 1996; Plichta & Falik, 2001). Studies also found higher substance use following victimization (Angelone et al., 2017; Burnam et al., 1988; Kaysen et al., 2006). In addition, lower academic performance has also been associated with sexual victimization (Jordan et al., 2014; Cecilia & Beverly, 2016). These outcomes may worsen if adequate support and services are not provided to the victims (Holland & Cortina, 2017). The lifetime economic costs are estimated to be around \$3.1 trillion (Peterson et al., 2017).

2.6. Governmental and Institutional Efforts to Address Sexual Violence

2.6.1. Federal legislations

Institutional response to sexual violence has seen significant changes in the past few decades with the help of legislative reforms and efforts by students and

advocates. The passage of Title IX of the Educational Amendments (commonly referred to as Title IX) in 1972 served as one of the early impetuses (Department of Justice, n.d.). Under this law, educational institutions that receive funds from the federal government are prohibited from discriminating based on sex (Carney, 2018; DoJ, n.d.). Sexual violence is a form of sex discrimination prohibited by Title IX. Other important legislative milestones include The Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act of 1990 (The Clery Act) that required institutions receiving federal funds to report crime data annually including incidents of sexual violence, and the Campus Sexual Violence Elimination Act (Campus SaVE) that added reporting requirements on dating violence and domestic violence (Carney, 2018). The feminist movement, advocacy groups, and college students also played part in galvanizing support for protecting students against sexual violence (Anderson, 2016).

In 2011, additional procedural requirements for addressing campus sexual violence were announced by the Department of Education (DoE), Office of Civil Rights (OCR), through the *Dear Colleague Letter on Sexual Violence*, which required the designation of dedicated personnel to implement Title IX regulations, and establishment of grievance procedures (DoE OCR, 2011). In 2014, President Obama formed a White House Task Force To Protect Students From Sexual Assault that called for educational institutions to conduct campus climate surveys and put in place comprehensive sexual misconduct policy (DoJ, 2014). Accordingly, several institutions responded by creating Title IX offices on campus, developing policies, establishing incident reporting procedures (Holland & Cortina, 2017), offering sexual

misconduct trainings to campus community, and availing educational programs and events. In 2017, the federal guidance on combating campus sexual violence was rescinded (U.S. DoE, 2017a, 2017b). Similarly, the *Dear College Letter* and the guidelines that were laid out by the White House Task Force are both withdrawn by the DoE (Herres et al., 2018). In 2021, the federal government announced a new review of Title IX regulations (The New York Times, June 2021).

2.6.2. State laws and institutional policies – Sexual consent

Another important change in institutional response is the shift from “no means no” – the assumption that sexual consent is presumed unless a person indicates otherwise (Little, 2005) (Little, 2005) - to “yes means yes” (i.e., affirmative consent) (Haaken, 2017). With affirmative consent, consent is communicated clearly, the responsibility of obtaining consent is on the person initiating a sexual act (Little, 2005), consent must be on-going throughout a sexual encounter, and silence, lack of protest or resistant do not mean consent (California Legislative Information, SB-967 Student safety: Sexual assault). While the Office of Civil Rights, which oversees the enforcement of Title IX requirements, does not endorse a specific definition, many colleges and universities are showing commitment to uphold affirmative consent standards (Anderson, 2016). Currently, 10 U.S. Code § 920 Article 120 Rape and Sexual Assault Generally describes sexual consent as a “freely given agreement to the conduct at issue by a competent person” (Office of the Law Revision Counsel, The United States Code). States are also making legislative changes in favor of affirmative consent. For instance, California requires institutions of higher education to incorporate affirmative consent definitions in campus policies through a law passed

in 2014 (California Legislative Information, SB-967 Student safety: Sexual assault). Similarly, New York provides a state-wide definition of affirmative consent under the “Enough is Enough” law signed in July 2015 (New York Department of Health, 2018). Educational institutions in non-mandating states are also taking the initiative to explicitly define affirmative consent in campus sexual misconduct policies [e.g., University of Virginia (UVA Policy of Sexual and Gender-based Harassment and Other forms of Interpersonal Violence, 2015), while others put strong emphasis on consent in their policies. For instance, UMD defines sexual consent as “a knowing, voluntary, and affirmatively communicated willingness to participate in a particular sexual activity or behavior.....may be expressed by words and/or actions, as long as those words or actions create a mutually understandable agreement to engage in specific sexual activity” (UMD Office of Civil Rights and Sexual Misconduct, 2016). The UMD policy also states that “It is the responsibility of the person who wants to engage in sexual activity to ensure that they have consent from the other party, and that the other party is capable of providing consent.”

Before the support for affirmative consent gained traction, Antioch College in Yellow Springs, Ohio, was one of the first institutions to establish a formal Sexual Offenses Policy for its campus community more than two decades ago (Guskin, 1994). According to this policy, consent has to be obtained prior to engaging in any sexual activity, and for “each new level of physical and/or sexual behavior” suggesting that consent should be continuous throughout a sexual encounter (Antioch College, 1996). At the time, Antioch’s move was met with criticism from the media and campus community. Since then, and particularly over the last decade, there has

been a significant increase in the support for affirmative consent demonstrated in efforts by legislations, explicit definitions in campus sexual misconduct policies, and trainings and programs offered by colleges and universities as discussed above. Most recently, the “MeToo” and “Time’s Up” movements furthered the awareness about sexual violence in everyday life (Langone, 2018). While some institutions have not adopted affirmative consent in their campus policies, may have clear consent definition. In fact, over 90% of colleges and universities have published their policies online with about 88% providing sexual consent definitions (Graham et al., 2017). Many of the consent definitions cover topics similar to affirmative consent such as responsibility to seek consent, instances when one is unable to consent, communication of consent, expression of consent voluntarily, withdrawal of consent, and sexual coercion (Graham et al., 2017).

2.7. Sexual Consent from the Perspectives of College Students

2.7.1. Students’ understanding of consent

The existing evidence suggests that undergraduate students’ beliefs about what constitutes consent may depend on a number of factors. In an earlier study, Muehlenhard et al. (1985) investigated whether who initiated the date and what kind of activity is involved during the date affect how students view an incident of rape described in written scenarios (vignettes). The study found that scenarios where the woman was the one who initiates the date rather than the man, the pair goes to the man’s residence instead of attending a religious event, and the man pays for all expenses rather than the two sharing costs are evaluated as “more justifiable.”

Another older scenario-based study by Bostwick and Delucia (1992) found the person that initiated the date (male or female) and paid for all date expenses in a given scenario is evaluated as indicating highest willingness to engage in sex, and men's evaluations were consistently higher than women's. A study by Sawyer, Pinciaro & Jessell (1998) also documented that date rape scenarios that involved ambiguous consent communication received higher rape evaluations from female compared to male students. With regards to coercive behaviors, both male and female students were able to correctly identify the presence of coercion in the scenarios. However, for the scenarios that did not include an explicit "no" response to a sexual advance, students only gave moderate levels of rape evaluations (Sawyer et al., 1998). This may suggest that, when judging sexual violence, students may overlook the initiator's coercive behaviors and give more weight to whether the other person verbally said "no."

The scholarship specifically on affirmative consent or "yes means yes" is rather limited. A recent qualitative study with student leaders from student government bodies, Greek organizations, etc. found that elements of affirmative consent such as consent seeking are understood among the participants (Curtis & Burnett, 2017). However, the students felt that affirmative consent standards such as explicit consent seeking can be "awkward" and are not realistic (Curtis & Burnett, 2017). Being in a relationship also seems to influence the level of perceived need for consent seeking. A finding from a quantitative vignette-based study supports that length of a relationship is inversely related to explicit consent seeking (Humphreys, 2007). In another study, Beres (2014) conducted semi-structured interviews with

young adults (age 18-30) about sexual negotiation and found that many participants did not see consent-seeking as necessary in the context of their present relationships. Beres (2014) also found that even when the participants reported sexual negotiation with their partners (e.g., about sexual activities), they did not necessarily see that as being part of consent. Another factor that may be a barrier to practicing affirmative consent is alcohol. In Curtis & Burnett's study (2017), students stated that affirmative consent may not be practiced frequently as many students engage in sexual activities while intoxicated (Curtis & Burnett, 2017). No previous study, however, examined the potential interaction effects of multiple factors on students' evaluation of consent and coercive behaviors.

2.7.2. Students' consent/non-consent practices

Studies show that there are nuances to college students' views on what behaviors constitute consent. For instance, not resisting a partner's sexual advance is one of the most commonly reported ways of signaling consent; however, being completely passive is viewed as non-consent (Jozkowski, Sanders, Peterson, Dennis & Reece, 2014). There are also important differences in how consent is communicated. Earlier studies had reported that students tend to express sexual consent nonverbally (e.g., engaging in sexual touching) (Hall, 1998; Hickman & Muehlenhard, 1999), whereas a more recent study found they tend to consent verbally (Jozkowski, 2011). Looking at the differences between men and women, Jozkowski (2011) found that men tend to express consent nonverbally and women verbally. This finding appears consistent with gendered sexual roles and expectations where men initiate sexual activity and women decide whether the sexual activity will occur

(Jozkowski & Peterson, 2013; Wiederman, 2005). The nature of consent communication could also depend on the type of sexual activity. Hall (1998) found that sexual activities such as penile-vaginal intercourse, oral and anal sex are more likely to involve verbal consent than kissing and sexual touching. Getting consent is also considered more important in casual sexual encounters than in longer term relationships (Beres, 2014). In terms of how often consent is to be established, findings from semi-structured interviews with young adults age 18-30 showed that consent was viewed as a single expression indicative of sexual interest rather than an on-going “check-in” specific to different sexual activities (Beres, 2014).

Gender differences also emerge in attributions of consent. Humphreys (2007) tested narrative vignettes of sexual encounters with undergraduate students. The vignette portrayed a male and female couple on a date, where the male initiates a sexual activity and the female’s consent remains ambiguous. The study found that male students were more likely than female students to judge the encounters described in the vignettes as consensual.

2.8. Gaps in the Literature

Sexual violence among college students is a persistent public health crisis. The prevalence rates have remained alarmingly high over the last few decades and the rates have not declined despite increased legislative efforts (e.g., at the federal and state levels), institutional responses (e.g., adoption of campus policies and response procedures) and engagement of activists.

Past research with college students identified interesting differences in: understanding of consent, consent communication practices, evaluation of consent,

and when and how frequently consent is perceived to be needed from the perspective of students. What appears to be missing in the literature is a systematic investigation of students' understanding of the specific elements of consent as described in campus policies. Whether an obvious definition of affirmative consent is adopted in the policies (e.g., UVA) or a strong emphasis on consent is presented (e.g., UMD), there are common themes in how sexual consent is addressed in many campus policies today – e.g., the person initiating the sexual activity has the responsibility to seek consent, and consent should be obtained free of coercion. In addition, the research on sexual coercion seems to be siloed from the research on consent. To address these gaps, **Study 1** of this dissertation focused on students' evaluation of consent seeking and coercive behaviors and examined the effects of potential predictors using a carefully developed and implemented factorial vignette experiment. The manuscript related to Study 1 is presented in Chapter 3.

Study 2 of this dissertation focused on a contextual factor that could help expand our understanding of students' sexual consent attitudes. Researchers have called for the need to bring attention to the cognitive and cultural contexts in which sexual violence occurs (e.g., Jozkowski et al., 2015; Lonsway et al., 1998). Shifting attitudes and behaviors may require understanding the contextual factors (e.g., heavy drinking culture among students; Lipari & Jean-Francois, 2016; acceptance of traditional scripts such as rape myths; McMahon, 2010). As such, Study 2 assessed the relationship between students' adherence to alcohol-involved consent scripts and their attitudes towards establishing sexual consent. In this study, alcohol-involved consent scripts included beliefs that conflate drinking with consent or that a drunk

person can still give consent, as measured by Campus Beliefs and Myths scale (Ward et al., 2012). The manuscript related to Study 2 is presented in Chapter 4.

Chapter 3: Assessing undergraduate students' judgement of sexual consent seeking and coercive behaviors using a factorial vignette experiment

Abstract

The promotion of educational initiatives around sexual consent on college and university campuses is one approach being used to curb the prevalence of sexual violence. In the sexual consent literature, however, the evidence base for robust, experimental approaches to understanding undergraduate students' views of consent is still underdeveloped. This study designed and implemented a web-based factorial survey experiment to examine students' evaluations of consent seeking and verbally coercive behaviors in hypothetical vignette scenarios describing sexual encounters. The study included vignette-level factors (level of intoxication, type of relationship, place of encounter) and respondent-level factors (gender, attitude toward establishing consent, endorsement of alcohol myths, history of victimization) and used multilevel models to assess predictive effects. The study took place at a large mid-Atlantic public university, and data collection took place between October and December of 2021 (N=420). The results showed that level of intoxication and type of relationship predicted students' interpretations of consent-seeking behaviors. Vignettes describing verbal consent-seeking also received higher endorsement for consent-seeking behaviors. In addition, there were differences in assessment of consent-seeking and coercive behaviors based on students' acceptance of consent scripts and attitude towards establishing consent. The findings have implications for campus sexual violence prevention efforts to incorporate specific discussions around how different contextual factors may shape students' views of sexual consent and coercion.

Keywords: Factorial vignette experiment, sexual consent-seeking, verbal coercion, undergraduate students

Introduction

Sexual violence is broadly defined as “sexual activity where consent is not obtained or freely given” (Centers for Disease Control and Prevention; CDC, 2022). Sexual violence is a prevalent issue faced by undergraduate students, with 11.7% reporting victimization since starting college/university (the estimate for female students is 23.1% and for male students 5.4%; Cantor et al., 2015). Sexual coercion (“obtaining sexual acts through verbal pressure or manipulation or through use of older age or positions of authority;” Strang et al., 2013) is one of the most commonly reported incidents by college students (Fedina et al., 2018; Struckman-Johnson et al., 2003). In particular, verbal pressure after sexual advance is refused is a common form of sexual coercion (Struckman-Johnson et al., 2003).

One of the responses to campus sexual violence is the establishment of sexual violence handling procedures and adoption of campus sexual misconduct policies that clearly define sexual consent (Graham et al., 2017). Some institutions adopted what is known as “affirmative consent” that supports the practice of active, voluntary communication of permission (in words or action), that consent is ongoing during intimate activities, that a history of dating or sexual relationship, by itself, does not automatically constitute consent, that consent-seeking is necessary, and that it cannot be obtained by threats, intimidation or coercion (California Legislative Information, SB-967 Student safety: Sexual assault, 2014; The New York State Senate Legislation, Section 6441, Affirmative consent to sexual activity, 2017). Other institutions that do not mention “affirmative consent” in their policies still define consent in much of the same way, covering themes such as responsibility of consent-seeking, instances when

one is unable to consent, communication of consent, expression of consent voluntarily, withdrawal of consent, and sexual coercion (Graham et al., 2017). The institution where this study was conducted provides a definition for sexual consent that covers these themes and also explicitly states that establishing consent is the responsibility of the sexual initiator and consent-seeking should be free of any form of coercion.

Approximately 90% of sexual assaults against college women are committed by an individual that the victim knew, and about half of the incidents occur in the context of a date (Abbey, 2002). Researchers argue that understanding why campus sexual violence continues to be a persistent and prevalent issue requires understanding the social context in which it occurs (Hirsch & Khan, 2020). This perspective involves analyzing the multidimensional social “ecosystems” that perpetuate gender and power disparities and facilitate sexual violence perpetration (Hirsch & Khan, 2020). One example of a social context is endorsement of stereotypical gendered beliefs that underscore gender inequality and shape college students’ sexual lives, such as beliefs that sex is to be “won” by men and that women can be “convinced” to have sex even if they refused to a sexual advance (Jozkowski et al., 2017). Other examples that make up the social “ecosystems” include the type of relationship individuals share and the power dynamics within the relationship as well as control over the physical space (e.g., dorm room) in which the incident occurs (Hirsch & Khan, 2020). Physical space represents social power that can influence individuals’ sexual behaviors (Hirsch & Khan, 2020).

The literature on factors influencing students' perceptions about consent-seeking behaviors and verbal sexual coercion have also identified social contexts such as gender, relationship history or gendered beliefs about masculinity and femininity as potential predictors (Eaton & Matamala, 2014; Humphreys, 2007). For example, a vignette-based study with undergraduate students found that the length of a relationship is inversely related to perceived need for explicit consent seeking, and female students, compared to males, were more likely to interpret explicit consent as necessary in any kind of relationship (Humphreys, 2007). With respect to verbal coercion, the evidence shows that endorsement of stereotypical sexual beliefs (e.g., beliefs that men are the sexual initiators) is associated with perpetration among both college men and women (Eaton & Matamala, 2014).

Other past studies identified intrapersonal, interpersonal and contextual factors that can influence college students' interpretations of whether a sexual encounter is consensual or not. In assessing hypothetical date rape scenarios, students took into account factors such as gender of the person who initiated the date and spatial and other details of the date (Bostwick & Delucia, 1992; Muehlenhard et al., 1985). In a vignette-based study examining students' views on an incident of date rape where the victim was depicted as a woman (Muehlenhard et al., 1985), the hypothetical scenarios where: 1) the woman was the one who initiated the date rather than the man, 2) the pair went to the man's place of residence instead of attending a religious activity, and 3) the man paid for all expenses rather than the two sharing costs were evaluated as "more justifiable." In another study, Bostwick and Delucia (1992) found that the person who paid for all date expenses in a given scenario was

evaluated as indicating highest willingness to engage in sex, and men's evaluations were consistently higher than women's. More recent qualitative research has also found that college students perceive women who accept drink offers as having expressed consent to sex (Jozkowski et al., 2017; Jozkowski et al., 2018).

While past studies provided insight into students' experiences, understanding or interpretations of sexual consent, robust, experimental evidence is still lacking that investigates potential intrapersonal and contextual predictors. Thus, the present study used a factorial survey experiment to examine the predictive effects of alcohol, relationship type and spatial factors on students' interpretations of consent-seeking and coercive behaviors in hypothetical vignette scenarios where consent-seeking behaviors were ambiguous and verbally coercive tactics were present. This research specifically focused on students' interpretations of two consent concepts embedded in the campus policy where the study was conducted (namely, establishing consent is the responsibility of the party who wants to engage in sexual activity, and it should be free of coercion). The study also assessed the effects of individual-level factors such as gender, history of sexual victimization, attitude towards establishing consent, and endorsement of alcohol-involved consent myths (e.g., "When a person is drinking alcohol, the person is implying interest in engaging in sexual activity" as measured by the Campus Beliefs and Myths scale (Ward et al., 2012).

The primary research questions of the study were: 1) What are the main and interactive effects of vignette factors/variables (level of intoxication – drunk vs. sober; type of relationship – casual vs. committed; and place of sexual encounter – sexual initiator's vs. partner's) on students' evaluation of consent seeking and

coercive behaviors in vignette scenarios? 2) How do respondent-level variables (gender, endorsement of alcohol-involved consent myths, attitude towards establishing consent, history of sexual victimization) affect evaluations of consent seeking and coercive behaviors in vignette scenarios? It was hypothesized that coercive behaviors and lack of explicit consent seeking by the sexual initiator would be rated as more agreeable when the individuals in the vignettes scenarios are: a) both sober, b) in a committed relationship, and c) the encounter takes place at the initiator's residence, compared to when both are drunk, are in a casual relationship and the encounter takes place at the partner's place of residence. In addition, it was hypothesized that coercive behaviors and lack of explicit consent seeking by the sexual initiator would be rated as less agreeable by female students, students with lower acceptance of alcohol myths, and those with more positive attitude toward establishing consent.

The research entailed the following activities: **1)** developing narrative vignettes describing sexual scenarios between two college students, and specifying vignette factors (i.e., the independent variables to be embedded in the vignettes); factor levels (the values that the factors take; Rossi & Anderson, 1982); and, vignette items (questions/statements to be presented after each vignette to assess students' evaluations of consent seeking behaviors and coercion in the scenarios); **2)** setting up an efficient experimental design, and implementing a web-based vignette experiment with undergraduate students; and **3)** testing how the vignette factors and respondent-level variables influence students' assessment of consent-seeking and coercion in the vignettes. The research was conducted at a large mid-Atlantic university.

Experimental Vignette Design

a) Development of vignettes, and specification of vignette factors and levels

The vignettes were developed using recommended considerations such as rooting the vignettes in the literature, using a similar format for the vignettes throughout, and including ambiguous elements that will engage the participants (Evans, Roberts, Keeley et al., 2015). The vignette development process included the specific tasks discussed below.

a.1. First, three brief vignette scenarios were generated in a narrative form. Previous vignette studies that examined college students' perceptions of sexual consent (Humphreys, 2007) and interpretations of rape cases (Deming et al., 2013) provided the basis for this process. The vignettes portrayed sexual encounters between two college students where consent-seeking behaviors were ambiguous and verbal coercion was present. The vignette factors (independent variables), which were embedded in the stories, were determined based on their importance in understanding students' views of coercion and consent. They were: level of intoxication (2 levels – sober/drunk), type of sexual relationship (2 levels – casual/committed), and, place of intimate encounter (2 levels – sexual initiator's/partner's residence; Table 1). The number of levels, as described below, are specified as two to allow for more efficient samples of vignettes (Auspurg and Hinz, 2015).

Table 1. Vignette factors and factor levels

Factors	Levels	
a) Level of intoxication	2 levels	Sober / drunk
b) Type of relationship	2 levels	Casual / committed
c) Place of sexual encounter	2 levels	Initiator's residence / partner's residence

Note. There is lack of consensus around the interpretations of the different types of relationships (Howard et al., 2015). For the purpose of this study, committed relationship indicates an exclusive sexual and romantic relationship (Banker et al., 2010). Casual dating refers to going out formally and has the potential to turn into a longer-term committed relationship (Kuperberg & Padgett, 2015). Shortened definitions of these terms are incorporated into the vignettes so that the interpretations of the terms are consistent and as intended.

Unlike previous studies, the vignette scenarios of this study used gender-neutral names for the vignette characters and the names were different for each vignette. The purpose of using gender-neutral names was to minimize the influence of sexual scripts in students' evaluations of the vignettes. Sexual scripts often follow socially expected sexual and consent roles and behaviors for specific genders (Gagnon & Simon, 2005). One example is the expectation or assumption that men are the initiators or aggressors in sexual encounters and women are the receivers of sexual advances (Gagnon & Simon, 2005). To lessen the influence of consciously or unconsciously held gendered expectations around sex and consent, the vignette characters were given gender-neutral names. The vignette scenarios were also unique for depicting verbal as well as nonverbal consent-seeking by the sexual initiator and for including use of verbally coercive tactics after the partner declines sexual advance. Specifically, in the first scenario, the initiator used nonverbal consent-seeking and proceeded to accuse partner of leading them on after partner's non-consent. In the second scenario, the initiator used nonverbal consent-seeking and repeatedly questioned partner after partner's non-consent. In the third scenario, the initiator used explicit, verbal consent-seeking and went on to warn and threaten

partner after the partner's refusal of sexual advance. The examples of verbally coercive tactics were based on findings from past research (Eaton & Matamala, 2014). In addition to the three scenarios, a series of statements were developed that the students used to assess consent seeking and coercive behaviors in the vignettes. The three vignette scenarios (with the vignette factors in parenthesis) were as follows:

1. Austen and Dakota are college students who (have been going out together without any expectation of commitment). Last week, they were hanging out and having drinks at (Austen's apartment). They both were (drunk) when Austen leaned in and kissed Dakota. Dakota did not feel like starting anything sexual and moved away in hesitation. Austen proceeded to repeatedly accuse Dakota of leading them on. In the end, they ended up having sex.
2. It has been a few months since two undergraduate students, Emory and Berkley, started (a committed, exclusive relationship). A couple of weeks ago, they spent the day at (Berkley's apartment) watching movies and having drinks. They both were (drunk). At one point, while they were sitting on the couch, Berkley moved closer and put both arms around and kissed Emory. When Emory slowly pushed away Berkley's arms and continued watching the movie, Berkley repeatedly questioned why they were together. Emory explained that they just wanted to watch the movie and are not interested in having sex, but Berkley was not pleased. In the end, they ended up having sex.
3. Blair and Jamie have been (in a committed, exclusive relationship) since starting college last semester. On weekends, they usually get together at Blair's or Jamie's apartment and order in food and watch shows. Last month,

they were hanging out at (*Jamie's apartment*). They spent the day watching shows and having drinks. They both were (*sober*). At one point, Jamie pulled Blair closer and put both arms around Blair. Jamie asked if Blair wanted to have sex, and Blair said no. Jamie was irritated and warned Blair that they could stop seeing each other. In the end, they ended up having sex.

a.2. After the three vignette scenarios were generated and the vignette factors were determined, virtual cognitive interviews were conducted based upon a probing technique to: i) assess the understandability and plausibility of the scenarios, the items/statements and the response categories, ii) get insight into participant's thoughts, comprehension and response processes, and iii) identify any potential issues (Collins, 2003; Miller, 2003). The interview guide is presented in Appendix A. All of the interviews took place virtually and were comprised of an interview as well as web-based response components. All interviews were audio recorded.

During the interviews, respondents were first presented with a web-based consent form and were encouraged to ask questions. Once the consent process was completed, they were presented with one scenario at a time on an online platform. After they read the scenario, they were asked what they thought the scenario was about, if there was anything difficult to understand about the scenario, which person they thought was the sexual initiator, if they can state the gender of the initiator and the partner, if the behaviors of the individuals indicate consent to sexual activity, if they see any concerns about the interactions of the individuals, if any of their responses would change if the level of the vignette factors were changed for any of the three factors, and if the scenario was realistic. The students were also asked to

describe what each of the vignette factors and the respective levels meant to them to assess if their interpretations were as intended (level of intoxication – sober/drunk; type of relationship – casual/committed; place of intimate encounter– sexual initiator’s/partner’s residence). These questions and probes were asked after the interviewee read each of the three scenarios. In addition, a fourth scenario was included, where the characters’ names were what would typically be considered gender-specific (this fourth scenario was identical to the gender neutral scenarios with the exception of the gender-specific names). This was done to determine if the interview participants’ responses would differ from the gender-neutral scenarios. In the next part of the interview process, participants were presented with one scenario along with the items/statements and were asked to rate them to show their level of agreement whether the sexual initiator in the scenario sought consent and whether the initiator’s behaviors were free of coercion. The rating options ranged from 1-strongly disagree to 7-strongly agree. After the students were done rating, they were asked to describe what each statement was about, how they would repeat the statement in their own words, if any of the statements were difficult to understand, and if the response categories were easy or hard to use.

Recruitment for the interviews was done through a flyer announcement distributed to different campus groups (the university’s student-run help center, public health classes) to maximize the chance of attracting a diverse group of participants. The recruitment flyer is presented in Appendix E. The interviews were conducted in June 2021 and a total of six students participated. The enrollment size of 6 was determined to be sufficient for cognitive interviewing as research has found

that sample size as small as 5 can yield considerable gains in detecting problems, while additional problems can be identified at larger sample sizes (Blair & Conrad, 2011). The interviews took approximately 30 minutes and all participants received a \$20 Amazon e-gift card. The interviews were done in two rounds, with 3 students participating in each round. The responses from the first round were used to refine the vignettes, and the second round served to check if anything else needed to be changed. The demographic and background characteristics of the interview participants is presented in Table 2. Four of the participants identified as woman, 1 as man, and 1 as trans man. The majority identified as Asian American and were from the College of Computer, Mathematical and Natural Sciences. Half of them indicated that they were Undergraduate Juniors.

Table 2. Demographic characteristics of cognitive interview participants

	N
Age (mean)	19.7
Gender	
Woman	4
Man	1
Trans man	1
School year	
Freshman	2
Sophomore	1
Junior	3
Race	
Asian American	4
White/European American	2
School year	
College of Behavioral & Social Sciences	1
College of Behavioral & Social Sciences; College of Computer, Mathematical and Natural Sciences	1
College of Computer, Mathematical and Natural Sciences	3
College of Arts and Humanities, College of Education	1

After the interviews were completed, the responses were transcribed for all participants. To ensure accuracy, the transcripts were then compared with the audio recordings. For data analysis, summaries of participant responses were entered in a matrix that was created based on the main interview questions (Blair & Brick, 2010; Knafl et al., 2007). The responses to each item were then examined across respondents to identify areas of refinement for the vignettes and vignette items.

The findings from the first round of 3 interviews showed that the participants recognized changes in the vignette factors particularly with respect to level of intoxication and type of relationship, and they used that as a basis to vary their vignette evaluations. This finding confirmed that the factor levels as originally specified were distinct and clear enough to solicit different responses for different factor levels. The interview findings also showed that all participants correctly identified who the sexual initiator was in all of the scenarios. In addition, without being prompted about the presence of “coercion” in the scenarios, participants described the behaviors of the sexual initiator as “emotional manipulation,” “peer pressure,” “insecurity,” and “forcing.” This confirmed that participants’ comprehension of the content of the vignettes was consistent with the intended meanings. While all of the participants stated that they could not tell the gender of the characters in the three gender-neutral scenarios and that did not affect their responses, two noted that the initiator was “probably” a male. The gender-specific scenario that was part of the cognitive interviews was excluded from the main vignette experiment as participants indicated that not knowing the gender did not factor into their vignette evaluations. Furthermore, the vignette items/statements were modified for better

clarity based on participants' feedback. Specifically, the name of the sexual initiator was included in the two vignette evaluation items/statements about the initiator's consent seeking and coercive behaviors, and the wording of the item relating to coercive behavior by the sexual initiator was changed to a reversed statement (i.e., There was *no* verbal coercion by [name of sexual initiator]). The second round of 3 interviews were affirming of the findings of the first round with respect to understandability of the vignettes and clarity of the items. The findings from both rounds of interviews also indicated that the scenarios, while brief, were plausible and realistic based on experiences the participants stated as having heard from other students. The majority of the participants worked at the university's student-run help line and were familiar with helping students in distress. Their reactions to participating in the interviews were positive and pointed out that the topic was highly relevant to the college community. Two students specifically inquired about learning the findings of the study.

b) Sampling of vignette subsets/setting up of the experimental design

The three vignette factors and their respective levels (2 levels each) and three versions of the vignette scenarios resulted in a total combination of 24 vignettes (2 x 2 x 2 x 3; also known as vignette population). The entire vignette population was carefully reviewed to make sure that all 24 vignettes are clear. Since 24 vignettes are too many to be assigned to a single respondent, subsets of vignettes were sampled using an experimental design called D-optimal (Auspurg and Hinz, 2015). With D-optimal, the vignette population is partitioned into subsets that can produce unbiased and precise/efficient parameter estimates for variables of interest, while the entire

vignette population is exhaustively evaluated by the full study sample. The characteristics of a D-optimal design is that it can ensure “unbiasedness” and efficiency are: unconfounded effects (i.e., the effects of two factors can be estimated independently), orthogonality (i.e., the factors are uncorrelated), and balancedness (i.e., each vignette in the vignette population is evaluated the same number of times; Su & Steiner, 2018). D-optimal designs, compared to other designs such as random sampling, avoid confounding of effects of interest and allow to achieve efficiency (i.e., obtaining the greatest amount of statistical information to test the hypotheses; Su & Steiner, 2018). Appendix F presents the vignette population and the four sets of samples selected using the Algorithmic Experimental Design (AlgDesign package) in R (Wheeler, 2019). Appendix H presents the confounding structure from the vignette partitioning steps. The vignette subsets were confounded with higher order interaction terms (specifically, with 3 of the three-way interactions), which meant that the estimates for those particular interaction terms were not estimated independently.

After the vignette population was partitioned into 4 sets of 6 vignettes (Appendix F), the design was uploaded onto a web-based survey platform, where additional design features were also included (i.e., randomized presentation of the vignettes in each set, and randomized selection of each set). The set up was such that respondents would see only one vignette and the related vignette items/statements on a page. After the entire experimental survey was set up online, it was successfully implemented with small number undergraduate students with no issues before the main study was launched.

Methods

Sample

Using listservs obtained from the university's Registrar's Office, the survey invite was sent out to 8,565 male and 7,800 female sophomore, junior and senior undergraduate students who have been at the university for at least two full semesters. Freshman students were excluded to ensure that the invited participants have taken the initial mandatory sexual assault prevention training (The first sexual assault prevention training that is required for all incoming undergraduate students is to be completed in the first year. The training covers topics such as definitions of consent, sexual assault and harassment).

Table 3. Demographic characteristics of survey respondents (N=420)

	N (%)
Age, mean (standard deviation)	20.37 (2.5)
Gender	
Female	265 (63.1%)
Male	128 (30.5%)
Non-binary, other	17 (4%)
Race	
White/European/European American	250 (59.5%)
Black or African American	28 (6.67%)
Hispanic or Latino/a	17 (4%)
Asian/Asian American	73 (17.4%)
Middle Eastern/North African	13 (3.1%)
Other, and bi/multiracial	39 (9.3%)
Class	
Freshman	11 (2.6%)
Sophomore	129 (30.7%)
Junior	145 (34.5%)
Senior	129 (30.7%)

Note. Eleven respondents indicated that they were freshman and have been at the University for more than 2 semesters. Therefore, they were included in analyses.

Data collection took place between mid-October and mid-December of 2021. A randomly drawn raffle from forty \$25 Amazon e-gift cards was offered as an incentive for participation. Of the 420 students included in the analyses, the majority self-identified as female (63.1%), White/European/European American (60%), and junior class (35%).

Measures

Assessment of verbal coercion and consent in vignettes: A series of statements were used to assess students' evaluation of consent seeking behaviors (Sexual initiator sought consent) and the absence of coercion in the vignette scenarios (No coercion by the initiator; Appendix B). The items were presented on the same page as each vignette; as such, the framing of the statements was customized to the specific vignette (e.g., with references to the names of the characters in the specific vignette). The items were rated on a 7-point scale that ranged from 1-strongly disagree to 7-strongly agree. Higher scores on consent seeking statements indicated greater agreement that the sexual initiator sought consent from the partner, and higher scores on coercion statements meant greater agreement that that the initiator was *not* acting coercively.

Other measures

Attitude toward establishing consent represents the extent to which participants view establishing consent favorably. The scale, developed by Humphreys & Brousseau (2010), has 11 items rated from 1-strongly disagree to 7-strongly agree (Cronbach's $\alpha=0.84$ for a sample of undergraduate students). The scale included items such as "I feel that sexual consent should always be obtained before the start of

any sexual activity” and “I think it is equally important to obtain sexual consent in all relationships regardless of whether or not they have had sex before.” The scale scores were calculated by computing means. Higher scores reflected more positive attitude. The Cronbach’s alpha for the study sample was 0.91.

Endorsement of alcohol-involved consent scripts is the degree to which participants accept myths about consent or what counts as consent when drinking is involved. The Campus Beliefs and Myths (CBM) scale with 6 items was used (Ward et al., 2012) to measure endorsement of consent scripts. The CBM has acceptable internal consistency with Cronbach’s alpha of 0.72 (Ward et al., 2012). The items included “Consensual drunk sex is a normal and harmless part of college life” and “When a person is drinking alcohol, the person is implying interest in engaging in sexual activity.” The response options followed a 7-point Likert-type scale from 1-strongly disagree to 7-strongly agree. The scale scores were calculated by taking sums. Higher sum scores indicated greater acceptance of consent scripts. In this study, the Cronbach’s alpha was 0.68.

Demographic and background information: Variables such as gender identity (woman, man, trans woman, trans man, non-binary) and history of sexual victimization (yes, no) were measured and included in analyses.

The research protocol for this study was reviewed and approved by the university’s Institutional Review Board.

Data Analysis Steps

Data analysis included checking for duplicate entries by the same student; conducting missing data analysis; and creating deviation coding, and running multilevel regressions in R software. Multilevel modeling was warranted for the design of this study to investigate how much variation was at the vignette-level (level 1) and how much was at the respondent-level (level 2). Specifically, the random intercept model was chosen, where intercepts vary at level 1 while slopes (the coefficients) remain fixed. For all categorical independent variables, deviation coding was chosen (e.g., two levels coded as 1 and -1) as dummy coding confounds main and interaction effects (Steiner et al., 2016). In this case, a coefficient estimate for main effect indicates the average deviation for the level of the variable from the grand mean (Dziak et al., 2012).

The primary research questions of this study focused on: 1) determining the main and interactive effects of vignette factors (level of intoxication – sober/drunken; type of relationship – casual/committed; place of intimate encounter– sexual initiator’s/partner’s residence) on the dependent variables (DV; “Sexual initiator sought consent” and “No coercion by the initiator”), and 2) examining the effects of respondent-level variables (gender, endorsement of consent scripts, attitude towards establishing consent, history of sexual victimization). The specifications of level 1 and level 2 models are given as follows.

Specification for level 1:

$$DV_{ij} = \beta_{0j} + \beta_{1j}Intoxication_{ij} + \beta_{2j}RelationshipType_{ij} + \beta_{3j}Place_{ij} + \beta_{4j}Scenario_{ij} + \beta_{5j}Set_{ij} + \beta_{6j}IntoxicationXRelationshipType_{ij} + \beta_{7j}IntoxicationXPlace_{ij} + \beta_{8j}IntoxicationXScenario_{ij} +$$

$$\beta_{0j}\text{RelationshipTypeXPlace}_{ij} + \beta_{10j}\text{RelationshipTypeXScenario}_{ij} + \beta_{11j}\text{PlaceXScenario}_{ij} + \\ \beta_{12j}\text{IntoxicationXRelationshipTypeXPlace}_{ij} + \\ \beta_{13j}\text{IntoxicationXRelationshipTypeXPlaceXScenario}_{ij} + \varepsilon_{ij} \text{ where "i" is vignette "i", and} \\ \text{"j" is respondent "j"}$$

The above equation represents the vignette evaluation score (for “Sexual initiator sought consent” or “No coercion by the initiator”) as a function of the intercept for the respondent, (fixed) predictors plus residual error at level 1. Set is a level 2 variable.

Specification for level 2:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}\text{RespondentGender} + \gamma_{02}\text{Attitude} + \gamma_{03}\text{Myths} + \gamma_{04}\text{History} + \mu_{0j}$$

In the level 2 equation, γ_{00} represents the mean of intercepts across all respondents (fixed), γ_{01} to γ_{04} represent averaged slopes of the respondent-level variables (also fixed), and μ_{0j} is random error. Together, they explain variation in the intercepts (β_{0j}).

$\beta_{1j} = \gamma_{10}$; $\beta_{2j} = \gamma_{20}$; $\beta_{3j} = \gamma_{30}$; $\beta_{4j} = \gamma_{40}$; $\beta_{5j} = \gamma_{50}$; $\beta_{6j} = \gamma_{60}$; $\beta_{7j} = \gamma_{70}$; $\beta_{8j} = \gamma_{80}$; $\beta_{9j} = \gamma_{90}$;
 $\beta_{10j} = \gamma_{100}$; $\beta_{11j} = \gamma_{110}$; $\beta_{12j} = \gamma_{120}$; $\beta_{13j} = \gamma_{130}$; where γ represents fixed slope for the predictor variables, averaged across respondents.

Specification for combined random intercept model:

$$\text{DV}_{ij} = \gamma_{00} + \gamma_{01}\text{RespondentGender} + \gamma_{02}\text{Attitude} + \gamma_{03}\text{Myths} + \gamma_{04}\text{History} + \gamma_{10}\text{Intoxication}_{ij} + \\ \gamma_{20}\text{RelationshipType}_{ij} + \gamma_{30}\text{Place}_{ij} + \gamma_{40}\text{Scenario}_{ij} + \gamma_{50}\text{Set}_{ij} + \\ \gamma_{60}\text{IntoxicationXRelationshipType}_{ij} + \gamma_{70}\text{IntoxicationXPlace}_{ij} + \gamma_{80}\text{IntoxicationXScenario}_{ij} + \\ \gamma_{90}\text{RelationshipTypeXPlace}_{ij} + \gamma_{100}\text{RelationshipTypeXScenario}_{ij} + \gamma_{110}\text{PlaceXScenario}_{ij} + \\ \gamma_{120}\text{IntoxicationXRelationshipTypeXPlace}_{ij} + \\ \gamma_{130}\text{IntoxicationXRelationshipTypeXPlaceXScenario}_{ij} + \mu_{0j} + \varepsilon_{ij}$$

It was hypothesized that, on a Likert scale ranging from 1-strongly disagree to 7-strongly agree, the vignettes would be rated higher (i.e., as more agreeable) for “Sexual initiator sought consent” and that there was “No coercion by the initiator” when the individuals in the scenarios are: a) sober, b) in a committed relationship, and c) the sexual encounter takes place at the initiator’s residence, compared to when both are drunk, are in a casual relationship and the encounter takes place at the partner’s place of residence. In addition, it was hypothesized that the vignettes would be rated lower (i.e., as less agreeable) for “Sexual initiator sought consent” and that there was “No coercion by the initiator” by female students, students with lower acceptance of alcohol-involved consent scripts, and those with more positive attitude toward establishing consent.

Results

In total, 444 students participated in the survey (a response rate of 2.7%). The data was checked for any duplicate and unrealistic data. Three cases were found to be duplicate entries by the same respondents and, thus, were removed from the data. Review of descriptive statistics found no unusual or unrealistic data. Examination of missing data on the scale measures showed that attitude toward establishing consent and endorsement of alcohol-involved consent scripts had about 8% and 9% data missing, respectively. Little’s Missing Completely at Random tests did not provide evidence that the assumption of missing at random would be violated. Chi-square tests with background variables (e.g., gender) provided support that there was no systematic difference across the respondents with missing data vs. non-missing with respect to those variables. Therefore, the missing values for the scale measures were

imputed. Missing data on outcome variables were not imputed as the imputation model would be unnecessarily complex with higher order interaction terms. Twenty-one cases were excluded for missing data on all of the dependent and independent variables, resulting in the final analytical sample of 420 respondents.

Table 4 presents the multilevel analyses for students' rating of the vignette scenarios as to whether the sexual initiator sought consent and did not act in a coercive way (the ratings were made on a scale of 1-strongly disagree to 7-strongly agree). The regression estimates for all the categorical independent variables are based on deviation coding and reflect the difference between the mean of the DVs for a level of a vignette factor and the grand mean (i.e., the pooled mean across both levels of the vignette factor). For level of intoxication, there was a significant difference in the vignette assessments of whether consent was sought by initiator when the vignette characters are drunk vs. sober. As hypothesized, students' assessment scores were lower, on average, by .12 (-0.06×2) when the vignette characters were drunk instead of sober. Also consistent with the hypothesis, for type of relationship, students gave scores that were lower by .10 (-0.05×2), on average, when the vignette characters were in a casual relationship compared to a committed relationship. These results suggest that the consent seeking behaviors of the sexual initiator were evaluated as less agreeable when the individuals involved were drunk or in a casual relationship. Neither one of these two vignette factors was significant for absence of coercion. Place of encounter was non-significant as well.

The results showed that there were significant differences in students' vignette scores with respect to the three scenarios. On a Likert scale ranging from 1-strongly

disagree to 7-strongly agree, students, on average, rated whether the sexual initiator sought consent in Scenario 1 (where initial consent-seeking was expressed nonverbally) lower by .89 than the grand mean. The ratings were lower for Scenario 2 (where initial consent-seeking was nonverbal) by .74 points. The deviation of the scores for Scenario 3 (where initial consent-seeking was explicit and verbal) from the grand mean was, on average, higher by 1.63 ($.89 + .74$) points. Compared to Scenario 3, the ratings for whether the initiator sought consent were lower by 2.52 points ($.89 + 1.63$) for Scenario 1 and by 2.37 points ($.74 + 1.63$) for Scenario 2. This suggests that vignettes describing nonverbal consent-seeking behaviors were consistently scored lower than vignettes depicting explicit and verbal consent-seeking. For absence of coercion, students' ratings of Scenario 2 (where the initiator's coercive behavior involved repeated questioning after partner's non-consent) was, on average, higher than the grand mean by 0.2. In other words, on average, there was more agreement that there was no coercion in the scenario involving repeated questioning post partner's initial sexual refusal.

While the hypothesis that female students would give lower scores for the initiator's consent-seeking was not supported, the results showed that male students, on average, gave higher scores than the grand mean that the sexual initiator sought consent (higher by 0.22 points). As hypothesized, students with more positive attitude toward establishing consent gave lower scores that the initiator sought consent. They also gave lower scores that there was no verbal coercion from the initiator. Students with higher acceptance of alcohol-related consent scripts gave higher scores for both dependent variables (sexual initiator sought consent, and no coercion by the initiator).

The significant three-way interactions between level of intoxication, type of relationship and scenario indicated that the two-way interactions between level of intoxication and type of relationship differ across the scenarios for both dependent variables (Figures 2 & 3). The three plots under Figure 2 show that the impact of relationship type on DV1 differs based on level of intoxication across the three scenarios. However, given that the vignettes were evaluated on a scale ranging from 1 to 7, the actual differences in the impact of relationship type on DV1 based on level of intoxication are too small to infer practical significance. The three plots under Figure 3 show that the impact of relationship type on DV2 differs based on level of intoxication across the three scenarios, and the plots under Figure 4 show that the impact of place of encounter on DV1 differs based on level of intoxication across the three scenarios. None of the two-way interactions were significant for either dependent variable.

Discussion

This study sought to investigate undergraduate students' interpretations of sexual consent seeking and verbally coercive behaviors using a factorial vignette experiment. The study focused on two consent standards that are common in many campus sexual misconduct policies – consent seeking by the sexual initiator, and the absence of coercion – and examined the predictive effects of factors relevant to students' interpretations of these standards. The study assessed the main and interactive effects of vignette factors (level of intoxication, type of relationship, place of encounter), and the effects of respondent-level variables (gender, endorsement of consent scripts, attitude towards establishing consent, history of sexual victimization).

Consistent with the hypotheses, level of intoxication and type of relationship were significant predictors for students' evaluation of whether consent was sought in the vignette stories. The results showed that the vignettes where the individuals were drunk were rated lower (on a scale ranging from strongly disagree to strongly agree) for the initiator's consent seeking behaviors. That is, there was lower agreement that the initiator sought consent when the individuals in the vignettes were presented as drunk, compared to when the individuals were depicted as sober. With respect to type of relationship, the vignettes depicting casual relationship were, on average, scored lower on the initiator's consent-seeking, compared to the vignettes describing exclusive, committed relationship. In other words, there was lower agreement that the initiator sought consent when the type of relationship was given as casual, compared to exclusive, committed relationship. The literature does indicate that perceived need for explicit consent-seeking is lower for committed or longer-term relationships (Beres, 2014; Humphreys, 2007; Righi et al., 2021; Willis & Jozkowski, 2019). Although this study simply asked whether consent was sought by the initiator (not whether consent-seeking was explicit or otherwise), respondents might have assumed there was some subtle "consent communication cue" (Willis & Jozkowski, 2019) present with the committed partners, thus, giving the vignettes with committed partners, on average, higher scores for consent-seeking (i.e., indicating greater agreement that the initiator sought consent). While different forms of consent communication may be adopted as the duration of a relationship increases (Willis & Jozkowski, 2019), it is nonetheless crucial for consent trainings to make sure that

such responses are not stemming from assumptions that consent-seeking somehow becomes less important the longer partners have been together.

The study also found that students' vignette evaluations of the initiator's consent seeking behaviors were lower, on average, when initial consent-seeking was primarily non-verbal (Scenario 1 and 2) and higher when consent-seeking is explicit and verbal (Scenario 3). This means that students indicated highest agreement that consent was sought by the initiator for vignettes describing direct and explicit communication of consent-seeking. Previous research have documented students' feelings that affirmative consent standards are "awkward" (Curtis & Burnett, 2017). At least in judging hypothetical scenarios, however, it appears that students have strong support for explicit consent-seeking.

Another important finding is that male students, on average, indicated higher level of agreement that the sexual initiator sought consent. This is consistent with the literature that males are more likely to interpret ambiguous sexual communication or sexual scenarios as consensual (Bostwick and Delucia, 1992; Sawyer et al., 1998). In these previous studies, however, the vignette scenarios used were gender-specific. Particularly, in the study by Sawyer et al. (1998), all of the dating scenarios depicted a male character as the sexual initiator and a female as the partner giving consent. The unique contribution of this study is that it used gender-neutral characters where the gender of the sexual initiator and the partner is not given. It is interesting that male students still gave higher scores when assessing whether the initiator sought consent even when gender is not known. It would be important for intervention initiatives to

address gender discrepancies in interpreting consent-seeking behaviors as such differences can potentially lead to sexual assault.

For the second outcome assessing whether the sexual initiator's behavior was free from coercion, the vignettes where the initiator used repeated questioning after partner's non-consent (Scenario 2) received higher level of agreement, and the vignettes where the initiator threatened to stop seeing the partner (Scenario 3) received lower level of agreement. This could be because the vignettes with post-refusal questioning might have been interpreted as less severe, thus receiving higher scores as to whether the behavior was non-coercive. As expected, students with more positive attitude toward establishing consent indicated lower agreement that the initiator sought consent and that the initiator was not verbally coercive. In contrast, students with higher level of endorsement of alcohol-involved consent scripts indicated higher agreement that the initiator sought consent and that the initiator was not coercive.

One of the limitations of the study is the non-representativeness of the study sample. The eligibility criteria for participating in the study was having been at the university for at least two full semesters to ensure that students have taken the first of the mandatory sexual misconduct prevention trainings. Thus, the sample was primarily comprised of sophomores and upper level students who had taken the training; results could be different if the freshman class was included. The results may not generalized beyond the vignette scenarios of this study. Another limitation related to potentially omitted vignette factors that are not accounted for in the study. Establishing the development of the vignettes in the literature, and the use of

cognitive interviews to refine them, resulted a set of final vignettes that closely follow real-world experiences. While this allowed respondents to have clear understanding of the situations, without having to fill in any missing parts, it is still possible that there may be vignette factors that were not accounted for in this study. In addition, it is important to note that the brevity of the vignettes is not to suggest that sexual encounters follow distinct behaviors where one person seeks consent and initiates sexual activity and another person responds.

Despite the limitations, this study applied a robust and rigorous experimental methodology to better understand predictors of undergraduate students' interpretations of consent seeking and coercion. The study intentionally focused on specific consent standards stated in many campus policies (including the university where this study took place) - i.e., the person initiating the sexual activity has the responsibility to seek consent, and consent should be obtained free of coercion. As discussed above, insights from this study support that students use contextual factors in their assessment of consent-seeking behaviors - specifically level of intoxication and the type of relationship. Students have also shown support for explicit, verbal consent-seeking. Campus sexual violence prevention efforts should incorporate specific discussions around how different factors may shape students' views of consent and consent behaviors not just in hypothetical scenarios but to have them reflect on their own beliefs, perceptions and experiences. Similarly, campus education initiatives should give greater emphasis on verbal sexual coercion as research supports it is highly prevalent among college students (Struckman-Johnson et al., 2003) but may not necessarily be recognized by some as a form of sexual aggression

(e.g., Eaton & Matamala, 2014). This study also supports that campus efforts should recognize the apparent gender differences in interpreting consent-seeking behaviors. This can be an area for future research to investigate gender-based differences specifically in inferences of consent-seeking behaviors and what such differences may mean in terms of whether a sexual encounter is consensual or not.

To conclude, this study took the approach of unpacking consent definitions (and the specific standards), as presented in campus policies and student trainings, and assessing students' interpretations of the standards and what personal and contextual factors explain differences in interpretations. Campus sexual violence prevention and consent training strategies could benefit from using a similar approach to covering every element of consent while also recognizing and addressing the broader factors that underlay students' views of what constitutes consent.

Table 4. Results of multilevel analyses for students' evaluation of consent and coercion in the vignettes

	Consent sought by initiator			No verbal coercion by initiator		
	B	SE	t-value	B	SE	t-value
Intercept	4.71	0.52	8.99	2.67	0.48	5.51
Level 1: Vignette subsets						
Subset 1	-0.04	0.10	-0.36	0.03	0.09	0.37
Subset 2	-0.03	0.10	-0.27	0.02	0.09	0.18
Subset 3	-0.04	0.10	-0.36	0.07	0.09	0.80
Level 1: Vignette factors						
Level of Intoxication - Drunk (I1)	-0.06	0.03	-2.51	-0.01	0.02	-0.40
Type of Relationship - Casual (R1)	-0.05	0.03	-2.09	0.00	0.02	-0.15
Place of Encounter - Initiator's place (E1)	-0.01	0.03	-0.57	-0.01	0.02	-0.48
Level 1: Vignette scenarios						
Scenario 1 - (S1)	-0.89	0.04	-24.60	0.00	0.03	0.12
Scenario 2 - (S2)	-0.74	0.04	-20.28	0.20	0.03	7.75
Level 1: Level of Intoxication x Type of Relationship						
I1 x R1	-0.03	0.03	-0.93	0.00	0.02	0.00
Level 1: Level of Intoxication x Place of Encounter						
I1 x E1	0.02	0.03	0.58	-0.01	0.02	-0.74
Level 1: Type of Relationship x Place of Encounter						
R1 x E1	0.05	0.03	1.45	0.01	0.02	0.67
Level 1: Level of Intoxication x Scenario						
I1 x S1	0.02	0.04	0.49	0.00	0.03	0.18
I1 x S2	0.04	0.04	0.98	-0.02	0.03	-0.92
Level 1: Type of Relationship x Scenario						

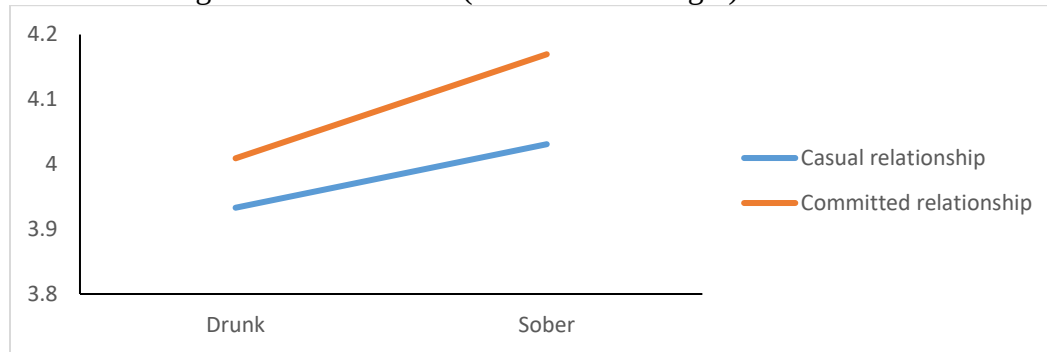
R1 x S1	0.03	0.04	0.95	0.00	0.03	0.10
R1 x S2	0.01	0.04	0.21	-0.03	0.03	-1.27
Level 1: Place of Encounter x Scenario						
E1 x S1	0.02	0.04	0.63	-0.02	0.03	-0.66
E1 x S2	-0.01	0.04	-0.33	0.01	0.03	0.43
Level 1: Level of Intoxication x Type of Relationship x Place of Encounter						
I1 x R1 x E1	0.03	0.03	1.16	0.01	0.02	0.69
Level 1: Level of Intoxication x Type of Relationship x Scenario						
I1 x R1 x S1	0.08	0.03	2.59	-0.07	0.02	-2.99
Level 1: Level of Intoxication x Place of Encounter x Scenario						
I1 x E1 x S1	-0.05	0.07	-0.77	-0.03	0.05	-0.72
I1 x E1 x S2	0.03	0.04	0.75	-0.07	0.03	-2.42
Level 1: Intoxication x Relationship x Place of Encounter x Scenario						
I1 x R1 x E1 x S1	0.00	0.04	-0.11	0.00	0.03	0.19
I1 x R1 x E1 x S2	-0.03	0.04	-0.78	0.02	0.03	0.61
Level 2 respondent-level variable: Gender						
Female (G1)	-0.14	0.10	-1.479	-0.02	0.09	-0.20
Male (G2)	0.22	0.10	2.109	0.14	0.09	1.51
Level 2 respondent-level variable: History of sexual victimization						
Has history (H1)	0.01	0.06	0.166	-0.08	0.06	-1.28
Level 2 respondent-level variable: Attitude toward establishing consent	-0.40	0.07	-5.831	-0.25	0.06	-3.97
Level 2 respondent-level variable: Acceptance of alcohol-involved consent scripts	0.04	0.01	2.994	0.05	0.01	3.85
Number of vignette evaluations	2303			2302		
Standard deviation at level 1	0.83			0.83		

Standard deviation at level 2	1.23	0.86
Variance at level 1	0.70	0.69
Variance at level 2	1.52	0.73

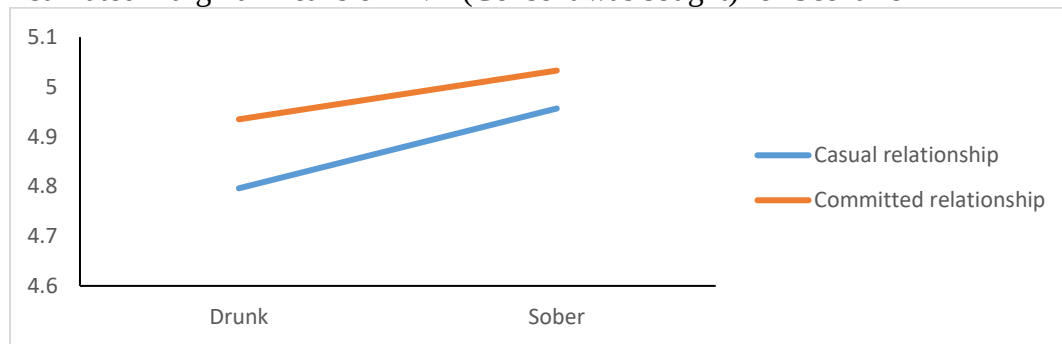
Note. 1) The variables for vignette subsets (Subset 1, Subset 2, Subset 3), vignette factors [Level of intoxication: Drunk - (I1); Type of relationship: Casual - (R1); Place of encounter: Initiator's place - (E1)], vignette scenarios [Scenario 1 (S1), Scenario 2 (S2)], respondent gender [Female (G1), Male (G2)] and history of victimization [Has history (H1)] are deviation coded. 2) The vignette evaluations are made on a 7-point scale, ranging from strongly disagree to strongly agree. 3) t-values in bold and italics represent significance at 0.05.

Figure 2. Three-way interaction plots for level of intoxication x type of relationship x scenario – DV1

Estimated marginal means of DV1 (Consent was sought) for Scenario 1



Estimated marginal means of DV1 (Consent was sought) for Scenario 2



Estimated marginal means of DV1 (Consent was sought) for Scenario 3

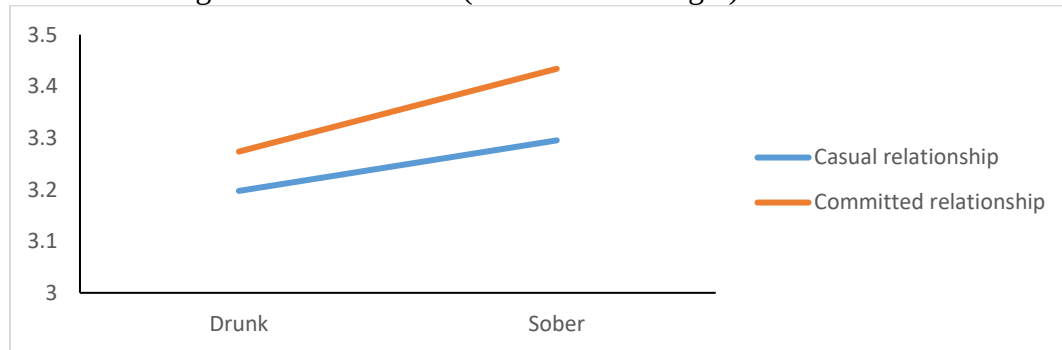


Figure 3. Three-way interaction plots for level of intoxication x type of relationship x scenario – DV2

Estimated marginal means of DV2 (No coercion) for Scenario 1



Estimated marginal means of DV2 (No coercion) for Scenario 2



Estimated marginal means of DV2 (No coercion) for Scenario 3

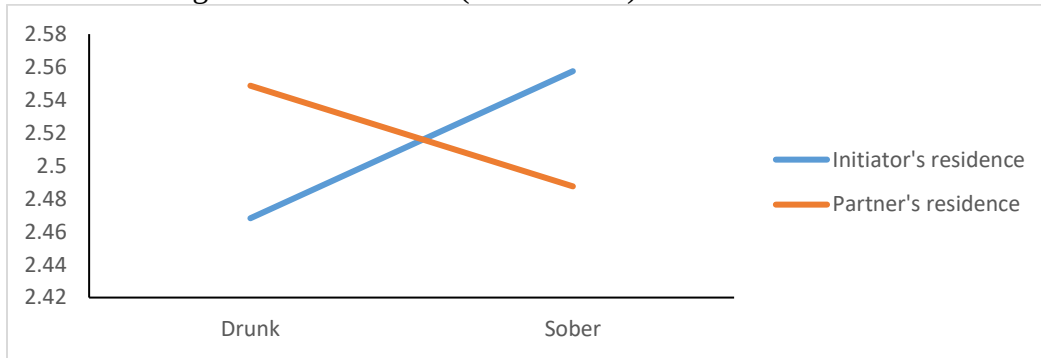


Figure 4. Three-way interaction plots for level of intoxication x place of encounter x scenario – DV2

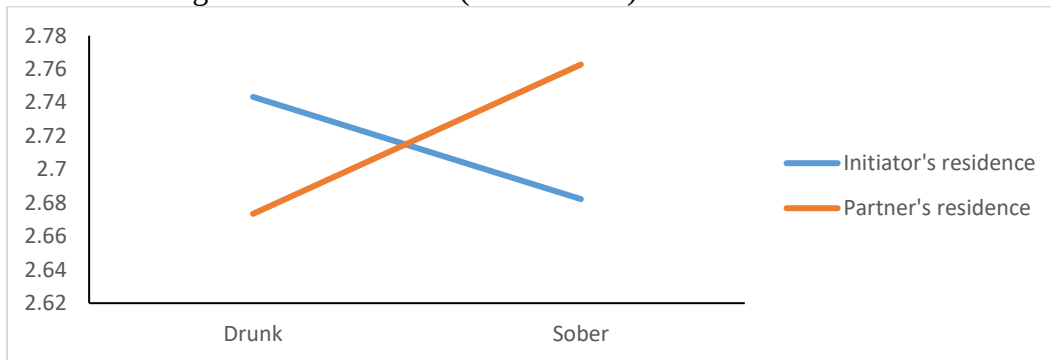
Estimated marginal means of DV2 (No coercion) for Scenario 1



Estimated marginal means of DV2 (No coercion) for Scenario 2



Estimated marginal means of DV2 (No coercion) for Scenario 3



Chapter 4: Examining the Relationship between Alcohol-Involved Sexual Consent Scripts and Consent Attitudes among Undergraduate Students

Abstract

Sexual violence is a significant public health problem among the undergraduate student body. This study examined students' endorsement of alcohol-involved sexual consent scripts and the impact on their attitude toward establishing sexual consent. The analytical sample of the study was comprised of 420 undergraduate students at a mid-Atlantic public university, with an average age of 20.37 ($SD = 2.52$). Data were collected through a web-based survey administered in the Fall semester of 2021. Hierarchical regression was conducted to assess the unique contribution of endorsement of alcohol-involved consent scripts in explaining consent attitudes, after accounting for gender identity, relationship status, and participation in campus athletic sports. The results showed that endorsement of consent scripts involving alcohol was significantly and negatively related to attitude toward establishing consent ($B = -0.09, p < .001$) and uniquely explained 22.4% of the variation in consent attitudes. In addition, female students, relative to males, and those who indicated not currently dating, compared to those in a steady relationship had significantly more positive attitudes toward consent ($B = 0.42, p < .001$ and $B = 0.23, p = 0.009$, respectively). The study findings further the research literature by identifying the explanatory power of acceptance of alcohol-involved consent scripts in predicting students' consent attitudes. The findings also support the call by researchers for campus sexual violence prevention interventions to address relevant contextual variables.

Keywords: Sexual consent scripts, consent attitudes, drinking, sexual violence prevention, undergraduate students

Introduction

Sexual violence is a prevalent public health issue. The definition given by the Centers for Disease Control and Prevention (CDC) is “a sexual act that is committed or attempted by another person without freely given consent of the victim or against someone who is unable to consent or refuse” (Basile et al., 2014). A population that experiences the highest rates of sexual victimization is college age groups, particularly females age 18-24 (CDC, 2014; Langton & Sinozich, 2014). Studies have shown that 15.5% to 38% of female college students experienced at least one form of sexual violence since starting college (Cantor et al., 2015; Carey et al., 2015; Fisher et al., 1999; Flack et al., 2007; Krebs et al., 2007; Mellins et al., 2017; Nasta et al., 2005), and about 12.5% male students have experienced at least one incident of sexual violence (Mellins et al., 2017). A recent systematic review of campus sexual assault surveys administered between 2010 and 2016 found a prevalence rate of 20.4% among female undergraduate students and 4.9% among male students who participated in the surveys (Rosenberg et al., 2019). Males offending against females is the most common sexual violence incident among students (Kilmartin & Berkowitz, 2005). Alarming, the prevalence rates have not changed much in decades. A study from over two decades ago involving 233 2- and 4-year institutions found that 15.5% of female students had experienced one form of victimization (Fisher et al., 1999). Sexual violence continues to be a persistent problem among college students.

In response to this public health crisis, institutions of higher education adopted reporting procedures and sexual misconduct policies and provided definitions of

sexual consent (Graham et al., 2017). Over 90% of colleges and universities have published their policies online with about 88% providing sexual consent definitions (Graham et al., 2017). The consent definitions in campus policies cover topics such as responsibility to seek consent, instances when one is unable to consent, communication of consent, expression of consent voluntarily, withdrawal of consent, and sexual coercion (Graham et al., 2017). Many institutions also require their students to complete sexual assault prevention programs (Dills et al., 2016). Researchers have found that campus education efforts are often short-term and information-based, and focus on consent definitions (DeGue et al., 2014; Jozkowski et al., 2015). While college students are generally aware of the legal definitions of consent and ways to communicate consent/non-consent (Beres, 2014; Fenner, 2018), there is lack of evidence on the impact of consent information-based efforts on behavioral changes with respect to reduction in incidents of sexual violence perpetration (DeGue et al., 2014). As a result, researchers have called for a shift in approach and focus of campus programs from primarily providing information to unpacking and understanding the cognitive and cultural contexts in which sexual violence occurs in order to shift attitudes and behaviors (e.g., Hirsch et al., 2019; Jozkowski et al., 2015; Lonsway et al., 1998).

Contextual factors that are relevant to consider include cognitions and norms with respect to gender- and power-related beliefs and stereotypes - e.g., endorsement and adherence to sexual scripts (McMahon, 2010; Warren et al., 2015). Traditional sexual scripts are socially and culturally constructed sexual myths and behaviors that are rooted in gender and power biases (Gagnon & Simon, 2005; Ryan, 2011). These

motivate individuals' behaviors or influence their interpretations of one's own or others' behaviors (Gagnon & Simon, 2005; Ryan, 2011). An example of sexual scripts is adherence to rape myths, which has been linked to perpetration of sexual violence (Loh et al., 2005). Rape myths include: victim blaming (e.g., putting blame on the victim for choosing to go out alone or drink); providing justifications for the perpetrator or trivializing the behavior (e.g., the perpetrator was drunk and did not have awareness of what was happening); the notion that how a woman dresses can be used to explain sexual violence (e.g., a woman dressed provocatively is asking for trouble); or beliefs that perpetrators are often strangers to the victims, which can lead to minimization of sexual assault committed by acquaintances while sexual assault perpetrated by acquaintances make up the majority of incidents among college students (Abbey et al., 1996; Joseph et al., 2013; Kilmartin & Berkowitz, 2005; Payne et al., 1994). A study by McMahon (2010) showed that college students have moderate levels of endorsement of rape myths, with myths pertaining to "he didn't mean to" and "she lied" receiving higher acceptance. This study also found evidence of victim blaming with more than half of participants agreeing or strongly agreeing that "If a girl acts like a slut, she is eventually going to get into trouble." In addition, male students, athletes and those with Greek affiliation were found to have higher rape myth acceptance (McMahon, 2010). This is concerning as acceptance of rape myths is found to significantly, and adversely, impact students' comprehension of sexual consent (Warren et al., 2015).

Another traditional stereotypical script, particularly in a heterosexual sexual encounter, is the expectation or assumption that men are the initiators or aggressors in

sexual encounters and women are the receivers of sexual advances (Gagnon & Simon, 2005; Jozkowski et al., 2017; Jozkowski & Peterson, 2013). Jozkowski and Peterson (2013) argued that men who uphold such beliefs may choose to avoid seeking consent and instead decide to start a sexual act and pretend that the behavior was “unintentional” or “based on misunderstanding” if the partner gets upset (Jozkowski & Peterson, 2013). Likewise, women may choose not to seek consent as one student in an ethnographic study put it, referring to her partner, “he thinks it’s dumb that I ask” (Hirsch et al., 2019). Beliefs that sex is something to be “won” by men and that women can be “convinced” to participate in a sexual activity even if they declined initially are also present among college students (Jozkowski et al., 2017). Not surprisingly, adherence to masculine norms is negatively related to comprehension of sexual consent among male college students (Warren et al., 2015). Gender and power are also at play when it comes to female students’ expression of consent for unwanted sexual encounter. A qualitative study by Jozkowski and colleagues (2017) found that there were times female students expressed consent not out of willingness to have sex, but not to upset partner or because they felt social pressure to have sex after accepting drinks from the person.

The drinking culture among college students is another important element to understanding the context in which sexual violence may occur, with implications for consent. Alcohol is the most widely consumed substance among college students (Lipari & Jean-Francois, 2016), with up to 40% of college students drinking heavily - five or more drinks consecutively over a two-week period (O’malley & Johnston, 2002). Yet, students’ consent scripts *when* alcohol is involved, and *how* such scripts

influence their own attitudes about consent, are understudied. There is some evidence that points to the presence of gendered scripts with respect to alcohol-involved consent norms. Two studies by Jozkowski and colleagues found that some students perceive women accepting drink offers as expressing consent to sex (Jozkowski et al., 2017; Jozkowski et al., 2018). Specifically, beliefs that men are “owed” sex because, for example, they bought drinks to pursue women are found among both college men and women (Jozkowski et al., 2017). Jozkowski et al. (2018) notes that students may not view their endorsement of such beliefs as potentially justifying sexual violence or blaming a victim.

Students often participate in alcohol consumption with alcohol expectancies in mind – i.e., expectations of alcohol-related effects or outcomes that influence their consumption of alcohol (Jones et al., 2001). Alcohol expectancies can include “positive” expectancies such as increasing one’s perceived sociability (e.g., being outgoing) and sense of courage (e.g., feeling unafraid and being daring), reducing tension (e.g., feeling relaxed), perceived improvement in experiences related to sex (e.g., would enjoy sex more), as well as “negative” expectancies such as increasing risk taking tendencies (e.g., Fromme et al., 1993). A study by LaBrie et al. (2011) found that college students, both males and females, reported higher expectancies related to sex while drinking, compared to when not drinking. In addition, male students endorsed higher expectancies related to courage while drinking (LaBrie et al., 2011). Another study found that college men were more likely than college women to report perceived increase in their confidence to consent to sexual activity after drinking alcohol (Marcantonio & Jozkowski, 2021). The authors offer that this

may be because of what is culturally expected as part of being a “man.” It’s important to note that alcohol expectancies referred in the literature as “positive” (e.g., Fromme et al., 1993) may not necessarily relate to positive outcomes. For example, a study by Palmer and colleagues (2010) found that students who used sexually coercive tactics reported higher alcohol expectancies related to sex. Furthermore, even though students report higher sex-related expectancies while consuming alcohol (LaBrie et al., 2011), drinking can adversely impact their inner consent (e.g., safety, comfort, readiness; Jozkowski & Wiersma, 2015). Findings from a survey administered to 794 undergraduate students showed that, after controlling for covariates (e.g., gender), drinking prior to engaging in a sexual activity was related to lower inner consent, especially among single college students (Jozkowski & Wiersma, 2015). Drinking is also related to misperceiving or misinterpreting others’ sexual intent (Abbey, 2011).

While the research on college drinking culture and students’ alcohol expectancies are immensely informative about the college context in which sex and consent occur, there still remains a crucial gap in the literature with regards to consent scripts that students endorse specifically *when* drinking is involved and *how* these scripts relate to their attitude towards ascertaining sexual consent. This study sought to address this literature gap with the goal of informing campus educational initiatives aiming to prevent sexual violence – i.e., to help educational programs incorporate socially and culturally relevant cognitive contexts to shift attitudes and behaviors related to sexual consent. The guiding research question for this study was: How do college students’ adherence to unhealthy alcohol-involved consent scripts influence their attitudes towards establishing sexual consent? In this study, alcohol-involved

consent scripts included beliefs that conflate drinking with consent or that a drunk person can still give consent, as measured by Campus Beliefs and Myths scale (Ward et al., 2012). It was hypothesized that higher endorsement of unhealthy consent scripts would be related to less positive attitude toward establishing sexual consent.

Methods

Sample

The analytical sample was comprised of 420 undergraduate students at a mid-Atlantic public university, with an average age of 20.37 ($SD = 2.52$). After the approval of the research protocol by the university's Institutional Review Board, data were collected through a 20-minutes web-based survey administered in the Fall semester of 2021 as part of a larger study. Students were invited to participate through an email invite sent out to listservs of sophomore, junior and senior students. Freshman students were excluded because the study targeted undergraduate students who had been at the institution for at least 2 full semesters and had taken the institution's mandatory sexual assault prevention program for first-year students. Incentives were provided for participants in the form of a random raffle draw for one of forty \$25 Amazon e-gift cards. Approximately, 63.1% of students identified as female, which is higher than the percentage of female students in the undergraduate student population at the university (49.2%). About 60% identified as White/European/European American, relative to 45% in the student body. The sample was evenly distributed by class among sophomores ($N = 129$), juniors ($N = 145$), and seniors ($N = 129$). Eleven students indicated being a freshman but having been with

the university for at least 2 full semesters. Thus, they were coded as sophomores for the purpose of data analyses.

Measures

Attitude toward establishing consent is a scale that assesses the extent to which participants view establishing consent favorably. The scale, developed by Humphreys & Brousseau (2010), has 11 items rated from 1-strongly disagree to 7-strongly agree (Cronbach's $\alpha = 0.84$ for a sample of undergraduate students). The scale includes items such as "I feel that sexual consent should always be obtained before the start of any sexual activity." The scale scores were calculated by taking means, with higher scores indicating more favorable consent attitude. The Cronbach's α for the study sample was 0.91.

Endorsement of consent scripts involving alcohol is the degree to which participants accept unhealthy beliefs related to consent and drinking. The 6-item Campus Beliefs and Myths (CBM) scale (Ward et al., 2012) was used to measure students' endorsement of consent scripts. The CBM has acceptable internal consistency with Cronbach's α of 0.72 (Ward et al., 2012). The items include "Consensual drunk sex is a normal and harmless part of college life," "When a person is drinking alcohol, the person is implying interest in engaging in sexual activity," and "A person who is drinking heavily can still give legal consent to sexual activity." The response options followed a 7-point Likert-type scale from 1-strongly disagree to 7-strongly agree. Higher sum scores reflected greater acceptance of unhealthy consent scripts. In this study, the Cronbach's α was 0.68.

Demographic and background information: Variables such as gender identity (coded as woman; man; trans woman, trans man, non-binary), relationship status (not dating, casually dating, and in a steady relationship), class (sophomore, junior, senior), history of sexual victimization (yes, no), participation in athletic sports (yes, no), and participation in campus Greek life (yes, no) were included in the study.

Data Analysis Steps

Data analyses were performed in SPSS, Version 27. The specific steps included missing data analyses, assumptions tests, univariate and bi-variate analyses, and hierarchical regression. The regression sought to answer the question: How do college students' adherence to consent scripts involving alcohol influence their attitudes towards establishing sexual consent? The following background variables were considered as control variables: gender, class year, relationship status, history of sexual victimization and participation in campus athletic sports and Greek life.

Missing data analysis on the scale measures showed that attitude toward establishing consent had 8% data missing and endorsement of alcohol myths had about 9% data missing. Little's Test of Missing Completely at Random (MCAR) tests were conducted for both; the results did not provide evidence that the missing at randomness assumption would be violated. No differences were found across the respondents with missing data vs. non-missing with respect to background variables such as gender. Therefore, the missing values were imputed.

Independent samples *t* tests were used to assess differences in attitudes toward establishing consent based on history of sexual victimization, campus Greek life engagement, and athletic sport participation. Similarly, ANOVA was used to examine

attitudinal differences in gender (woman; man; trans, non-binary, other), class (sophomore, junior, senior), and relationship status (not dating, casually dating, and in a steady relationship). Pearson's correlations were performed to look at the relationships between attitude towards establishing consent and endorsement of unhealthy consent scripts. Lastly, hierarchical regression was conducted where the control variables were entered in the first block, and endorsement of unhealthy consent scripts was entered in the second block to predict students' attitude toward establishing consent. For detecting a small effect size of .10, with an α of 0.05 and power of 0.90, the analytic sample of 420 exceeded the minimum sample size needed for the analysis.

Results

The assumptions of regression were tested for i) normality of the residuals (inspection of a Predicted Probability or P-P plot found that the distribution was approximately normally distributed), ii) homoscedasticity (assessment of a scatterplot for the predicted values and residuals found slight violation), and ii) the absence multicollinearity (the variance inflation factor indicated no violation). The data met the assumptions without serious violations; therefore, regression was used to examine the research question as initially planned.

On average, students had a mean score of 6.18 for attitude toward establishing consent ($SD = 0.85$). Independent samples t tests showed that there was a significant difference in attitude based on participation in athletic sports ($p < .001$). The attitude scores for students who reported participation in athletic sports ($M = 4.93$, $SD = 2.03$) was significantly lower than the scores for those who did not report athletic

participation ($M = 6.21$, $SD = .79$). That is, student athletes in the sample had less positive consent attitudes compared to those who are not. No differences were found with respect to participation in campus Greek life or history of sexual victimization; therefore, these variables were excluded from further analyses. The results from ANOVA indicated significant differences between three gender categories (woman; man; and transgender, non-binary and other; $p < .001$) and among the three relationship status groups (not dating, casually dating, and in a steady relationship; $p = .026$). Post hoc tests showed that female students had a higher attitude mean score (i.e., more favorable consent attitudes) than male students, and those who are not dating had more positive consent attitudes than those in a steady relationship. The attitude differences based on class year was not significant, and thus, class was not included in other analyses. With regards to endorsement of unhealthy consent scripts, students had a mean score of 11.71 ($SD = 4.62$). Pearson's correlation results showed that there was a significant, negative correlation between students' acceptance of unhealthy consent scripts and attitude toward establishing consent ($p < .001$). That is, students' endorsement of alcohol-involved consent scripts is associated with less positive consent attitudes.

Table 5. Hierarchical regression results predicting students' attitudes toward establishing sexual consent

	Block 1				Block 2			
	Unstandardized B	SE	ΔR^2	ΔF	Unstandardized B	SE	ΔR^2	ΔF
Intercept	5.82	0.09	0.10	8.60***	6.91	0.13	0.22	125.5***
Athletic participation	-1.10**	0.36			-0.49	0.31		
Gender_female	0.41***	0.08			0.26***	0.08		
Gender_trans, non-binary & other	0.57	0.56			0.26	0.49		
Relationship status_not dating	0.23**	0.09			0.24**	0.08		
Relationship status_casually dating	0.03	0.14			0.15	0.12		
Endorsement of consent scripts					-0.09***	0.01		

Note. 1) Athletic participation, gender and relationship status were dummy coded. The reference category for gender is male, and the reference category for relationship status is steady relationship. 2) ***Significant at $p < .001$; ** Significant at $p < .01$

Table 5 provides the results of the hierarchical regression predicting attitude toward establishing consent. The control variables were entered in Block 1 and the independent variable of interest (endorsement of consent scripts) was entered in Block 2. In Block 1 ($F = 8.60$, $df = 5$, $p < .001$; $R^2 = 0.102$), female students, relative to males, and those who indicated not currently dating, compared to those in a steady relationship had significantly more positive attitudes toward consent ($B = 0.42$, $p < .001$ and $B = 0.23$, $p = 0.009$, respectively). In addition, students who indicated participating in campus athletic sports had significantly less positive attitudes ($B = -1.10$, $p = 0.002$). In Block 2 ($F = 30.44$, $df = 5$, $p < .001$; $R^2 = 0.224$) the relationship between sports participation and attitude became non-significant. As expected, endorsement of unhealthy consent scripts involving alcohol was significantly and negatively related to attitude toward establishing consent ($B = -0.09$, $p < .001$). The model in Block 2 explained 32.6% of the variance in students' attitudes toward consent ($R^2 = 0.326$). That is, students' endorsement of alcohol-involved consent scripts, gender identity and relationship status together accounted for approximately

one third of the variation in their consent attitudes, while endorsement of consent scripts uniquely explained 22.4% of the variation in consent attitudes.

Discussion

The present study investigated the relationship between students' endorsement of alcohol-involved consent scripts and attitude toward establishing sexual consent among undergraduate students. Consistent with the hypothesis, students with higher level of acceptance of alcohol-involved scripts had less positive attitude toward ascertaining consent. There were also significant differences in attitude based on gender identity (with more positive attitude among female students, compared to males) and relationship status (with more positive attitude among those who are not dating, relative to those in steady relationship).

While no past published research that examined the relationship between alcohol-involved consent scripts and consent attitudes could be identified, the findings from this study do align with other studies that focused on other sexual and gender scripts commonly held by college students. For example, adherence to rape myths and masculine norms are found to negatively impact students' understanding of sexual consent (Warren et al., 2015). Traditional scripts also operate in students' interpretations of alcohol consumption and sexual consent. For example, some students perceive women who accept drinks as consenting to sex (Jozkowski et al., 2017; Jozkowski et al., 2018) or that men are "owed" sex for having bought drinks (Jozkowski et al., 2017). Such beliefs are in line with rape myths, which seek to justify sexual violence – e.g., blaming the victim for drinking in an incident of sexual violence (Payne et al., 1994). There is also evidence that shows college students

endorse sex-related alcohol expectancies while drinking (e.g., expecting that drinking would result in better sex; LaBrie et al., 2011); however, alcohol consumption prior to a sexual activity is related to lower inner consent (e.g., safety, comfort, readiness; Jozkowski & Wiersma, 2015). Taken together, there appears to be an intricate interplay between endorsement of scripts, consent norms and college drinking culture that can create an environment for sexual assault or minimization of assault incidents to occur.

Acceptance of sexual and gender scripts and norms take root as part of one's socialization and the scripts dictate the person's behaviors and interpretations of experiences (McCormick, 2010). If this is the case, then, campus sexual violence prevention efforts will need to encompass strategies for broader cultural shift, in addition to offering information-based consent education. Indeed, it highly important that college students know what constitutes consent and what their respective campus policies state, and researchers have noted that students are generally aware of consent and ways to communicate consent/non-consent (Beres, 2014; Fenner, 2018). While there may be differences in how consent is communicated (e.g., with respect gender and relationship length; Humphreys, 2007), miscommunication of consent/nonconsent is not the primary cause of sexual violence incidents (Beres, 2010; Jozkowski & Humphreys, 2014). A systematic review of the literature shows that the risk factors of sexual violence perpetration are multi-layered including cognitive factors such as acceptance of rape myths, adherence to traditional gender roles, attitudes supportive of hypermasculinity, attitudes of dominance, and hostility towards women, and peer-level social norms such as peer sexual attitudes (Tharp et

al., 2013). Therefore, it is imperative that the focus of future campus education efforts tackle socially relevant cognitive and peer factors. The urgency for rethinking the focus of sexual violence prevention efforts is further underscored by the fact that sexual violence prevalence rates have not declined over the last few decades (Fisher et al., 1999; Rosenberg et al., 2019). A systematic review of 140 outcome evaluations suggested that existing sexual violence prevention interventions, by large, are not making a difference in terms of sexual violence perpetration (DeGue et al., 2014). This review found that only less than 10% the interventions included contents targeting social norms and peer attitudes. In addition, the majority of the programs were implemented in one session and lasted one hour or less (DeGue et al., 2014), while there is evidence indicating that longer-term exposure might be more effective (Jozkowski, 2015). Furthermore, many sexual violence prevention programs were devoid of theoretical foundation (DeGue et al., 2014). The use of behavioral change theories in developing, implementing and evaluating sexual violence interventions is needed to get desired behavioral impacts (Paul & Gray, 2011). Lastly, the majority of interventions lack rigorous evaluation strategies to assess impacts on sexual violence perpetration (DeGue et al., 2014).

In sum, current sexual violence prevention programs are in need of shift in emphasis and strategy in order to impact attitudes and behaviors. The findings from this study supports expansion of future intervention contents to include culturally pertinent cognitive factors such as alcohol-involved consent scripts as a way to influence consent attitudes. Additionally, recognizing the role of identities (e.g., gender) in approaches to interpersonal interactions may be important – in this case

students' feelings about establishing consent. An approach that may be useful for campuses to consider in designing sexual violence prevention programs is the "power-conscious framework" (Linder, 2018). Linder's (2018) "power-conscious framework" calls for nuanced strategies that take into account students' needs and interpersonal experiences with respect to identity (such as gender) and power in creating awareness about sexual violence, in prevention efforts and response procedures. The strategies include reflecting on context and history pertinent to the issue, clearly identifying the role of power and dominant groups, and working in solidarity to address the issue (Linder, 2018).

A limitation to this study is possible social desirability bias with respect to self-reported levels of endorsement of alcohol-involved consent scripts as well as attitude toward establishing sexual consent. Also, the sample may not be representative of the undergraduate student body as freshmen was excluded from the study. In addition, this was a cross-sectional study and the findings do not support causal relationships. Future intervention research should investigate consent scripts and additional contextual modifiable variables identified in the literature as risk factors for sexual violence perpetration (e.g., rape myth acceptance, peer social norms; Tharp et al., 2013) and the longitudinal relationships to consent attitudes and perpetration behaviors.

In line with studies that emphasized the importance of recognizing cognitive narratives that contribute to sexual assault (e.g., Jozkowski, 2015), this study furthers the research literature by identifying the unique explanatory power of acceptance of alcohol-involved consent scripts in predicting students' consent attitudes. The

findings also support the call by researchers for future interventions to be inclusive of contextual variables associated with sexual perpetration (e.g., Jozkowski et al., 2015; Lonsway et al., 1998). Allocation of resources may be needed to design, implement and evaluate comprehensive, theory-driven and power-conscious sexual violence prevention initiatives on campuses. Earlier interventions may be needed as well, since some social and culture factors may take root before students get to college or university (DeGue et al., 2014). What is evident is moving the needle on reducing sexual violence will require revamping prevention efforts to recognize and address the social, cultural and power contexts in which sexual violence occurs.

Chapter 5: Summary, Implications and Conclusions

Sexual violence is a pervasive public health problem with significant immediate and long-lasting consequences to well-being. Defined as “sexual activity where consent is not obtained or freely given” (CDC, 2022), it includes attempted and completed rape, sexual assault, and sexual harassment (CDC, 2016; NIJ, 2017). A population that experiences the highest rates of sexual victimization is college age groups, particularly females aged 18-24 (CDC, 2014; Sinozich et al., 2014). A recent systematic review of U.S. campus surveys administered between 2010 and 2016 found a prevalence rate of 20.4% among female undergraduate students and 4.9% among male students (Rosenberg et al., 2019). Alarming, the prevalence rates have stayed similar over the last few decades. A study conducted over 20 years ago (involving 233 institutions of higher education) had found that 15.5% of female students had experienced one form of sexual victimization (Fisher et al., 1999). Sexual coercion (“obtaining sexual acts through verbal pressure or manipulation or through use of older age or positions of authority;” Strang et al., 2013) is one of the most commonly reported incidents by college students (Fedina et al., 2018; Struckman-Johnson et al., 2003). In particular, verbal pressure after sexual advance is refused is a common form of sexual coercion (Struckman-Johnson et al., 2003).

Institutional response to sexual violence has seen significant changes with the help of legislative reforms and efforts by students and advocates. Institutions created Title IX offices on campus, developed policies with definitions of sexual consent, and established incident reporting procedures (Holland & Cortina, 2017). Currently, over

90% of colleges and universities have published their policies online with about 88% providing sexual consent definitions (Graham et al., 2017).

Institutions also require their students to complete sexual violence prevention trainings. In many of such trainings, sexual consent takes a central role (Fenner, 2018; Jozkowski, 2015). For example, at UMD, all first-year students are required to complete a sexual assault prevention program which focuses on “definitions of sexual harassment and assault, and building consent, and bystander intervention skills” (UMD Office of Civil Rights & Sexual Misconduct Available Courses). Despite the legislative and institutional efforts, sexual violence continues to be a significant problem on campuses. The literature on factors influencing students’ perceptions about consent and coercion suggests that gender, relationship history or stereotypical gendered beliefs are significant predictors (Eaton & Matamala, 2014; Humphreys, 2007). There has also been a call by researchers to better understand the cognitive and social contexts in which sexual violence occurs in order to shift attitudes and behaviors (e.g., Hirsch et al., 2019; Jozkowski et al., 2015). This dissertation research, comprised of two studies, investigated specific contextual and individual-level factors that can explain students’ understanding of consent-seeking and coercive behaviors and attitudes towards seeking consent. The focus on consent-seeking and coercion is purposeful as these are two of the consent standards embedded in UMD’s as well as many other campus policies (namely, establishing consent is the responsibility of the party who wants to engage in sexual activity, and it should be free of coercion).

Study 1 was a factorial survey experiment that investigated the predictive effects of alcohol, relationship type and spatial factors on students' interpretations of consent-seeking and coercive behaviors in hypothetical vignette scenarios. The vignettes described a sexual encounter between two college students and had the vignette factors embedded in them (i.e., the independent variables: level of intoxication – sober/drunk; type of relationship – casual/committed; place of intimate encounter– sexual initiator's/partner's residence). Students scored the vignettes on a scale ranging from 1-strongly disagree to 7-strongly agree to indicate their level of agreement whether i) consent was sought by the sexual initiator and ii) there was no coercion from the initiator. The effects of respondent-level variables were also investigated (gender, endorsement of consent scripts, attitude towards establishing consent, history of sexual victimization). Mixed models were used to assess the predictive effects of the vignette factors as well as the respondent-level variables on the outcomes (consent was sought by initiator, and there was no coercion from the initiator). The selection of the vignette factors – alcohol, relationship type, physical space – is based on their relevance in understanding the social environment and power differentials in which sexual violence occurs (Hirsch & Khan, 2020) as well as campus consent policies and state-level consent laws. Specifically, incapacitation is clearly addressed in many campus policies as well as criminal laws. For example, Maryland's consent laws address sexual activity with an individual who is mentally incapacitated "because of the influence of a drug, narcotic, or intoxicating substances, or because of an act committed on the individual without the individual's consent or awareness" as nonconsensual (RAINN: Consent Laws – Maryland).

Study 2, which used survey data from Study 1, examined students' endorsement of consent scripts specifically *when* drinking is involved and *how* these scripts relate to their attitude towards ascertaining sexual consent. Endorsement of alcohol-involved consent scripts was measured by the Campus Beliefs and Myths scale and included beliefs that equate drinking with consenting to sex or that a drunk person can still give consent (Ward et al., 2012).

The results from Study 1 showed that the vignettes where the individuals were described as drunk received lower rating (on a scale ranging from strongly disagree to strongly agree) for the initiator's consent seeking behaviors, compared to the vignettes describing the individuals as sober; it appears that students were aware that individuals incapacitated mentally from alcohol, as depicted in the vignette scenarios, cannot consent. Similarly, the vignettes depicting casual relationship were, on average, scored lower for the initiator's consent-seeking, compared to the vignettes describing exclusive, committed relationship. These findings suggest that level of intoxication and type of relationship significantly predicted students' ratings of sexual initiator's consent seeking behaviors. The vignettes describing verbal consent-seeking received higher ratings, on average, compared to the vignettes describing nonverbal consent-seeking. Another important finding was that male students indicated higher level of agreement that the sexual initiator sought consent. For the second outcome (whether the sexual initiator's behavior was free from coercion), the vignettes where the initiator used repeated questioning after partner's non-consent received higher ratings, on average. One of the practical implications of the study findings is that campus sexual violence prevention efforts should incorporate specific discussions

around how alcohol and type of relationship may shape students' views of consent and consent-seeking behaviors. Prevention initiatives should also recognize and address the apparent gender differences in interpreting consent-seeking behaviors. In addition, campus education initiatives should place greater emphasis on verbal sexual coercion as past research has shown while is highly prevalent among college students (Struckman-Johnson et al., 2003), it may not necessarily be viewed by students as a form of sexual aggression (e.g., Eaton & Matamala, 2014). Study 1 also showed that cognitive variables such as endorsement of alcohol-related consent scripts and attitude toward establishing consent were significantly related to students' assessment of consent-seeking and coercive behaviors. Future sexual violence prevention interventions should consider targeting these cognitive factors and evaluate the impacts not only on college students' interpretations of consent and coercion but behaviors as well.

The findings from Study 2 showed that students with higher level of acceptance of alcohol-involved scripts reported less positive attitude toward ascertaining consent with their partner. There were also significant differences in attitudes based on gender identity (with more positive attitudes toward ascertaining consent among female students, compared to males) and relationship status (with more positive attitudes toward consent seeking among students who were not in a dating relationship, relative to those in a steady relationship). In line with studies that emphasized the importance of recognizing cognitive narratives that contribute to sexual assault (e.g., Jozkowski, 2015), this study furthers the research literature by

identifying the unique explanatory power of acceptance of alcohol-involved consent scripts in predicting students' consent attitudes.

This dissertation research had limitations including the non-representativeness of the sample. The eligibility criteria for participating in the study were being an undergraduate student and having been at the university for at least two full semesters. The latter criterion ensured that participating students have taken the initial mandatory sexual misconduct prevention training for first-year students [This initial training covers consent definitions (UMD Office of Civil Rights & Sexual Misconduct Available Courses)]. The study sample was primarily comprised of sophomores and upper level students. It is possible that the results could be different if the freshman class was included, especially if they have not yet received the mandatory training but also because the risks for sexual victimization are greater for students that are newer to campus (i.e., freshmen) than juniors and seniors (Krebs et al., 2007). Another limitation of this study is potential social desirability bias in students' responses for the vignette evaluations or the scales measuring consent attitudes and endorsement of consent scripts. Vignettes enable researchers to investigate sensitive topics [e.g., rape and victim blaming (Furnham & Boston, 1996)] or topics that generally may be prone to socially acceptable responses (Ganong & Coleman, 2006; Hughes & Huby, 2004). As such, the use of vignettes in this study was advantageous. However, it is still possible that there may have been bias in the vignette responses or the ratings of the scale measures. An additional limitation to Study 1, in particular, was related to the omission of potentially important vignette factors. Grounding the development of the vignettes in the literature, and then using

cognitive interviews to refine them, resulted a set of final vignettes that closely follow real-world experiences. While this allowed respondents to have clear understanding of the situations, without having to fill in any missing parts, it is possible that there were relevant vignette factors that were not accounted in Study 1 (e.g., *length* of relationship). In Study 2, the results should be interpreted with caution as they do not support causality. In addition, social desirability bias could be present in this study as well.

Despite these limitations, there were several strengths to this dissertation research. Study 1 utilized a factorial survey experiment that allowed simultaneous examination of different combinations of factor levels. The *experimental* design refers to the selection of experiments (i.e., vignettes in this case; Auspurg & Hinz, 2015). Selection of 4 subsets of 6 vignettes using D-optimal was another strength of Study 1. With D-optimal, the vignette population is partitioned into subsets that can produce unbiased and precise/efficient parameter estimates for variables of interest, while the entire vignette population is exhaustively evaluated by the full study sample (Auspurg and Hinz, 2015). Additionally, the selection of 4 sets of 6 vignettes meant a relatively small number of vignette samples per respondent, thus, minimizing the risk of “cognitive fatigue” that could be a threat to internal validity (Auspurg & Hinz, 2015). Furthermore, the use of cognitive interviewing in Study 1, to ensure vignette elements reflected the focus of the dissertation, was crucial in establishing construct validity in a vignette-based research (Trochim et al., 2016). The strength of Study 2 is in providing seminal evidence on the relationship between acceptance of alcohol-related consent myths and consent-seeking attitudes and in supporting the call by

researchers to better understand the cognitive and social contexts in which sexual violence occurs (e.g., Hirsch et al., 2019; Jozkowski et al., 2015; Lonsway et al., 1998).

The Violence Against Women Act (VAWA), a momentous legislation that seeks to improve legal, institutional and community responses to sexual violence, require that “primary prevention and awareness program” must be offered to new students and that the programs should include consent definitions (American Council on Education; ACE). VAWA also requires “on-going prevention and awareness campaigns” (ACE). The results from this dissertation support on-going intervention efforts by college and university campuses, with particular emphasis on social and cultural contributors to sexual violence perpetration. Institutions of higher education should recognize contextual factors that are relevant to the occurrence of sexual violence and to revamp their prevention strategies. The short and information-driven prevention education trainings that many institutions are implementing (DeGue et al., 2014; Jozkowski et al., 2015) may not be adequate to tackle the campus sexual violence crisis effectively. Campus sexual violence prevention trainings should be intentional in addressing social contexts and employing rigorous evaluation research to determine impacts on consent attitudes and behaviors.

Appendices

Appendix A: Cognitive Interview Guide

Section I: Introduction

THANK YOU FOR YOUR TIME AND FOR AGREEING TO PARTICIPATE IN THIS INTERVIEW FOR DISSERTATION RESEARCH. THE PURPOSE OF THE RESEARCH IS TO ASSESS HOW UNDERGRADUATE STUDENTSS INTERPRET CONSENT IN HYPOTHETICAL ROMANTIC RELATIONSHIP SCENARIOS. WITH THIS INTERVIEW, THE GOAL IS TO DETERMINE IF THE HYPOTHETICAL SCENARIOS ARE INTERPRETED AS INTENDED, BEFORE LAUNCHING THE MAIN STUDY. YOUR RESPONSES WILL BE VALUABLE AND STRENGTHEN THIS DISSERTATION RESEARCH.

BEFORE WE START, WOULD IT BE OK TO RECORD THE SESSION?

[EMAIL STUDENT THE LINK TO THE CONSENT FORM AND THE VIGNETTES] I WILL NOW SEND YOU A LINK TO THE CONSENT FORM. AS YOU READ THROUGH IT, PLEASE LET ME KNOW IF YOU HAVE ANY QUESTIONS. PLEASE KNOW THAT THERE ARE NO RIGHT OR WRONG ANSWERS, AND YOUR RESPONSES WILL BE KEPT COMPLETELY CONFIDENTIAL. AND LET ME KNOW ONCE YOU SIGN AND SUBMIT THE CONSENT FORM.

[AFTER RECEIPT OF SIGNED CONSENT FORM] BEFORE WE START THE INTERVIEW, PLEASE LET ME KNOW OF A PSEUDONYM WE CAN USE IN PLACE OF YOUR REAL NAME. YOUR REAL NAME WILL NOT BE LINKED TO YOUR RESPONSES TO THIS INTERVIEW.

NOW, PLEASE CLICK ON THE NEXT PAGE ON THE LINK AND YOU WILL SEE THE FIRST OF FOUR VIGNETTE SCENARIOS. PLEASE TAKE SOME TIME TO READ WHAT IS ON THE FIRST PAGE AND LET ME KNOW WHEN DONE.

NOW THAT YOU HAVE READ THE FIRST SCENARIO, I WOULD LIKE TO ASK YOU ABOUT YOUR UNDERSTANDING OF THE SCENARIO. JUST A REMINDER THAT YOU CAN SKIP ANY QUESTIONS YOU DO NOT WANT TO ANSWER AND CAN STOP THIS INTERVIEW AT ANY POINT, IF YOU CHOOSE TO DO SO. AND THERE ARE NO RIGHT OR WRONG ANSWERS. ANY QUESTIONS AT THIS POINT?

Section II: Assessing the meaning of vignette scenarios

No.	Questions	Interview Responses
1	<u>Scenario #1:</u> (Austen) and (Dakota) are college students who are (in a dating relationship and have been going out together). Last week, they were hanging out and having drinks at (Austen)'s apartment. They both were (sober) when (Austen) leaned in and kissed (Dakota). (Dakota) did not feel like starting anything sexual and moved away in hesitation.	

	(Austen) proceeded to repeatedly accuse (Dakota) of leading them on. In the end, they ended up having sex. What is this scenario about? What, if anything, is confusing or difficult to understand about the scenario? Who do you think is the sexual initiator in this scenario? Why do you think so? Can you state the gender of the sexual initiator? Why do you think so? What do you think the gender of the other person is? Why do you think so? Would you say the behaviors of both individuals indicate consent to sexual activity? Why? Do you see any red flags or have any concerns about the interactions between the two individuals in the scenario? Please explain. Do you perceive verbal coercion in the scenario? Please explain. [If the interviewee does not view the scenario as coercive] What would have to change in the scenario for you to view it as verbally coercive? [Manipulating type of relationship] Would your answers change if the individuals were in <i>in a committed, exclusive relationship</i>? How about if they were <i>involved sexually without expectations of commitment</i>? In your opinion, how do these types of relationships differ? Do you think this scenario is realistic?	
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2	NOW, PLEASE TAKE TIME TO READ THROUGH THE SECOND NARRATIVE SCENARIO IN QUALTRICS. <u>Scenario #2:</u> It has been a few months since two undergraduate students, (<i>Emory</i>) and (<i>Berkley</i>), started (<i>a committed, exclusive relationship</i>). A couple of weeks ago, they spent the day at (<i>Berkley</i>)’s apartment watching movies and having drinks. They both were (<i>drunk</i>). At one point, while they were sitting on the couch, (<i>Berkley</i>) moved closer and put both arms around and kissed (<i>Emory</i>). When (<i>Emory</i>) slowly pushed away (<i>Berkley</i>)’s arms and continued watching the movie, (<i>Berkley</i>) repeatedly questioned their relationship. (<i>Emory</i>) explained that they just wanted to watch the movie and are not interested in having sex, but (<i>Berkley</i>) was not pleased. In the end, they ended up having sex. What is this scenario about? What, if anything, is confusing or difficult to understand about the scenario? Who do you think is the sexual initiator in this scenario? Why do you think so? Can you state the gender of the sexual initiator? Why do you think so? What do you think the gender of the other person is? Why do you think so? Would you say the behaviors of both individuals indicate consent to sexual activity? Why? Do you see any red flags or have any concerns about the interactions between the two individuals in the scenario? Please explain.	
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	Do you perceive verbal coercion in the scenario? Please explain. [If the interviewee does not view the scenario as coercive] What would have to change in the scenario for you to view it as verbally coercive? [Manipulating level of intoxication] Would your answers change if the individuals were <i>sober</i>? Do you think this scenario is realistic?	
3	NOW, PLEASE TAKE TIME TO READ THROUGH THE THIRD NARRATIVE SCENARIO IN QUALTRICS. <u>Scenario #3:</u> <i>(Blair)</i> and <i>(Jamie)</i> have been <i>(involved sexually without expectations of commitment)</i> since starting college last semester. On weekends, they usually get together at <i>(Blair)</i>'s or <i>(Jamie)</i>'s apartment and order in food and watch shows. Last month, they were hanging out at <i>(Jamie)</i>'s apartment. They spent the day watching shows and having drinks. They both were <i>(sober)</i>. At one point, <i>(Jamie)</i> pulled <i>(Blair)</i> closer and put both arms around <i>(Blair)</i>. <i>(Jamie)</i> asked if <i>(Blair)</i> wants to have sex, and <i>(Blair)</i> said no. <i>(Jamie)</i> was irritated and warned <i>(Blair)</i> that they could stop seeing each other. In the end, they ended up having sex. What is this scenario about? What, if anything, is confusing or difficult to understand about the scenario? Who do you think is the sexual initiator in this scenario? Why do you think so? Can you state the gender of the sexual initiator? Why do you think so?	

	What do you think the gender of the other person is? Why do you think so? Would you say the behaviors of both individuals indicate consent to sexual activity? Why? Do you see any red flags or have any concerns about the interactions between the two individuals in the scenario? Please explain. Do you perceive verbal coercion in the scenario? Please explain. [If the interviewee does not view the scenario as coercive] What would have to change in the scenario for you to view it as verbally coercive? [Manipulating place of encounter] Would your answers change if the event had occurred at a different place? Do you think this scenario is realistic?	
4	NOW, PLEASE TAKE SOME TIME TO READ THROUGH THE FORTH NARRATIVE SCENARIO IN QUALTRICS. <u>Scenario #4 (gender specific scenario):</u> <i>(Allen) and (Mary) are college students who are (in a dating relationship and have been going out together/in a committed, exclusive relationship/involved sexually without expectations of commitment) for a couple of months. Last week, they were hanging out and having drinks at (Allen)'s apartment. They both were (drunk) when (Allen) leaned in and kissed (Mary). (Mary) did not feel like starting anything sexual and moved away in hesitation. (Allen) proceeded to repeatedly accuse (Mary) of leading them on. In the end, they ended up having sex.</i>	

	What do you think the gender of the two individuals is? Why do you think so? Do you see any red flags or have any concerns about the interactions between the two individuals in the scenario? Please explain.	
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Section III: Assessing the meaning of vignette items and students' comfort level answering the items

NOW, PLEASE READ THE FIRST SCENARIO AGAIN AND RATE IT ON A SERIES OF STATEMENTS USING A SCALE RANGING FROM STRONGLY DISAGREE TO STRONGLY AGREE. THEN, I WILL ASK YOU WHAT THOSE STATEMENTS MEANT TO YOU.

Vignette scenario #1: (*Austen*) and (*Dakota*) are college students who are (*in a dating relationship and have been going out together*). Last week, they were hanging out and having drinks at (*Austen*)'s apartment. They both were (*sober*) when (*Austen*) leaned in and kissed (*Dakota*). (*Dakota*) did not feel like starting anything sexual and moved away in hesitation. (*Austen*) proceeded to repeatedly accuse (*Dakota*) of leading them on. In the end, they ended up having sex.

No.	Questions	Interview Responses
5	<u>Item #1 for assessing consent seeking behaviors</u> - Consent was sought prior to the start of sexual activity by the person who made the advance. What do you think this statement is about? If you were to repeat this statement to your friends, how would you say it?	
6	<u>Item #2 for assessing consent seeking behaviors</u> - The behaviors of both individuals indicate consent to sexual activity. What do you think this statement is about? If you were to repeat this statement to your friends, how would you say it?	
7	<u>Item #3 for assessing coercive behaviors</u>	

	- There was no verbal coercion from the person who made the sexual advance. What do you think this statement is about? If you were to repeat this statement to your friends, how would you say it?	
8	<u>Item #4 for assessing coercive behaviors</u> - The sexual advance described in the scenario was acceptable. What do you think this statement is about? If you were to repeat this statement to your friends, how would you say it?	
9	[Assessing students' comfort level answering vignette items] Which parts of the previous four statements were the most difficult to understand? In what ways? Did you find it easy or hard to rate the statements from strongly disagree to strongly agree? Can you talk about what made you say that? How comfortable did you feel rating the statements?	

OK, THIS CONCLUDES THE INTERVIEW. YOU CAN GO AHEAD AND ANSWER A FEW BACKGROUND QUESTIONS IN THE NEXT PAGE. WHEN DONE, PLEASE GO AHEAD AND CLICK THE ARROW AT THE BOTTOM OF THE PAGE TO SUBMIT.

THANK YOU AGAIN FOR YOUR TIME. I WILL NOW EMAIL YOU THE \$20 AMAZON E-GIFT CARD FOR YOUR PARTICIPATION IN TODAY'S INTERVIEW. THANKS AGAIN!

[STOP AUDIO RECORDING]

Appendix B: Vignette Survey Instrument

Thank you for your consent to participate in this survey about the students' attitudes and reaction to hypothetical scenarios. Please answer the questions carefully and honestly. Remember that your responses will be kept confidential and no one outside of the researcher will know your individual responses.

1. Age: _____
2. Month and Year of enrollment at UMD: _____
3. How do you describe your gender? (*Adapted from good practices for demographic data collection on UMD's LGBTQ+ Equity Center's website*)
 - ☐ Woman
 - ☐ Man
 - ☐ Trans Woman
 - ☐ Trans Man
 - ☐ Non-binary (neither, both, or something else)
4. Racial/ethnic background:
 - ☐ American Indian or Alaska Native
 - ☐ Asian/Asian American
 - ☐ Black or African American
 - ☐ Hispanic or Latino/a
 - ☐ Middle Eastern/North African (MENA)
 - ☐ Native Hawaiian or Other Pacific Islander
 - ☐ White/European/European American
5. Foreign student/international student status:
 - ☐ No
 - ☐ Yes
6. College class (in Spring 2021):
 - ☐ Freshman
 - ☐ Sophomore
 - ☐ Junior
 - ☐ Senior
7. Have you been at UMD for at least 2 semesters? Yes/No

8. What School/College is your degree program in?
- ☐ College of Agriculture and Natural Resources
 - ☐ School of Architecture, Planning, and Preservation
 - ☐ College of Arts and Humanities
 - ☐ College of Behavioral and Social Sciences
 - ☐ Robert H. Smith School of Business
 - ☐ College of Computer, Mathematical and Natural Sciences
 - ☐ College of Education
 - ☐ A. James Clark School of Engineering
 - ☐ Philip Merrill College of Journalism
 - ☐ College of Information Studies
 - ☐ School of Public Health
 - ☐ School of Public Policy
 - ☐ Other
9. Are you, or have you ever been, a member of a fraternity or sorority at UMD?
- ☐ No
 - ☐ Yes
10. Are you, or have you ever been, a student-athlete at UMD?
- ☐ No
 - ☐ Yes
11. Current relationship status:
- ☐ Not dating or seeing anyone
 - ☐ Dating or seeing more than one person
 - ☐ Casually dating or seeing one person
 - ☐ Steady relationship with one person only
 - ☐ Engaged, married or living with a partner

Please read the following brief narratives and respond to the questions below.

(Austen) and (Dakota) are college students who are (*in a dating relationship and have been going out together*). Last week, they were hanging out and having drinks at (Austen)'s apartment. They both were (*sober*) when (Austen) leaned in and kissed (Dakota). (Dakota) did not feel like starting anything sexual and moved away in hesitation. (Austen) proceeded to repeatedly accuse (Dakota) of leading them on. In the end, they ended up having sex.

Please rate the following statements on a scale of 1-***Strongly disagree*** to 7-***Strongly agree***.

- a. Austen sought consent prior to the start of sexual activity.
- b. There was no verbal coercion from Austen.

Please indicate your perception of the gender of the individuals in the scenario.

Austen's gender:

- ☐ Woman
- ☐ Man
- ☐ Other response: _____

Dakota's gender:

- ☐ Woman
- ☐ Man
- ☐ Other response: _____

It has been a few months since two undergraduate students, (*Emory*) and (*Berkley*), started (*a committed, exclusive relationship*). A couple of weeks ago, they spent the day at (*Berkley*)'s apartment watching movies and having drinks. They both were (*drunk*). At one point, while they were sitting on the couch, (*Berkley*) moved closer and put both arms around and kissed (*Emory*). When (*Emory*) slowly pushed away (*Berkley*)'s arms and continued watching the movie, (*Berkley*) repeatedly questioned the point of their relationship. (*Emory*) explained that they just wanted to watch the movie and are not interested in having sex, but (*Berkley*) was not pleased. In the end, they ended up having sex.

Please rate the following statements on a scale of 1-***Strongly disagree*** to 7-***Strongly agree***.

- a. Berkley sought consent prior to the start of sexual activity.
- b. There was no verbal coercion from Berkley.

Please indicate your perception of the gender of the individuals in the scenario.

Berkley's gender:

- ☐ Woman
- ☐ Man
- ☐ Other response: _____

Emory's gender:

- ☐ Woman
- ☐ Man
- ☐ Other response: _____

(*Blair*) and (*Jamie*) have been (*involved sexually without expectations of commitment*) since starting college last semester. On weekends, they usually get together at (*Blair*)'s or (*Jamie*)'s apartment and order in food and watch shows. Last month, they were hanging out at (*Jamie*)'s apartment. They spent the day watching shows and

having drinks. They both were (*sober*). At one point, (*Jamie*) pulled (*Blair*) closer and put both arms around (*Blair*). (*Jamie*) asked if (*Blair*) wants to have sex, and (*Blair*) said no. (*Jamie*) was irritated and warned (*Blair*) that they could stop seeing each other. In the end, they ended up having sex.

Please rate the following statements on a scale of 1-***Strongly disagree*** to 7-***Strongly agree***.

- a. Jamie sought consent prior to the start of sexual activity.
- b. There was no verbal coercion from Jamie.

Please indicate your perception of the gender of the individuals in the scenario.

Jamie's gender:

- ☐ Woman
- ☐ Man
- ☐ Other response: _____

Blair's gender:

- ☐ Woman
- ☐ Man
- ☐ Other response: _____

Attitude toward establishing consent (Humphreys & Brousseau, 2010): Please rate the following statements on a scale 1-***Strongly disagree*** to 7-***Strongly agree***.

1. I feel that sexual consent should always be obtained before the start of any sexual activity.
2. I believe that asking for sexual consent is in my best interest because it reduces any misinterpretations that might arise.
3. I think it is equally important to obtain sexual consent in all relationships regardless of whether or not they have had sex before.
4. I feel that verbally asking for sexual consent should occur before proceeding with any sexual activity.
5. When initiating sexual activity, I believe that one should always assume they do not have sexual consent.
6. I believe that it is just as necessary to obtain consent for genital fondling as it is for sexual intercourse.
7. Most people that I care about feel that asking for sexual consent is something I should do.
8. I think that consent should be asked before any kind of sexual behavior, including kissing or petting.
9. I feel it is the responsibility of both partners to make sure sexual consent is established before sexual activity begins.
10. Before making sexual advances, I think that one should assume "no" until there is clear indication to proceed.
11. Not asking for sexual consent some of the time is okay. [Reverse coded]

Endorsement of alcohol myths (Ward et al., 2012): Please rate the following statements on a scale 1-***strongly disagree*** to 7-***strongly agree***.

1. A person who is drinking heavily can still give legal consent to sexual activity.
2. A person who is sexually assaulted after drinking alcohol should only blame self.
3. Consensual drunk sex is a normal and harmless part of college life.
4. When a person is drinking alcohol, the person is implying interest in engaging in sexual activity.
5. If both partners are drunk and have sex, there is no way one can be accused of sexual assault or rape.
6. As a general rule, alcohol makes sexual situations easier and more enjoyable for all involved.

History of sexual victimization (Rhodes et al., 2002):

1. Have you ever been made to have sex when you did not consent to? Yes/No

Thank you for completing the survey! The following link has a list of resources including UMD reporting procedures for sexual misconduct, and information and service centers available on- and off-campus: <https://www.ocrsm.umd.edu/>
If you would like to provide your information to be entered into a raffle for a \$25 Amazon e-gift card, please click on the link below. The link will take you to a separate page, which will not be linked to your survey responses.

Appendix C: Consent Form for Cognitive Interview

CONSENT TO PARTICIPATE: VIRTUAL COGNITIVE INTERVIEW

Project Title	Assessing undergraduate students' judgement of consent seeking and coercive behaviors using a factorial vignette experiment
Purpose of the Study	This research is being conducted by Israel Abebe, MA, at the University of Maryland, College Park. You are being invited to participate in the virtual cognitive interview part of a dissertation research because you are currently enrolled in an undergraduate program at UMD. The purpose of this particular interview is to get a sense of your understanding of narrative scenarios of hypothetical intimate romantic relationships. The interview will also touch on your interpretations of scenario-based questions assessing the presence of consent and coercion in the scenarios. In addition, the interview will also cover attitudes and perspectives on consent.
The Procedures	You will be given three scenarios and questions related to these scenarios. Then, the researcher will ask a series of questions about your comprehension of, and reaction to, what you read. The interview should take about 30 minutes.
Potential Risks and Discomforts	No major risks are anticipated in participation in this study. It is important to know that all responses will not be linked to any identifying information, and you may choose to skip any question you are not comfortable answering.
Potential Benefits	There are no direct benefits to participating in this study. However, we hope that the cognitive interviews will help in the design and implementation of a robust dissertation research focused on understanding students' attitudes and perspectives on consent.
Confidentiality	Your responses will be anonymous. The interview will be audio recorded. You will be assigned a unique ID number and all data will be stored on a password-protected external hard drive dedicated to the study. No one but the research team will have access to collected data. In any reports or articles about the findings from this study, your identity will be protected to the maximum extent possible. Your contact information will be collected from you if you choose to enter a raffle to receive compensation. This information will not be linked in any way to the responses you provide on the interview.
Medical Treatment	Not applicable.
Compensation	You may choose to provide your name and email address to receive a \$20 Amazon e-gift card for participating in this interview.

Right to Withdraw and Questions	Your participation in this interview is completely voluntary. You may choose not to take part at all. If you decide to participate in this interview, you may stop participating at any time. If you decide not to participate or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify. If you decide to stop taking part in the study, if you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the investigator: Israel Abebe Shoemaker Building, #021 4281 Chapel Lane College Park, MD 20742 (301) 314-7692 iabebe@umd.edu	
Participant Rights	If you have questions about your rights as a research participant or wish to report a research-related injury, please contact: University of Maryland College Park Institutional Review Board Office 1204 Marie Mount Hall College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678 This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.	
Statement of Consent	Your signature indicates that you are 18 years or older; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction; and you voluntarily agree to participate in this research study. You will receive a copy of this signed consent form. If you agree to participate, please sign your name below.	
Signature and Date	NAME OF PARTICIPANT [Please Print]	
	SIGNATURE OF PARTICIPANT	
	DATE	

Appendix D: Consent Form for Main Survey

CONSENT TO PARTICIPATE: SURVEY

Project Title	Assessing undergraduate students' judgement of consent seeking and coercive behaviors using a factorial vignette experiment
Purpose of the Study	This research is being conducted by Israel Abebe, MA, at the University of Maryland, College Park. You are being invited to participate in this research project because you are currently enrolled in an undergraduate program at UMD. The purpose of this research is to understand factors associated with undergraduate students' perspectives of consent and coercion in narrative scenarios of hypothetical intimate romantic relationships. The study will also evaluate attitudes toward consent.
The Procedures	Participants will be asked to complete an online survey consisting of 53 questions that asks about students' attitudes and reactions to hypothetical scenarios presented in a text form. The survey should take about 20 minutes to complete.
Potential Risks and Discomforts	No major risks are anticipated in participation in this study. However, there may be some discomfort when responding to hypothetical scenarios or answering questions about attitudes. It is important to know that all responses will not be linked to any identifying information, and you may choose to skip any question you are not comfortable answering.
Potential Benefits	There are no direct benefits to participating in this study. However, we hope that the research will inform future training programs for undergraduate students on consent.
Confidentiality	Your responses will be anonymous. You will be assigned a unique ID number and all data will be stored on a password-protected external hard drive dedicated to the study. No one but the research team will have access to collected data, and once all survey responses have been collected and downloaded to a computer, all online responses will be deleted. In any reports or articles about the findings from this study, your identity will be protected to the maximum extent possible. Your contact information will be collected from you if you choose to enter a raffle to receive compensation. This information will not be linked in any way to the responses you provide on the survey.
Medical Treatment	Not applicable.
Compensation	You may choose to provide your name and email address to be entered into a raffle to win one of forty \$25 Amazon e-gift cards for participating in this study.

Right to Withdraw and Questions	Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify. If you decide to stop taking part in the study, if you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the investigator: Israel Abebe Shoemaker Building, #021 4281 Chapel Lane College Park, MD 20742 (301) 314-7692 iabebe@umd.edu	
Participant Rights	If you have questions about your rights as a research participant or wish to report a research-related injury, please contact: University of Maryland College Park Institutional Review Board Office 1204 Marie Mount Hall College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678 This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.	
Statement of Consent	Your signature indicates that you are 18 years or older; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction; and you voluntarily agree to participate in this research study. You can save or print a copy of this signed consent form. If you agree to participate, please sign your name below.	
Signature and Date	NAME OF PARTICIPANT [Please Print]	
	SIGNATURE OF PARTICIPANT	
	DATE	

Appendix E: Participant Recruitment Announcements

Cognitive Interview Participant Recruitment for Undergraduates

For Dissertation Research

- ✓ Seeking participants to share their opinions about hypothetical scenarios (vignettes) in virtual interviews on Zoom
- ✓ To participate, you must: be age 18 or older, be a UMD student, and have completed at least one year of undergraduate program at UMD
- ✓ Participants will receive a **\$20 Amazon e-gift card** for participating in the interview that will be about 30 minutes

If you are interested, please contact Israel Abebe at iabebe@umd.edu

Survey Participant Recruitment for Undergraduates

For Dissertation Research

- ✓ Seeking participants to participate in a survey study about students' attitudes and opinions about hypothetical scenarios (vignettes)
- ✓ To participate, you must: be age 18 or older, be a UMD student, and have completed at least one year of undergraduate program at UMD
- ✓ Participants will receive a **\$25 Amazon e-gift card** for completing the survey that will be about 20 minutes

If you are interested, please contact Israel Abebe at iabebe@umd.edu

Appendix F: Vignette Population

Set 1

#1 Austen and Dakota are college students who have been going out together without any expectations of commitment. Last week, they were hanging out and having drinks at Austen's apartment. They both were drunk when Austen leaned in and kissed Dakota. Dakota did not feel like starting anything sexual and moved away in hesitation. Austen proceeded to repeatedly accuse Dakota of leading them on. In the end, they ended up having sex.

#8 Drew and Eden are college students who are in a committed, exclusive relationship. Last week, they were hanging out and having drinks at Eden's apartment. They both were sober when Drew leaned in and kissed Eden. Eden did not feel like starting anything sexual and moved away in hesitation. Drew proceeded to repeatedly accuse Eden of leading them on. In the end, they ended up having sex.

#11 It has been a few months since two undergraduate students, Emory and Berkley, started a committed, exclusive relationship. A couple of weeks ago, they spent the day at Berkley's apartment watching movies and having drinks. They both were drunk. At one point, while they were sitting on the couch, Berkley moved closer and put both arms around and kissed Emory. When Emory slowly pushed away Berkley's arms and continued watching the movie, Berkley repeatedly questioned why they were together. Emory explained that they just wanted to watch the movie and are not interested in having sex, but Berkley was not pleased. In the end, they ended up having sex.

#14 It has been a few months since two undergraduate students, Jordan and Riley, started going out together without any expectations of commitment. A couple of weeks ago, they spent the day at Jordan's apartment watching movies and having drinks. They both were sober. At one point, while they were sitting on the couch, Riley moved closer and put both arms around and kissed Jordan. When Jordan slowly pushed away Riley's arms and continued watching the movie, Riley repeatedly questioned why they were together. Jordan explained that they just wanted to watch the movie and are not interested in having sex, but Riley was not pleased. In the end, they ended up having sex.

#20 Blair and Jamie have been in a committed, exclusive relationship since starting college last semester. On weekends, they usually get together at Blair's or Jamie's apartment and order in food and watch shows. Last month, they were hanging out at Jamie's apartment. They spent the day watching shows and having drinks. They both were sober. At one point, Jamie pulled Blair closer and put both arms around Blair. Jamie asked if Blair wanted to have sex, and Blair said no. Jamie was irritated and warned Blair that they could stop seeing each other. In the end, they ended up having sex.

#21 Jesse and Casey have been going out together without any expectations of commitment since starting college last semester. On weekends, they usually get together at Jesse's or Casey's apartment and order in food and watch shows. Last month, they were hanging out at Jesse's apartment. They spent the day watching shows and having drinks. They both were drunk. At one point, Casey pulled Jesse closer and put both arms around Jesse. Casey asked if Jesse wanted to have sex, and Jesse said no. Casey was irritated and warned Jesse that they could stop seeing each other. In the end, they ended up having sex.

Set 2

#2 Austen and Dakota are college students who have been going out together without any expectations of commitment. Last week, they were hanging out and having drinks at Austen's apartment. They both were sober when Austen leaned in and kissed Dakota. Dakota did not feel like starting anything sexual and moved away in hesitation. Austen proceeded to repeatedly accuse Dakota of leading them on. In the end, they ended up having sex.

#7 Drew and Eden are college students who are in a committed, exclusive relationship. Last week, they were hanging out and having drinks at Eden's apartment. They both were drunk when Drew leaned in and kissed Eden. Eden did not feel like starting anything sexual and moved away in hesitation. Drew proceeded to repeatedly accuse Eden of leading them on. In the end, they ended up having sex.

#9 It has been a few months since two undergraduate students, Emory and Berkley, started going out together without any expectations of commitment. A couple of weeks ago, they spent the day at Berkley's apartment watching movies and having drinks. They both were drunk. At one point, while they were sitting on the couch, Berkley moved closer and put both arms around and kissed Emory. When Emory slowly pushed away Berkley's arms and continued watching the movie, Berkley repeatedly questioned why they were together. Emory explained that they just wanted to watch the movie and are not interested in having sex, but Berkley was not pleased. In the end, they ended up having sex.

#16 It has been a few months since two undergraduate students, Jordan and Riley, started a committed, exclusive relationship. A couple of weeks ago, they spent the day at Jordan's apartment watching movies and having drinks. They both were sober. At one point, while they were sitting on the couch, Riley moved closer and put both arms around and kissed Jordan. When Jordan slowly pushed away Riley's arms and continued watching the movie, Riley repeatedly questioned why they were together. Jordan explained that they just wanted to watch the movie and are not interested in having sex, but Riley was not pleased. In the end, they ended up having sex.

#19 Blair and Jamie have been in a committed, exclusive relationship since starting college last semester. On weekends, they usually get together at Blair's or Jamie's apartment and order in food and watch shows. Last month, they were hanging out at

Jamie's apartment. They spent the day watching shows and having drinks. They both were drunk. At one point, Jamie pulled Blair closer and put both arms around Blair. Jamie asked if Blair wanted to have sex, and Blair said no. Jamie was irritated and warned Blair that they could stop seeing each other. In the end, they ended up having sex.

#22 Jesse and Casey have been going out together without any expectations of commitment since starting college last semester. On weekends, they usually get together at Jesse's or Casey's apartment and order in food and watch shows. Last month, they were hanging out at Jesse's apartment. They spent the day watching shows and having drinks. They both were sober. At one point, Casey pulled Jesse closer and put both arms around Jesse. Casey asked if Jesse wanted to have sex, and Jesse said no. Casey was irritated and warned Jesse that they could stop seeing each other. In the end, they ended up having sex.

Set 3

#3 Austen and Dakota are college students who are in a committed, exclusive relationship. Last week, they were hanging out and having drinks at Austen's apartment. They both were drunk when Austen leaned in and kissed Dakota. Dakota did not feel like starting anything sexual and moved away in hesitation. Austen proceeded to repeatedly accuse Dakota of leading them on. In the end, they ended up having sex.

#6 Drew and Eden are college students who have been going out together without any expectations of commitment. Last week, they were hanging out and having drinks at Eden's apartment. They both were sober when Drew leaned in and kissed Eden. Eden did not feel like starting anything sexual and moved away in hesitation. Drew proceeded to repeatedly accuse Eden of leading them on. In the end, they ended up having sex.

#12 It has been a few months since two undergraduate students, Emory and Berkley, started a committed, exclusive relationship. A couple of weeks ago, they spent the day at Berkley's apartment watching movies and having drinks. They both were sober. At one point, while they were sitting on the couch, Berkley moved closer and put both arms around and kissed Emory. When Emory slowly pushed away Berkley's arms and continued watching the movie, Berkley repeatedly questioned their relationship. Emory explained that they just wanted to watch the movie and are not interested in having sex, but Berkley was not pleased. In the end, they ended up having sex.

#13 It has been a few months since two undergraduate students, Jordan and Riley, started going out together without any expectations of commitment. A couple of weeks ago, they spent the day at Jordan's apartment watching movies and having drinks. They both were drunk. At one point, while they were sitting on the couch, Riley moved closer and put both arms around and kissed Jordan. When Jordan slowly

pushed away Riley's arms and continued watching the movie, Riley repeatedly questioned why they were together. Jordan explained that they just wanted to watch the movie and are not interested in having sex, but Riley was not pleased. In the end, they ended up having sex.

#18 Blair and Jamie have been going out together without any expectations of commitment since starting college last semester. On weekends, they usually get together at Blair's or Jamie's apartment and order in food and watch shows. Last month, they were hanging out at Jamie's apartment. They spent the day watching shows and having drinks. They both were sober. At one point, Jamie pulled Blair closer and put both arms around Blair. Jamie asked if Blair wanted to have sex, and Blair said no. Jamie was irritated and warned Blair that they could stop seeing each other. In the end, they ended up having sex.

#23 Jesse and Casey have been in a committed, exclusive relationship since starting college last semester. On weekends, they usually get together at Jesse's or Casey's apartment and order in food and watch shows. Last month, they were hanging out at Jesse's apartment. They spent the day watching shows and having drinks. They both were drunk. At one point, Casey pulled Jesse closer and put both arms around Jesse. Casey asked if Jesse wanted to have sex, and Jesse said no. Casey was irritated and warned Jesse that they could stop seeing each other. In the end, they ended up having sex.

Set 4

#4 Austen and Dakota are college students who are in a committed, exclusive relationship. Last week, they were hanging out and having drinks at Austen's apartment. They both were sober when Austen leaned in and kissed Dakota. Dakota did not feel like starting anything sexual and moved away in hesitation. Austen proceeded to repeatedly accuse Dakota of leading them on. In the end, they ended up having sex.

#5 Drew and Eden are college students who have been going out together without any expectations of commitment. Last week, they were hanging out and having drinks at Eden's apartment. They both were drunk when Drew leaned in and kissed Eden. Eden did not feel like starting anything sexual and moved away in hesitation. Drew proceeded to repeatedly accuse Eden of leading them on. In the end, they ended up having sex.

#10 It has been a few months since two undergraduate students, Emory and Berkley, started going out together without any expectations of commitment. A couple of weeks ago, they spent the day at Berkley's apartment watching movies and having drinks. They both were sober. At one point, while they were sitting on the couch, Berkley moved closer and put both arms around and kissed Emory. When Emory slowly pushed away Berkley's arms and continued watching the movie, Berkley repeatedly questioned why they were together. Emory explained that they just wanted

to watch the movie and are not interested in having sex, but Berkley was not pleased. In the end, they ended up having sex.

#15 It has been a few months since two undergraduate students, Jordan and Riley, started a committed, exclusive relationship. A couple of weeks ago, they spent the day at Jordan's apartment watching movies and having drinks. They both were drunk. At one point, while they were sitting on the couch, Riley moved closer and put both arms around and kissed Jordan. When Jordan slowly pushed away Riley's arms and continued watching the movie, Riley repeatedly questioned their relationship. Jordan explained that they just wanted to watch the movie and are not interested in having sex, but Riley was not pleased. In the end, they ended up having sex.

#17 Blair and Jamie have been going out together without any expectations of commitment since starting college last semester. On weekends, they usually get together at Blair's or Jamie's apartment and order in food and watch shows. Last month, they were hanging out at Jamie's apartment. They spent the day watching shows and having drinks. They both were drunk. At one point, Jamie pulled Blair closer and put both arms around Blair. Jamie asked if Blair wanted to have sex, and Blair said no. Jamie was irritated and warned Blair that they could stop seeing each other. In the end, they ended up having sex.

#24 Jesse and Casey have been in a committed, exclusive relationship since starting college last semester. On weekends, they usually get together at Jesse's or Casey's apartment and order in food and watch shows. Last month, they were hanging out at Jesse's apartment. They spent the day watching shows and having drinks. They both were sober. At one point, Casey pulled Jesse closer and put both arms around Jesse. Casey asked if Jesse wanted to have sex, and Jesse said no. Casey was irritated and warned Jesse that they could stop seeing each other. In the end, they ended up having sex.

Appendix G: Institutional Review Board Approval



UNIVERSITY OF
MARYLAND

INSTITUTIONAL REVIEW BOARD

1204 Marie Mount Hall
College Park, MD 20742-5125
TEL 301.405.4212
FAX 301.314.1475
irb@umd.edu
www.umresearch.umd.edu/IRB

DATE: April 22, 2021

TO: Israel Abebe
FROM: University of Maryland College Park (UMCP) IRB

PROJECT TITLE: [1716522-1] Assessing undergraduate students' judgement of consent seeking and coercive behaviors using a factorial vignette experiment

REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: April 22, 2021
EXPIRATION DATE: April 21, 2022
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7

Thank you for your submission of New Project materials for this project. The University of Maryland College Park (UMCP) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

Prior to submission to the IRB Office, this project received scientific review from the departmental IRB Liaison.

This submission has received Expedited Review based on the applicable federal regulations.

This project has been determined to be a MINIMAL RISK project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for

continuing review must be received with sufficient time for review and continued approval before the expiration date of April 21, 2022.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Unless a consent waiver or alteration has been approved, Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others (UPIRSOs) and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Please note that all research records must be retained for a minimum of seven years after the completion of the project.

If you have any questions, please contact the IRB Office at 301-405-4212 or irb@umd.edu. Please include your project title and reference number in all correspondence with this committee.

Generated on IRBNet

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Maryland College Park (UMCP) IRB's records.

Appendix H: D-optimal Design

Four vignette factors: A, B, C, D

```
# ::::: generate vignette population :::::
X <- expand.grid(A = factor(1:2, labels = c('a1', 'a2')),
                B = factor(1:2, labels = c('b1', 'b2')),
                C = factor(1:2, labels = c('c1', 'c2')),
                D = factor(1:3, labels = c('d1', 'd2', 'd3')))

X

##      A  B  C  D
## 1  a1 b1 c1 d1
## 2  a2 b1 c1 d1
## 3  a1 b2 c1 d1
## 4  a2 b2 c1 d1
## 5  a1 b1 c2 d1
## 6  a2 b1 c2 d1
## 7  a1 b2 c2 d1
## 8  a2 b2 c2 d1
## 9  a1 b1 c1 d2
## 10 a2 b1 c1 d2
## 11 a1 b2 c1 d2
## 12 a2 b2 c1 d2
## 13 a1 b1 c2 d2
## 14 a2 b1 c2 d2
## 15 a1 b2 c2 d2
## 16 a2 b2 c2 d2
## 17 a1 b1 c1 d3
## 18 a2 b1 c1 d3
## 19 a1 b2 c1 d3
## 20 a2 b2 c1 d3
## 21 a1 b1 c2 d3
## 22 a2 b1 c2 d3
## 23 a1 b2 c2 d3
## 24 a2 b2 c2 d3

# size of vignette population
(pop.n <- nrow(X))

## [1] 24

# set size and number of sets
setsize <- 6 # try different set sizes (4, 6, 8, 12)
(set.n <- pop.n / setsize) # number of sets

## [1] 4

# ::::: search for a D-optimal design :::::
# Design-generating model: all main and two-way interaction effects
# (also try a model with main effects only (~ A + B + C + D))
# (for complex designs & models, this may take some time)
desD <- optBlock(~ A + B + C + D + A:B + A:C + A:D +
                 B:C + B:D + C:D, withinData = X,
```

```

                                blocksizes = rep(setsize, set.n))
desD
## $D
## [1] 0.7123909
##
## $diagonality
## [1] 0.921
##
## $Blocks
## $Blocks$B1
##      A  B  C  D
## 1  a1 b1 c1 d1
## 8  a2 b2 c2 d1
## 11 a1 b2 c1 d2
## 14 a2 b1 c2 d2
## 20 a2 b2 c1 d3
## 21 a1 b1 c2 d3
##
## $Blocks$B2
##      A  B  C  D
## 2  a2 b1 c1 d1
## 7  a1 b2 c2 d1
## 9  a1 b1 c1 d2
## 16 a2 b2 c2 d2
## 19 a1 b2 c1 d3
## 22 a2 b1 c2 d3
##
## $Blocks$B3
##      A  B  C  D
## 3  a1 b2 c1 d1
## 6  a2 b1 c2 d1
## 12 a2 b2 c1 d2
## 13 a1 b1 c2 d2
## 18 a2 b1 c1 d3
## 23 a1 b2 c2 d3
##
## $Blocks$B4
##      A  B  C  D
## 4  a2 b2 c1 d1
## 5  a1 b1 c2 d1
## 10 a2 b1 c1 d2
## 15 a1 b2 c2 d2
## 17 a1 b1 c1 d3
## 24 a2 b2 c2 d3
##
##
## $design
##      A  B  C  D
## 1  a1 b1 c1 d1
## 8  a2 b2 c2 d1
## 11 a1 b2 c1 d2
## 14 a2 b1 c2 d2
## 20 a2 b2 c1 d3

```

```

## 21 a1 b1 c2 d3
## 2 a2 b1 c1 d1
## 7 a1 b2 c2 d1
## 9 a1 b1 c1 d2
## 16 a2 b2 c2 d2
## 19 a1 b2 c1 d3
## 22 a2 b1 c2 d3
## 3 a1 b2 c1 d1
## 6 a2 b1 c2 d1
## 12 a2 b2 c1 d2
## 13 a1 b1 c2 d2
## 18 a2 b1 c1 d3
## 23 a1 b2 c2 d3
## 4 a2 b2 c1 d1
## 5 a1 b1 c2 d1
## 10 a2 b1 c1 d2
## 15 a1 b2 c2 d2
## 17 a1 b1 c1 d3
## 24 a2 b2 c2 d3
##
## $rows
## [1] 1 8 11 14 20 21 2 7 9 16 19 22 3 6 12 13 18 23 4 5 10 15 17 24

# ::::: Check the confounding/aliasing structure :::::
dsgn <- desD$design # extract the partition
(design)
Vid <- as.factor(paste("V", desD$rows, sep = "")) # vignette ID
set <- as.factor(rep(1:set.n, each = setsize)) # generate a set indicator

dat <- data.frame(Vid, dsgn, set) # create a data frame
sapply(dat, contrasts) # check coding (should be deviation/effect coding)

## $Vid
## [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10] [,11] [,12] [,13] [,14]
## V1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
## V10 0 1 0 0 0 0 0 0 0 0 0 0 0 0
## V11 0 0 1 0 0 0 0 0 0 0 0 0 0 0
## V12 0 0 0 1 0 0 0 0 0 0 0 0 0 0
## V13 0 0 0 0 1 0 0 0 0 0 0 0 0 0
## V14 0 0 0 0 0 1 0 0 0 0 0 0 0 0
## V15 0 0 0 0 0 0 1 0 0 0 0 0 0 0
## V16 0 0 0 0 0 0 0 1 0 0 0 0 0 0
## V17 0 0 0 0 0 0 0 0 1 0 0 0 0 0
## V18 0 0 0 0 0 0 0 0 0 1 0 0 0 0
## V19 0 0 0 0 0 0 0 0 0 0 1 0 0 0
## V2 0 0 0 0 0 0 0 0 0 0 0 1 0 0
## V20 0 0 0 0 0 0 0 0 0 0 0 0 1 0
## V21 0 0 0 0 0 0 0 0 0 0 0 0 0 1
## V22 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## V23 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## V24 0 0 0 0 0 0 0 0 0 0 0 0 0 0

```

```

## V3      0      0      0      0      0      0      0      0      0      0      0      0      0      0
## V4      0      0      0      0      0      0      0      0      0      0      0      0      0      0
## V5      0      0      0      0      0      0      0      0      0      0      0      0      0      0
## V6      0      0      0      0      0      0      0      0      0      0      0      0      0      0
## V7      0      0      0      0      0      0      0      0      0      0      0      0      0      0
## V8      0      0      0      0      0      0      0      0      0      0      0      0      0      0
## V9     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1     -1
##      [,15] [,16] [,17] [,18] [,19] [,20] [,21] [,22] [,23]
## V1         0         0         0         0         0         0         0         0         0
## V10        0         0         0         0         0         0         0         0         0
## V11        0         0         0         0         0         0         0         0         0
## V12        0         0         0         0         0         0         0         0         0
## V13        0         0         0         0         0         0         0         0         0
## V14        0         0         0         0         0         0         0         0         0
## V15        0         0         0         0         0         0         0         0         0
## V16        0         0         0         0         0         0         0         0         0
## V17        0         0         0         0         0         0         0         0         0
## V18        0         0         0         0         0         0         0         0         0
## V19        0         0         0         0         0         0         0         0         0
## V2        0         0         0         0         0         0         0         0         0
## V20        0         0         0         0         0         0         0         0         0
## V21        0         0         0         0         0         0         0         0         0
## V22        1         0         0         0         0         0         0         0         0
## V23        0         1         0         0         0         0         0         0         0
## V24        0         0         1         0         0         0         0         0         0
## V3         0         0         0         1         0         0         0         0         0
## V4         0         0         0         0         1         0         0         0         0
## V5         0         0         0         0         0         1         0         0         0
## V6         0         0         0         0         0         0         1         0         0
## V7         0         0         0         0         0         0         0         1         0
## V8         0         0         0         0         0         0         0         0         1
## V9        -1        -1        -1        -1        -1        -1        -1        -1        -1
##
## $A
##      [,1]
## a1       1
## a2      -1
##
## $B
##      [,1]
## b1       1
## b2      -1
##
## $C
##      [,1]
## c1       1
## c2      -1
##
## $D
##      [,1] [,2]
## d1       1    0
## d2       0    1
## d3      -1   -1
##

```

```

## $set
##   [,1] [,2] [,3]
## 1    1    0    0
## 2    0    1    0
## 3    0    0    1
## 4   -1   -1   -1

# generate a random outcome variable
# (for the purpose of checking the confounding in a saturated lm() analysis)
dat$y <- rnorm(length(Vid))

# confounding/aliasing structure
# (without any respondent ID indicators, they are modeled later, with real
# data, as random effects)
out.lm <- lm(y ~ set + A*B*C*D, dat, x = TRUE)
# summary(out.lm)
alias(out.lm)

## Model :
## y ~ set + A * B * C * D
##
## Complete :
##      (Intercept) set1 set2 set3 A1  B1  C1  D1  D2  A1:B1 A1:C1 B1:C1
## A1:B1:D2      0      -3/4 3/4 3/4  0   0   0   0   0   1/4    0    0
## B1:C1:D1      0        1  1 -1   0   0   0   0   0   0   -1/3   0
## B1:C1:D2      0       -1  2 -2   0   0   0   0   0   0   -1/6  -1/2
##      A1:D1 A1:D2 B1:D1 B1:D2 C1:D1 C1:D2 A1:B1:C1 A1:B1:D1 A1:C1:D1
## A1:B1:D2      0      0      0      0      0      0      0      1/2      0
## B1:C1:D1      0      0      0      0      0      0      0      0      1/3
## B1:C1:D2      0      0      0      0      0      0      0      0      5/3
##      A1:C1:D2 A1:B1:C1:D1 A1:B1:C1:D2
## A1:B1:D2      0      0      0
## B1:C1:D1 -2/3      0      0
## B1:C1:D2 -1/3      0      0

# ::::: check orthogonality :::::
# (predictors within a factor and predictors of confounded effects
# are always correlated)
cor(out.lm$x[, -1]) # (the intercepted is dropped here)

##      set1      set2      set3 A1 B1 C1 D1 D2      A1:B1
## set1      1.0000000 0.5000000 0.5000000 0 0 0 0.0 0.0 0.0000000
## set2      0.5000000 1.0000000 0.5000000 0 0 0 0.0 0.0 -0.2357023
## set3      0.5000000 0.5000000 1.0000000 0 0 0 0.0 0.0 -0.2357023
## A1         0.0000000 0.0000000 0.0000000 1 0 0 0.0 0.0 0.0000000
## B1         0.0000000 0.0000000 0.0000000 0 1 0 0.0 0.0 0.0000000
## C1         0.0000000 0.0000000 0.0000000 0 0 1 0.0 0.0 0.0000000
## D1         0.0000000 0.0000000 0.0000000 0 0 0 1.0 0.5 0.0000000
## D2         0.0000000 0.0000000 0.0000000 0 0 0 0.5 1.0 0.0000000
## A1:B1      0.0000000 -0.2357023 -0.2357023 0 0 0 0.0 0.0 1.0000000
## A1:C1      0.2357023 0.2357023 0.0000000 0 0 0 0.0 0.0 0.0000000
## B1:C1     -0.2357023 0.0000000 -0.2357023 0 0 0 0.0 0.0 0.0000000
## A1:D1      0.0000000 0.0000000 0.0000000 0 0 0 0.0 0.0 0.0000000

```

## A1:D2	0.0000000	0.0000000	0.0000000	0	0	0	0.0	0.0	0.0000000
## B1:D1	0.0000000	0.0000000	0.0000000	0	0	0	0.0	0.0	0.0000000
## B1:D2	0.0000000	0.0000000	0.0000000	0	0	0	0.0	0.0	0.0000000
## C1:D1	0.0000000	0.0000000	0.0000000	0	0	0	0.0	0.0	0.0000000
## C1:D2	0.0000000	0.0000000	0.0000000	0	0	0	0.0	0.0	0.0000000
## A1:B1:C1	0.0000000	0.0000000	0.0000000	0	0	0	0.0	0.0	0.0000000
## A1:B1:D1	0.0000000	0.0000000	0.0000000	0	0	0	0.0	0.0	0.0000000
## A1:B1:D2	0.0000000	0.5773503	0.5773503	0	0	0	0.0	0.0	0.0000000
## A1:C1:D1	0.5773503	0.0000000	0.5773503	0	0	0	0.0	0.0	0.0000000
## A1:C1:D2	0.5773503	0.2886751	0.2886751	0	0	0	0.0	0.0	0.0000000
## B1:C1:D1	0.5773503	0.5773503	0.0000000	0	0	0	0.0	0.0	0.0000000
## B1:C1:D2	0.0000000	0.2886751	-0.2886751	0	0	0	0.0	0.0	0.0000000
## A1:B1:C1:D1	0.0000000	0.0000000	0.0000000	0	0	0	0.0	0.0	0.0000000
## A1:B1:C1:D2	0.0000000	0.0000000	0.0000000	0	0	0	0.0	0.0	0.0000000
##	A1:C1	B1:C1	A1:D1	A1:D2	B1:D1	B1:D2	C1:D1	C1:D2	A1:B1:C1
## set1	0.2357023	-0.2357023	0.0	0.0	0.0	0.0	0.0	0.0	0
## set2	0.2357023	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## set3	0.0000000	-0.2357023	0.0	0.0	0.0	0.0	0.0	0.0	0
## A1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## B1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## C1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## D1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## D2	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## A1:B1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## A1:C1	1.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## B1:C1	0.0000000	1.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## A1:D1	0.0000000	0.0000000	1.0	0.5	0.0	0.0	0.0	0.0	0
## A1:D2	0.0000000	0.0000000	0.5	1.0	0.0	0.0	0.0	0.0	0
## B1:D1	0.0000000	0.0000000	0.0	0.0	1.0	0.5	0.0	0.0	0
## B1:D2	0.0000000	0.0000000	0.0	0.0	0.5	1.0	0.0	0.0	0
## C1:D1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	1.0	0.5	0
## C1:D2	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.5	1.0	0
## A1:B1:C1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	1
## A1:B1:D1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## A1:B1:D2	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## A1:C1:D1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## A1:C1:D2	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## B1:C1:D1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## B1:C1:D2	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## A1:B1:C1:D1	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
## A1:B1:C1:D2	0.0000000	0.0000000	0.0	0.0	0.0	0.0	0.0	0.0	0
##	A1:B1:D1	A1:B1:D2	A1:C1:D1	A1:C1:D2	B1:C1:D1	B1:C1:D2			
## set1	0.0	0.0000000	0.5773503	0.5773503	0.5773503	0.0000000			
## set2	0.0	0.5773503	0.0000000	0.2886751	0.5773503	0.2886751			
## set3	0.0	0.5773503	0.5773503	0.2886751	0.0000000	-0.2886751			
## A1	0.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
## B1	0.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
## C1	0.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
## D1	0.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
## D2	0.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
## A1:B1	0.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
## A1:C1	0.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
## B1:C1	0.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
## A1:D1	0.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			

```

## A1:D2      0.0 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## B1:D1      0.0 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## B1:D2      0.0 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## C1:D1      0.0 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## C1:D2      0.0 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## A1:B1:C1   0.0 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## A1:B1:D1   1.0 0.5000000 0.0000000 0.0000000 0.0000000 0.0000000
## A1:B1:D2   0.5 1.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## A1:C1:D1   0.0 0.0000000 1.0000000 0.5000000 0.0000000 0.0000000
## A1:C1:D2   0.0 0.0000000 0.5000000 1.0000000 0.0000000 0.0000000
## B1:C1:D1   0.0 0.0000000 0.0000000 0.0000000 1.0000000 0.5000000
## B1:C1:D2   0.0 0.0000000 0.0000000 0.0000000 0.5000000 1.0000000
## A1:B1:C1:D1 0.0 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
## A1:B1:C1:D2 0.0 0.0000000 0.0000000 0.0000000 0.0000000 0.0000000
##           A1:B1:C1:D1 A1:B1:C1:D2
## set1      0.0      0.0
## set2      0.0      0.0
## set3      0.0      0.0
## A1        0.0      0.0
## B1        0.0      0.0
## C1        0.0      0.0
## D1        0.0      0.0
## D2        0.0      0.0
## A1:B1     0.0      0.0
## A1:C1     0.0      0.0
## B1:C1     0.0      0.0
## A1:D1     0.0      0.0
## A1:D2     0.0      0.0
## B1:D1     0.0      0.0
## B1:D2     0.0      0.0
## C1:D1     0.0      0.0
## C1:D2     0.0      0.0
## A1:B1:C1  0.0      0.0
## A1:B1:D1  0.0      0.0
## A1:B1:D2  0.0      0.0
## A1:C1:D1  0.0      0.0
## A1:C1:D2  0.0      0.0
## B1:C1:D1  0.0      0.0
## B1:C1:D2  0.0      0.0
## A1:B1:C1:D1 1.0      0.5
## A1:B1:C1:D2 0.5      1.0

# ::::: check balance :::::
# (for this simple example balance will always be achieved,
# as long as the vignette population is an integer multiple of the set size)
table(dat$Vid)

##
## V1 V10 V11 V12 V13 V14 V15 V16 V17 V18 V19 V2 V20 V21 V22 V23 V24 V3 V4 V
5
## 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1

```

```
## V6 V7 V8 V9
## 1 1 1 1

with(dat, table(Vid, set))

##      set
## Vid  1 2 3 4
## V1   1 0 0 0
## V10  0 0 0 1
## V11  1 0 0 0
## V12  0 0 1 0
## V13  0 0 1 0
## V14  1 0 0 0
## V15  0 0 0 1
## V16  0 1 0 0
## V17  0 0 0 1
## V18  0 0 1 0
## V19  0 1 0 0
## V2   0 1 0 0
## V20  1 0 0 0
## V21  1 0 0 0
## V22  0 1 0 0
## V23  0 0 1 0
## V24  0 0 0 1
## V3   0 0 1 0
## V4   0 0 0 1
## V5   0 0 0 1
## V6   0 0 1 0
## V7   0 1 0 0
## V8   1 0 0 0
## V9   0 1 0 0

# NOTE: run the algorithm multiple times and use the solution with the least
#confounding (store each solution before re-running the algorithm)
desD.choice1 <- desD
```

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