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A Prospective Investigation of Behavioral Risk Factors and Sexual Victimization Outcome in College Females

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A PROSPECTIVE INVESTIGATION OF BEHAVIORAL RISK FACTORS AND SEXUAL
VICTIMIZATION OUTCOME IN COLLEGE FEMALES

by

Tara E. Casady

A dissertation submitted to the Graduate College
in partial fulfillment of the requirements
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A PROSPECTIVE INVESTIGATION OF BEHAVIORAL RISK FACTORS AND SEXUAL VICTIMIZATION OUTCOME IN COLLEGE FEMALES

Tara E. Casady, Ph.D.

Western Michigan University, 2016

The current study was a prospective examination of the potential predictors of sexual victimization in women with and without sexual victimization histories. Utilizing a longitudinal design, we investigated sexually risky behavior, sexual sensation seeking, and substance use disordered behavior with regard to the later experience of sexual victimization during 2-, 6-, and 12-month follow-up periods. As reported previously, Time 1 data suggested that women with victimization histories were more likely to engage in sexually risky behaviors, engage in substance use disordered behavior, and were more likely to endorse higher scores of sexual sensation seeking. A statistically significant relationship was not found between these measures and later sexual victimization nor were they found to differentiate among sexually victimized and nonvictimized women at follow-up periods of 2, 6, and 12 months. Although risky sexual behavior, seeking higher rates of sexual excitement, and substance use were highly correlated with sexual victimization at Time 1, these analyses did not reveal that these variables placed women at greater vulnerability for sexual victimization at 2-, 6-, or 12-month follow-up. High attrition rates and lower rates of sample substance use and risky sexual behavior for each follow-up period may have impacted the study results. It is also possible that in any given sexual violence situation, several variables specific to the victim, perpetrator, and situation

interact such that discovering unifying predictor variables is difficult. Current literature and results of our prior research suggest further investigation of interventions that target these variables to increase protective strategies in college females.

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DEDICATION

To my father, Michael J. Casady, for his unwavering support, encouragement, love, and devotion to my life and educational pursuits. My father modeled and shaped within me patience, acceptance, pragmatism, faith, and love for change and knowledge. Thank you for continually “painting the fence.”

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INTRODUCTION

Research indicates that sexual victimization of women is a wide spread problem in the United States. The term ‘sexual victimization’ encompasses a range of forced sexual contact including rape, coercive tactics, inappropriate touching, forced contact, and use of power or influence. Research has documented between 17% and 38% of women in community and college samples report at least one type of sexual victimization experience (Casey & Nurius, 2005; Davis, Combs-Lane, & Jackson, 2002; Kimerling, Alvarez, Pavao, Kaminski, & Baumrind, 2007; Tjaden & Thoennes, 2000). However, rates as high as 69% for any type of unwanted sexual contact have been found for college samples of women (Fisher, Cullen, & Turner, 2000). In fact, 18% of women report experiencing completed rape, including those facilitated by alcohol or drugs (Kilpatrick, Resnick, Ruggiero, Conoscenti, & McCauley, 2007). Researchers estimate that this translates to approximately 20.2 million women in the U.S. (Kilpatrick et al., 2007).

College aged women are at particular risk given that most female victims, up to 79.6%, report experiencing their first rape before the age of 25 years old. In fact, approximately 1 in 5 college women report experiencing some type of sexually victimization (Krebs, Lindquist, Warner, Fisher, & Martin, 2009). The freshmen year appears to be a particularly vulnerable period as compared to the remainder of college years and has often been referred to as the “red zone” (Cranney, 2015; Parks, Hsieh, Taggart, & Bradizza, 2014). In a large survey of 22 colleges and universities, Cranney (2015) found that freshmen year is a particularly vulnerable year for the experience of sexual assault of many different types including drug and alcohol facilitated assault, attempted and completed assault, as well as verbal coercion for sexual activity. The risk for assault appeared to be the greatest at parties, however, risk also continued to be especially high for freshmen as compared to other grades while “hanging out.” The “red zone” risk did not

appear to extend into the sophomore year, with the exception of attempted forced rape at parties. It has been hypothesized that fraternity and sorority (Greek) inductions and parties during this time period may be a substantial risk factor (Flack et al., 2008; Gross, Winslett, Roberts, & Gohn, 2006). However, the pattern remained stable even when considering schools with and without Greek organizations. This suggests other factors specific to college students that span different types of social environments may be more salient risk factors.

Despite high prevalence rates and a multitude of publications on the subject, researchers have not yet identified reliable behavioral constructs that describe a common behavioral pattern and that unite the numerous risk factors and predictors of unwanted sexual experiences. In fact, the single greatest predictor of sexual victimization is a previous victimization experience (Gidycz, Ochowski, King, & Rich, 2008). Among adult samples of sexually victimized women, up to two thirds report a history of previous sexual victimization (Arata, 2002; Casey & Nurius, 2005; Stermac, Reist, Addison, & Millar, 2002; Ulman, 2016; Urquiza & Goodlin-Jones, 1994). Victimization that occurred in either childhood or adolescence substantially increases the risk of adult victimization (Classen et al., 2005; Siegel & Williams, 2003). In one study, 75% of women reporting adulthood victimization also experienced sexual victimization in childhood or adolescence (Kimerling et al., 2007). In their review of the empirical literature, Classen et al. (2005) document that two out of three previous victims of sexual victimization will be revictimized. Several other risk factors have been identified in the literature including poverty (Byrne et al., 1999), past general interpersonal victimization (Classen, et al., 2005; Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997), substance abuse and dependence (Combs-Lane & Smith, 2002; Greene & Navarro, 1998), impaired risk recognition (Combs-Lane et al., 2002; Wilson, Calhoun, Bernatm, 1999), low sexual refusal assertiveness (Testa, VanZile-Tamsen &

Livingston, 2007), and perceived benefit for engaging in risk taking behavior (Greene and Navarro, 1998; Smith, Davis, & Fricker-Elhai, 2004). Adolescent risk taking behavior such as earlier age of first alcohol use, illicit drug use, earlier consensual sex, and running away before the age of 18 years old has been shown to mediate the relationship between childhood/adolescent sexual victimization and adult sexual victimization (Fargo, 2009).

Experiencing repeated episodes of victimization is also associated with significantly higher psycho-behavioral consequences including higher sexual risk taking, lower self-esteem, and higher psychological distress (French, Latimer, Klemp, & Butler, 2014). Participants with multiple victimization experiences were more likely to report completed rape and were at a higher probability of experiencing all unwanted sexual contact tactics including, verbal coercion, substance facilitated, and physical force. French et al. (2014) emphasize that although completed rape is viewed as the most severe form of sexual victimization, it is not the only tactic likely to create problematic outcomes for victims. In fact, the accumulation of experiences and exposure to multiple tactics appears to strongly contribute to negative outcomes such as higher psychological distress and risk for further exposure to victimization (Cavanaugh, et al., 2012; Classen et al., 2005; French et al., 2014).

A majority of victimized women report familiarity with their perpetrator, identifying the perpetrator as either an acquaintance or a person with whom a romantic relationship occurred (Harrington & Leitenberg, 1994; Littleton, Radecki Breitkopf, & Berenson, 2007). In addition, many perpetrators of drug and alcohol facilitated rape tend to not only be familiar to the victim but also of a close interpersonal relationship such as an ex-husband, relative, or dating partner (Kilpatrick et al., 2007). This familiarity with the perpetrator is likely related to the finding that many women do not label unwanted sexual contact as a victimization experience (Kahn,

Jackson, Kully, Badger, & Halvorsen, 2003). Instead, a majority of victims that report familiarity with the perpetrator or report substance involvement at the time of the sexual encounter, refer to victimization experiences as a ‘serious miscommunication’ (Orchowski, Untied, & Gidycz, 2013). Labeling victimization experiences in this manner is problematic in that this may impact engagement in future preventive behavior.

While the empirical link is strong between past victimization and subsequent victimization, it is more likely an indirect relationship with other variables that increases risk. It is imperative to develop and examine interventions designed to reduce risk as well as to conduct longitudinal research to measure the temporal sequence of victimization experiences, environmental risk factors, and alcohol and other drug use in order to inform effective interventions (Kilpatrick et al., 2007). One potential research avenue by which to accomplish this goal involves the investigation of the varying risk factors organized by specific response classes. Identifying unifying constructs may aid in identifying useful behavioral targets that may be addressed in both treatment and prevention programs to reduce risk of sexual assault. Many of the risk factors identified in the literature may be unified under the constructs of sexual risk taking propensity and substance use disordered behavior.

Sexual Risk Taking Propensity

Research comparing victims to nonvictims has consistently demonstrated a relationship between sexual activity and sexual victimization, with many victims engaging in more sexual activity, identifying more sexual partners (Campbell et al., 2004; Corbin, Bernat, Calhoun, McNair, & Seals, 2001; Green & Navarro, 1998; Seigel & Williams, 2003), overvaluing sexual pleasure (Green & Navarro, 1998), and engaging in dysfunctional sexual behavior such as indiscriminate sexual contact or the use of sex as a coping strategy (Messman-Moore et al.,

2008). Sexual risk taking behavior is defined as any behavior that increases the probability of negative consequences associated with sexual contact including unwanted sexual experiences, contracting HIV and other sexually transmitted infections (STI's), and unplanned pregnancy. Included in this definition are indiscriminate behaviors such as having multiple partners, having risky, casual sex or sexual activity with unknown partners, failure to discuss risk topics prior to intercourse, and a failure to take protective actions such as condom use or birth control (Cooper, 2002). The engagement in risky sexual activity and liberal attitudes regarding sex has also been shown to be an important potential risk factor for adult sexual victimization (Fargo, 2009; Koss and Dinero, 1989; Testa, Hoffman, & Livingston, 2010). Seigel and Williams (2003) found adult sexual assault victims had approximately three times as many sexual partners as non-victimized women. Corbin et al. (2001) found an increase in sexual partners was even more pronounced for those in which rape or attempted rape occurred. Notably, the occurrence of first consensual sexual activity did not differ in this sample.

Not only are women with victimization histories more likely to demonstrate greater risky sexual behavior, they are also more likely to show a decreased effectiveness in responding to threat during sexual situations. In studies utilizing analogue measures of risky dating situations, women disclosing more liberal sexual attitudes were rated as less effective by experts when responding to both high and low risk vignettes depicting varying sexually aggressive situations (Nason & Yeater, 2012). In addition, Nason and Yeater (2012) found that a greater willingness to engage in sexual activity mediated the relationship between victimization history and effectiveness in responding to the vignettes. Effectiveness in responding to the vignettes was also particularly decreased in situations involving alcohol use as well as situations involving consensual activity prior to increasing escalation of sexually aggressive behavior (Nason &

Yeater, 2011). In a prospective study by Messman-Moore et al., (2008), dysfunctional sexual behavior, such as increased distress regarding sexual activity, shame regarding sexual activities or responses, or preoccupation with unwanted sexual experiences, was found to increase the risk for rape and sexual coercion. Similarly, research findings demonstrate women with adult sexual assaults histories are less sexually assertive in consensual settings than non-victimized women, resulting in less condom insistence and an increased likelihood of unprotected sex (Stoner et al., 2008).

Although researchers have documented a strong positive correlation between sexual risk behavior and subsequent victimization, and some have shown a predictive relationship, researchers are still investigating why some women continue to engage in a high rate of sexually risky behavior despite education about risks, experience of being victimized, and the strong aversive consequences that results from this behavior. Even in the presence of an effective repertoire for responding to sexual aggression, greater engagement in sexual activity and sexual activity with multiple partners may place women at an increased risk of exposure to potential perpetrators or sexually aggressive individuals (Messman-Moore et al., 2009). Similarly, due to the greater likelihood of use of substances prior to sexual situations, women may be at a greater disadvantage in terms of defense against a potential perpetrator, display greater willingness to engage in risky behavior, or experience diminished cognitive abilities to recognize dangerous stimuli (Messman-Moore et al., 2008).

One hypothesized construct thought to underlie both ineffective or lack of sexually protective behavior and other sexual risk taking behavior is a higher propensity for sensation seeking. Sensation seeking has been highly correlated with participation in high risk behaviors (Wagner, 2001; Zuckerman, 1979) such as substance abuse, alcohol use, and less reliably to

risky sexual behavior (Hittner & Swickert, 2006; VanZile-Tamsen, Testa, Harlow, & Livingston, 2006; Wagner, 2001). Wilson, Waldron, and Scarpa (2014) suggest that examining global indicators such as sensation seeking propensity might be more informative than only examining specific risky behaviors such as substance use and sexual promiscuity, given that these factors have been repeatedly demonstrated to be correlates of sexual victimization.

Previous research examining high (HSS) and low (LSS) sensation seekers suggests a hypersensitivity to intense stimuli but a reduced reactivity to stressors (Depue & Collins, 1999; Lang, Shin, & Lee, 2005; Lissek & Powers, 2003). In addition, HSS's tend to demonstrate lower resting heart rate and heart rate deceleration in response to a range of auditory stimuli (Lissek & Powers, 2003). This is suggestive of a stronger appetitive-approach repertoire and a weaker avoidance-withdrawal repertoire (Depue & Collins, 1999; Lang, et al., 2005; Lissek & Powers, 2003). This physiological blunting may increase risk for future victimization (Patriquin, Wilson, Kelleher, & Scarpa, 2012). Researchers have examined reduced physiological reactivity to sexual threat cues as a hypothesized explanatory mechanism underlying deficiencies in risk recognition and response. For example, in one emotional Stroop task, women with multiple sexual victimization experiences demonstrated lower sympathetic and parasympathetic reactivity during sexual threat words as compared to women with only child sexual assault histories who demonstrated an increase in physiological activity (Patriquin, Wilson, Kelleher, & Scarpa, 2012). In a prospective study investigating predictors of sexual victimization status across a 6-month span, lower sympathetic and parasympathetic response to an emotional Stroop task were significantly related to revictimized classification at the follow-up (Waldron, Wilson, Patriquin, & Scarpa, 2015). These researchers hypothesize that the lack of physiological response may

create a barrier to risk recognition and this, in turn, impedes one's ability to respond effectively to the situation.

Wilson et al. (2014) suggest that evaluating risky behaviors in isolation could oversimplify an understanding of revictimization. As such, Wilson et al. (2014) proposed examining sensation seeking, more specifically the component disinhibition, as a potential risk mechanism for victimization. Disinhibition is defined as the hedonistic pursuit of pleasure through extroverted activities including social drinking, parties, sex, and gambling (Zuckerman, Buchsbaum, & Murphy, 1980). In fact, the results of their study showed that greater disinhibition partially explained an increased risk for sexual assault at the three-month follow-up. Participants with higher disinhibition scores were more likely to report a history of victimization at session one as well as report having experienced a new victimization event at the three-month follow-up. Disinhibition was proposed as a partial mediator of victimization that could reflect an overall shift in physiological arousal following sexual victimization and may result in changes in threat detection and risky behaviors.

Sexual sensation seeking has also been proposed as a separate but related construct, defined as the propensity to seek optimal sexually arousing and sensory stimulating experiences (Norris et al., 2009). Sexual sensation seeking has been found to positively correlate with less insistence on condom usage, increase in sexual activity and partners, and negatively correlate with sexual risk-reduction behaviors (Norris et al., 2009). It has also been indirectly implicated in HIV risk and alcohol-involved sexual activity (Hendershot, Stoner, George, & Norris, 2007). In their cross-sectional investigation of sexual sensation seeking and risk of victimization, Monks, Tomaka, Palacios, and Thompson, (2010) found that sexual sensation seeking more strongly contributed to the prediction of sexual victimization than problematic alcohol

consumption and positive alcohol expectancies. These researchers suggest that sexual sensation seeking may be a stable dispositional variable that relates to other traditional risk factors for sexual victimization including propensity of victims to have sex at an early age, have a higher frequency of sexual encounters, and have multiple sexual partners.

Substance Use and Sexual Risk Behavior

A strong and consistent relationship has been demonstrated between sexually risky behavior, substance abuse, and sexual victimization. Alcohol use is one of the strongest known contextual determinants of risky sexual behavior (Cooper, 2010). Alcohol use prior to a dating situation has been shown to increase the chances of sexual intercourse. In addition, alcohol consumption prior to sexual intercourse increases the chances of indiscriminate partner choices and decreases the chances of discussions of STI's and STI preventative behavior. (Cooper, 2002). This is especially salient in the college environment given that the prevalence of heavy episodic drinking and risky sexual behavior, with approximately 40% reporting heavy episodic drinking and 25% reporting having six or more lifetime partners (Cooper 2002).

Alcohol use may increase the engagement in behavior that is risky but immediately reinforcing. For example, alcohol use may impair a victim's ability to recognize danger signals and engage in escape behavior, increase contact with substance abusing and possibly risky individuals, or alter the function of certain behavior in the context of the substance using environment. Alcohol use to the point of subjective drunkenness prior to the assault has been shown to be associated with higher levels of consensual contact prior to the incident than that which occurs in situations where the victim denies intoxication (Harrington & Leitehberg, 1994). Littleton and colleagues found that 45% of sexual assault victims in their sample reported engaging in binge drinking (4 or more drinks) prior to the assault (Littleton, Tabernik, Canales,

& Backstrom, 2009). College women in this sample overestimated the extent to which strong physical force and resistance are present in the typical rape and did not view the consumption of alcohol as a primary facilitator of rape.

Numerous studies have documented a strong association between substance abuse and sexual victimization, with researchers demonstrating rates as high as 88% of adult sexual assaults involving the use of substances (Messman-Moore et al. 2008). Other studies find that more than half of victims report the use of alcohol prior to the assault (Brener et al., 1995; Frinter & Robinson, 1993; Harrington & Leitenberg, 1994; Koss et al., 1987) and estimates of one half to two thirds of perpetrators having consumed alcohol prior to the sexual assault (Ullman & Brecklin, 2003). In fact, more than 97,000 college students report alcohol-related sexual assault or date rape (Kilpatrick et al, 2007). Incapacitated rape appears to be more common than alcohol or drug facilitated rape, suggesting that the most common scenario is victimization following voluntary intoxication (Eshelman et al., 2015; Kilpatrick, et al., 2007). In one prospective study, Messman- Moore et al. (2008) found 69% of sexual assaults over the 8 month study period were due to an inability to consent or resist due to the use of substances even in the absence of force. In this study almost 62% of rape victims were classified as heavy drinkers prior to the most recent sexual assault as compared to 34% of non-victimized women. This has alarming implications in that victims of drug-facilitated or incapacitated rape are nearly twice as likely as victims of forcible rape to have past-year substance use problems including demonstration of tolerance, blackouts, and repeated episodes of binge drinking (Eshelman, Messman-Moore, & Sheffer, 2015; Kilpatrick,et al., 2007). While substance related victimization appears to be the most common form, women are also least likely to report rape to law enforcement when

intoxicated or when experiencing difficulty clearly recollecting the sexual assault (Kilpatrick, et al., 2007).

Alcohol's physiological effects and beliefs about alcohol both appear to contribute to the alcohol-sexual victimization link (Monks et al, 2010). In previous research, victims have reported a greater expectation of positive effects following alcohol consumption (Corbin et al., 2001; Messman-Moore et al., 2008). Similarly, researchers have found that expectations of alcohol to reduce tension predict sexual victimization experiences (Corbin et al., 2001; Monks et al, 2010). Women with victimization histories are more likely to engage in sexual activity more often under the influence of alcohol (Corbin et al., 2001; Testa, Livingston, & Collins, 2000), indicate a greater perceived benefit and fewer negative consequences of entering a risky situation after consumption of alcohol (Testa et al., 2004), and report greater expectations of perceived benefits following risky behavior, heavy drinking, and illicit drug abuse than women without victimization histories (Smith, et al., 2004). This appears to be restricted to risky sexual and substance use behavior as participants did not report similar expectations with regard to involvement in aggressive or illegal behavior (Smith et al., 2004). They also reported a higher likelihood of engaging in sexually risky behaviors than women who had not consumed alcohol (Testa, et al., 2000). Fargo (2009) found that risky sexual behavior mediated the relationship between problematic alcohol use and adult sexual victimization.

Interestingly, one investigation found that alcohol use does not increase sexual risk taking through increases in physiological arousal but rather increases sexually risky behavior only in the presence of reports of subjective arousal (George et al., 2009). In one study, women with adult sexual victimization experiences exhibited less physiological sexual arousal and more negative affect during heat-of-the-moment sexual scenarios while under the influence of alcohol. The

researchers hypothesized that sexual contexts might evoke conditioned negative reactions as a result of previous victimization experience. They state that the relationship between adult sexual victimization, increases in sexually risky behavior, lower positive mood and sexual desire in sexual encounters appears paradoxical (George, et al., 2014). In another study of sexual response and alcohol use among a sexually risky sample of women, women with victimization histories responded differently than women without victimization histories. Alcohol increased reported positive mood but results also revealed a suppressant effect on risk via a reduction in sexual desire. Compared to women without sexual victimization histories, women with adult sexual victimization experiences exhibited significantly less positive mood, sexual desire, and marginally less subjective sexual arousal during a 'heat of the moment' sexual scenario (George et al., 2014). If women exhibit less sexual arousal and desire in these situations, they may require an increased level of sexual stimulation to experience arousal, as is consistent with sexual sensation seeking findings, or may increase alcohol consumption to reduce negative affect as well as to experience subjective sexual arousal.

Alcohol use is not only a risk factor for sexual victimization, but also a behavior in which women who report a past history of sexual victimization are more likely to engage. A greater frequency and amount of consumption of alcohol in general has been found among women with adult histories of attempted or completed rape above those who experienced either some other type of unwanted sexual experience or no history of sexual victimization (Corbin et al., 2001). Women who report sexual victimization are much more likely to experience problem drinking (Najdowski & Ulman, 2009), dependency on alcohol (Seigel & Williams, 2003), and consume alcohol before engaging in sex (Seigel & Williams, 2003). This places women with victimization histories at particular risk of re-victimization.

Given the current literature, alcohol use appears to be an important factor involved in both the facilitation of victimization in both non-victims and women with victimization histories and problematic use appears to increase as a result of victimization experiences. Specifically, women with substance related victimization (SRV) histories as opposed to forcible victimization report more frequent heavy episodic drinking, marijuana use, a higher tolerance, and blackouts (Eshelman et al., 2015). Delayed risk perception has also shown a unique relationship with SRV. In a study utilizing risky dating scenarios and decision making, Eshelman et al. (2015), found that victims of SRV reported feeling uncomfortable significantly later and delayed leaving the scenario significantly longer than victims of forcible sexual victimization. Approximately half of the SRV women indicated they would leave a party and go to the man's apartment in the scenario, resulting in isolating themselves with the perpetrator and making escape more difficult.

The effects of alcohol on one's behavior is likely to be multiply determined with consideration to physiological effect, one's beliefs about alcohol's effects on sexual behavior, and situation specific contingencies controlling the behavior (Cooper, 2002). Additionally, stable aspects of one's behavior are likely to impact risky sexual behavior such as sexual sensation seeking and problematic substance use. (Cooper, 2002). In fact, Nason and Yeater (2012) in their study examining women's responses to high and low risk vignettes of dating and social situations, found that the only significant predictor of a women's response was more liberal sexual attitudes and that victimization history alone did not predict their responses to vignettes. They also found that the effectiveness of women's responses decreased more in situations involving alcohol and increased less in situations involving sexual activity. The role of sexually risky behavior propensity or sexual sensation seeking and substance use may impact other

models and explain some of the difficulty women with victimization histories experience when responding to sexually aggressive scenarios.

The Current Study

The current study sought to improve upon the literature through use of a prospective design, in order to potentially establish temporal relationships between sexually risky behavior, sexual victimization, and substance use. Interventions aimed at altering sexual risk taking propensity or sexual sensation seeking and substance use may address potential methods of increasing protective behavior to reduce risk while also allowing women to achieve their interpersonal goals (Nason & Yeater, 2012). Some studies have not found a consistent association between victimization history and risky sexual behavior, however it is notable that this may be as a result of defining risky sexual behavior by a lack of insistence on condom usage and a failure to consider a broader range of risky sexual behavior other than condom insistence (Cooper, 2002; Schacht et al., 2010). As such, the current study also utilized a behaviorally specific measure of a broad range of potentially risky sexual behavior. Lastly, we sought to investigate the potential of a behavior analogue risk task to predict sexual risk taking behavior, in order to address one of the limitations of existing research in the area of risk taking and sexual victimization that relies heavily on self-report measures of impulsivity. To accomplish this, we used a behavior analogue measure to also assess risk taking. The current study uses a behavior analogue task, Balloon Analogue Risk Task (BART), that has correlated well with a number of risk related behaviors and attempts to adequately simulate real life such that risky choice may result in short term reinforcement but continued engagement will increasingly likely result in an aversive consequence. Study 1 did not reveal significant associations between the BART and measures of impulsivity, problematic substance use, sexual sensation seeking, and sexual risk

behavior. However, we sought to investigate the potential usefulness of this task to identify those that may be at risk for engaging in problematic sexual risk behavior and substance use at 2, 6, and 12-month follow-up periods.

Program of Research

Previously, Study 1 investigated the relationship between propensity to engage in risk taking behavior using a behavior analogue measure of risk taking propensity, and sexual victimization experiences. In addition, Study 1 investigated the relationship between sexual victimization and risk taking behavior by measuring risky behavioral practices including sexual health risk behavior, substance use and abuse, sexual sensation seeking, cognitive appraisal of risk taking involvement, and self-report measures of impulsivity and sensation seeking. Two hundred and thirty participants completed the behavior analogue risk taking task and Study 1 self-report measures. The Study 1 results demonstrated that women with victimization histories were more likely to endorse problematic substance use and report a greater number of sexual partners. Women with victimization histories were more likely to be classified as substance dependent than women without such histories. Revictimized women were substantially more likely to obtain higher scores on a scale measuring substance abuse and sexual sensation seeking than either those with one victimization experience or none at all. Women with multiple victimization histories were more likely to engage in several types of risky sexual behavior and endorse greater amounts of impulsive behavior. The Balloon Analogue Risk Task (BART) did not differentiate between the victimization groups and a significant relationship was not detected among other risk taking variables.

The current study, Study 2, consisted of three different follow-up contacts over the course of one year with one group of participants that completed all of Study 1 procedures, and an

additional group that completed all of the Study 1 procedures with the exception of the BART, the data collected from both groups being referred to hereafter as Time 1. Both groups consented to follow-up contact. Study 2 consisted of three distributions of an online survey at 2 months, 6 months, and 12 months from completion of the Study 1 session. Previously, Study 1 investigated the novel use of a behavior analogue task and the relationship between risk taking propensity, risky sexual behavior, and substance use with sexual victimization history. Study two sought to further investigate this relationship based on the findings from Study 1. Given that the previous study did not find a relationship between sexual victimization history and scores on the Balloon Analogue Risk Task, Study 2 sought to investigate if this task may demonstrate predictive utility over the follow-up periods in terms of sexually risky behavior and substance use, especially in those with a previous victimization history. Study one investigated the relationship between sexual victimization history, substance use, and sexually risky behavior. Study two sought to further investigate these relationships utilizing a longitudinal design to establish temporal relationships and identify which behaviors place women at the most risk across time.

The current study hypotheses include:

Question 1. Will higher scores of risk taking propensity (as measured by the BART) at Time 1 differentiate between participants with and without a previous victimization history (as measured by the PDS) at the 2, 6, and 12-month follow-ups?

Question 2. Will higher scores of risk taking propensity (as measured by the BART) at Time 1 predict risk taking behaviors such as substance use and sexual behavior (as measured by the SRS and SUQ) at the follow- up periods?

Question 3. Will substance use disordered behavior (as defined by the SASSI and SUQ) moderate the relationship between sexual risk behavior (as measured by the SRS), previous

sexual victimization (as measured by the PDS), and later sexual re-victimization (as measured by the PDS)?

Question 4. Will engaging in sexual risk behavior (as measured by the SRS) mediate the relationship between victimization history (as measured by the PDS) and later sexual re-victimization across time periods (as measured by the PDS)?

Question 5. As a hypothesized latent construct, will sexual sensation seeking (as measured by the SSSS) predict engagement in sexually risky behavior in women reporting victimization histories?

METHOD

Participants

The current study consisted of recruitment from two subgroups of participants, who participated in an initial session, referred to as Time 1 hereafter. One subgroup of participants were invited to participate after completion of the Study 1 session, following consent to a follow-up contact at the completion of data collection. A second subgroup of participants were recruited to participate in a modification of Study 1 procedures (they completed all Study 1 measures with the exception of the BART) and then were recruited for Study 2 using the same consent procedures as the first participant subgroup Study 2. At Time 1, potential participants were required to be female, a current WMU student, and at least 18 years old. Potential participants were recruited from various undergraduate courses and through flyers hung on campus. Potential participants were given the student investigator's email and laboratory phone number to contact if interested in learning more about participating in the study. Vouchers for extra credit were provided in the event that the student's instructor offered extra credit. The sub group of participants from Study 1, were eligible to receive one entry in a lottery drawing for every \$5 they earned during their participation in the Balloon Analogue Risk Task. The lottery drawing prize consisted of a Visa gift card in the amount of \$25. A list of the participant's name, preferred contact information (phone number or email), and number of entries into the drawing were stored separately from the research data in order to contact the participant in the event their name was selected from the drawing. A gift card drawing occurred at monthly intervals over the duration of Study 1. Participants were contacted through their preferred means of contact and asked to meet with the researcher to obtain the gift card. The second subgroup of Time 1 potential participants were not eligible, as the BART was not administered.

The first subgroup of participants were invited to complete the Balloon Analogue Risk Task (BART) and battery of self-report assessment in the Trauma Research Laboratory. The second subgroup were invited only to complete the battery of self-report measures and not the BART in the Trauma Research Laboratory. The BART was excluded from further research procedures given Study 1 results suggesting that BART did not demonstrate a statistically significant relationship with the other study variables. Following completion of the first session consisting of the self-report measures, as well as the BART for the first subgroup, the consent for follow-up contact was provided. If interested, participants were informed that signing the consent document allowed the researcher to contact them, but that they were not required to participate once contacted. Once informed consent was signed, the research assistant collected information in order to contact them at a later date. This included the participant's first name only, preferred email address, and information to assign a code. Participants were assigned a code based on birth month, first name initial, and age at Time 1. Participants were instructed that they would be reminded of the code formula within the text of the follow-up surveys.

In order to be eligible for participation in Study 2, participants had to be at least 18 years old, female, a Western Michigan University student, and must have completed Study 1 data collection. We collected data from 363 participants at Study 1. Of those 363 completing data collection at Study 1, 21% completed the two month follow-up; 13.8% have completed six-month follow-up; and 6.7% have completed one year follow-up. Lack of payment for participation in follow-up time periods and/or non-enrollment in a psychology course (extra credit slips for research participation are frequently not redeemable in other courses outside of the psychology department) at the time of follow-up survey may have impacted willingness to complete the follow-up online surveys. We did not collect data regarding the course from which

each participant was recruited during Time 1, however, anecdotally many students reported recruitment from a large introductory to psychology course that is offered both as a requirement for psychology majors as well as a general education option for other university majors. It is possible that participants enrolled in majors outside of psychology may have had reduced incentive to complete the follow-up surveys either due to lack of extra credit offered in courses or lack of interest in psychological research. Lastly, there was a break in data collection for approximately one year resulting in loss of follow-up data for some participants during this time period.

At Time 1, the mean participant age was 19.5 years old with a range of 18-26 years old. Six participants were excluded from analyses due to being outliers with respect to age. The majority of participants identified as freshmen or sophomore, single or in a dating relationship, White, and heterosexual. Participants at Time 1 were classified as nonvictimized, victimized in adulthood one time, or revictimized at multiple time points in adulthood. Participants at the follow-up periods were classified as non-victimized, victimized, and re-victimized both during a previous study time point and the current time point. Refer to Table 1 for participant descriptive statistics at each study period for both subgroups of participants.

<i>Table 1. Participant Descriptive Statistics</i>				
	Time one	2 month	6 month	12 month
Variable				
Age	19.55(1.56)	20.04(1.48)	20.07(1.42)	21(1.67)
Class standing	71.3% freshmen/sophomore	70.4% sophomore/junior	66.6% sophomore/junior	50% senior
Race	72.6% White	68.1% White	77.2% White	70.8% White
Relationship status	90.3% Single/in a dating relationship	82.2% Single/in a dating relationship	87.7% Single/in a dating relationship	58.3% Single/in a dating relationship
Sexual orientation	95.5% heterosexual	95.9% heterosexual	98.2% heterosexual	91.7% heterosexual
Residence	53.4% residence hall	47.9% house	52.6% apartment	50% house
Victimization status				
Non-victimized	33.40%	75.60%	0.00%	54.20%
Victimized	51.60%	0.00%	44.00%	8.30%
Re-victimized	15.00%	24.60%	56.00%	37.50%
Alcohol use	-	78.2% < 4 drinks	63% < 2 drinks	60.8% < 2 drinks
Drug use	-	87.9% None/Mild	100% None/Mild	87% None/mild
SASSI-3				
Substance dependent	42.90%	-	-	-
Substance abuse symptoms	3.87(2.43)	-	-	-
<i>Note.</i> Statistics are presented as <i>M(SD)</i> for continuous measures and “Prevalence Rate” (%) for dichotomous measures. Alcohol use = average amount consumed per occasion; Drug use = self-described drug use.				

Materials

Time one experimental session materials included a battery of self-reports measures including the Sexual Risky Survey, Sexual Sensation Seeking Scale, Marlow Crowne Social Desirability Scale, Personal Data Survey, Cognitive Appraisal of Risky Events, Sensation Seeking Scale, Substance Abuse Subtle Screening Inventory, Eysenck Impulsiveness Scale, and the Balloon Analogue Risk Task (BART). To complete assessment procedures, participants were

seated in one of the small therapy rooms located inside 2505 Wood Hall that contains a table, a desktop computer with a mouse, and writing utensils. The BART was administered first, for the first subgroup of participants in Time 1, in order to prevent potential fatigue due to completion of the self-report batteries. The order of administration of the self-report measures was counter balanced to minimize any order effects for both subgroups of participants. The student investigator and research assistants were blind to the participant's responses on the self-report measures throughout the duration of the subject's participation.

Study two materials included a battery of self-report measures administered utilizing a web-based survey procedure. Select self-report measures from Time 1 were included in the analyses. This included the Balloon Analogue Risk Task (BART), Sexual Risk Survey (SRS), Sexual Sensation Seeking Scale (SSSS), Subtle Substance Abuse Screening Inventory (SASSI), and Personal Data Survey (PDS). Participants that indicated interest at Time 1 were sent an email with a link to an online version of the SRS, PDS, and Substance Use Questionnaire (SUQ). The online survey was administered at approximately 2 months, 6 months, and 12 months from the date of participation in Time 1. The online versions of each self-report assessments contained the exact same questions as the paper and pencil version with the exception of the PDS. The PDS has been modified to inquire about sexual experiences since last contact with researchers.

Balloon Analogue Risk Task (BART; Lejuez, Read, Kahler, Richards, Ramsey, Stuart, Strong, & Brown, 2002). The BART was administered in Study 1 to the first subgroup of participants and was utilized for data analysis in Study 2. The BART is a computerized program that provides a behavioral measure of risk taking propensity. This measure involves engaging in risky behavior that may be rewarded up to a certain threshold at which time further riskiness will result in a higher probability of poorer outcomes. Persistent responding in terms of "balloon

pumps” increases monetary gains but also increases the risk of loss of accumulated short term earnings on each trial. This is similar to real-world situations in which a risky behavior may result in a short term reward but continued behavior in this manner increases the chance of more harmful, aversive outcomes. At Time 1, participants were seated in front of a computer screen that displayed a simulated balloon with a simulated balloon pump and a button labeled *Collect \$\$\$* that reset the current screen. In addition, two other display boxes are featured and are visible throughout the entire session. One display, *Total Earned*, lists the amount of money earned throughout the trial and the second, *Last Balloon*, lists the money earned on the last balloon. The task consisted of 30 balloon trials. Each balloon is “inflated” one degree with each balloon pump. This is equal to approximately .125” in all directions. Each balloon pump accrues 25 cents in the temporary bank. Each balloon has an explosion point, which if reached, resulted in the loss of the money in the temporary bank as displayed by the *Total Earned* box. The average explosion point of each balloon is 64 pumps but may range from 1 pump to 128 pumps. If a balloon has been pumped past its individual explosion point, a loud “pop” will be heard followed by the presentation of another balloon. Clicking on the *Collect \$\$\$* transferred the money accrued in the *Temporary Bank* to the permanent bank. When clicked, participants heard a slot machine payoff sound. Additional pumps resulted in the accumulation of money but also increased the risk of money lost if the balloon exploded as well as decreased the relative gain of each additional pump. One trial consisted of the presentation of a balloon and ended when the participant clicked on the *Collect \$\$\$* box or if the balloon exploded. Money was accrued in the temporary bank and viewable in the *Total Earned* box with each click on the simulated balloon pump.

Risk behavior as measured by the BART has been shown to be correlated with a number of real world risky behaviors such as cigarette smoking, MDMA abuse, alcohol use, aggression, theft, gambling, risky sexual behavior, and drug use (Hopko, Lejuez, Daughters, Aklin, Osborne, Simmons, & Strong, 2006; Lejuez, Aklin, Jones, Richards, Strong, Kahler, & Read, 2003; Lejuez, Read, Kahler, Richards, Ramsey, Stuart, Strong, & Brown 2002). The BART has shown good test- retest reliability over a period of approximately two weeks ($r = .77$) and a stability of mean risk behavior as measured by adjusted “balloon pumps” (number of pumps on balloons that did not explode) across time (White, Lejuez, & de Wit, 2008). Mean risk behavior was stable across multiple sessions in a period of two weeks with Pearson correlations between sessions consisting of $+ .66$ to $+ .78$ (White et al., 2002). A small increase in this analogue measure has also shown good convergent validity with self-report measures of impulsivity, sensation seeking, and lack of behavioral constraint (Lejuez et al., 2002). This behavior analogue measure was administered at Time 1 to the first subgroup of participants from Study 1 in order to provide a measure of general risk taking propensity.

Sexual Risk Survey (Turchik & Garske, 2009). The SRS was administered at both Time 1 and during Study 2. This 23 item self-report measure was developed to assess a range of sexually risky behaviors, behaviors the authors define as those that could lead to unintended pregnancies or Sexually Transmitted Infection (STI). The measure is comprised of five subscales: sexual risk taking with uncommon partners, risky sexual acts, impulsive sexual behaviors, intent to engage in risky sexual behaviors, and risky anal sexual acts. Content reliability was established by including revised items from other psychometrically sound measures of risk taking, conducting a review of the literature, and adding or comparing items provided by a sample of 72 college students from the pilot study. Good convergent validity has

been demonstrated through correlations with several other measures of risk taking. Good concurrent validity was demonstrated between higher scores on the SRS with greater health consequences related to sexual risk taking in past 6 months as well as a greater likelihood to incur greater lifetime health consequences. High internal consistency has been demonstrated with an alpha coefficient of .88 for all items. The five subscales have also demonstrated good internal consistency: sexual risk taking with uncommon partners ($\alpha = .88$), risky sexual acts ($\alpha = .80$), impulsive sexual behaviors ($\alpha = .78$), intent to engage in risky sexual behaviors ($\alpha = .89$), and risky anal sexual acts ($\alpha = .61$). Test retest reliability has been established over a period of two weeks with a reliability coefficient of .93 for the total measure and reliability coefficients for each subscale of: sexual risk taking with uncommon partners ($\alpha = .90$), risky sexual acts ($\alpha = .89$), impulsive sexual behaviors ($\alpha = .79$), intent to engage in risky sexual behaviors ($\alpha = .70$), and risky anal sexual acts ($\alpha = .58$). This scale was administered to provide a measure of type and frequency of risky sexual health behavior at Time 1 and was administered at each follow-up contact for this purpose.

Personal Data Survey (PDS; Naugle, 1999). The PDS has been administered in both Time 1 and Study 2. The PDS is a self-report inventory designed to gather standard demographic information such as age, ethnicity, relationship status, current dating and sexual practices, and past sexual victimization experiences (Naugle, 1999). The PDS was used to gather demographic information, identify victims of sexual aggression as well as to classify the nature of the sexual aggression experienced. In addition to the standard demographic questions, the PDS also includes select questions from *Wyatt Sexual History Questionnaire*, the *Sexual Experiences Survey* and *National Women's Study Victimization Screening* regarding the participants' sexual experiences prior to and after the age of 14.

1. Wyatt Sexual History Questionnaire (WSHQ). Items from the WSHQ are designed to retrospectively measure characteristics of childhood sexual abuse such as age of onset, duration, frequency, relationship to the perpetrator, use of force by the perpetrator, and presence of alcohol during the abusive event (Wyatt, 1985; Wyatt & Newcomb, 1990).

2. Sexual Experiences Survey (SES). SES is composed of ten items inquiring about different sexually aggressive experiences in terms of female respondents as victims of sexually aggressive acts and males as perpetrators of sexually aggressive acts.

Participants are asked to respond either yes or no. Scores on each question of this measure range from 4 to 0 with 4 indicating rape had been endorsed and 0 indicating no victimization reported. Adequate internal consistency is reported with an alpha coefficient of .74 for women. This measure has excellent test-retest reliability of .93 over a period of one week and has also demonstrated good construct reliability. The measure has a 1-week test-retest reliability of .93 and internal consistency reliability of .74 for female students (Koss & Gidycz, 1985). The last item of the SES was modified for the PDS by expanding it into three separate items. These items assess whether the participant experienced forced oral sex, anal sex, or penetration by fingers or objects (Koss, & Gidycz, 1985).

3. National Women's Study Victimization Screening (NWSVS). Items from the NWSVS use behaviorally specific definitions to assess risk factors for rape, physical assault, and events potentially related to the development of PTSD symptoms, as well as additional questions regarding the participant's age at the time of the event, how long it has been since the event occurred, and threat and injury that may have occurred during the event (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993).

This measure was administered at Time 1 in order to collect demographic information as well as history of unwanted experiences including frequency, type, substances involved, and perpetrator information. This measure was administered at follow-up sessions to provide information about subsequent victimization experiences since the date of last contact with researchers.

Subtle Substance Abuse Screening Inventory (SASSI-3; Lazowski, Miller, Boye, and Miller, 1998). The SASSI-3 was administered at Time 1 and was utilized for data analysis at Study 2. The SASSI-3 is a brief screening tool used to identify individuals who have a high probability of being diagnosed with a substance abuse disorder. In addition, this measure includes a scale to detect accuracy and willingness to acknowledge symptoms associated with a substance abuse diagnosis. This measure consists of 93 items, 67 of which consist of true/false responses, and 26 items that directly assess the frequency and duration of alcohol and drug use. The SASSI-3 is a widely used self-report measure designed to screen for substance abuse and dependence. It contains 10 indirect subscales consisting of items meant to indirectly discriminate between those with or without substance abuse or dependence problems. The SASSI-3 is composed of the following subscales: Symptoms of Substance Misuse (items that directly relate to substance misuse), Obvious Attributes (willingness to admit personal limitations and typical problems associated with substance abuse), Subtle Attributes (items that discriminated identified individuals in substance dependence treatment regardless of instructions to answer honestly or deceitfully), Defensiveness (differentiates those responding truthfully), Supplemental Addiction Measure (assists to determine further affirm defensiveness or specific substance abuse problems), Family vs. Control (identified those who were not substance-dependent themselves, but who had been a part of a family system affected by substance abuse), Correctional (identifies

those who are at risk for future legal problems), and Random Answering (identifies random answering). In addition, the SASSI-3 contains two face-valid subscales that assess alcohol and drug use separately. The two face-valid subscales provide a Likert rating scale of “never”, “once or twice”, “several times”, and “repeatedly”. This measure has demonstrated excellent test-retest reliability for each subscale, ranging from .92-1.00 and an overall alpha coefficient of .93. It has demonstrated an overall accuracy of 94% in discriminating between substance abuse and dependence respondents from those without a substance use disorder. In addition, the SASSI-3 has demonstrated good convergent validity with other screening measures and clinical assessment of substance abuse/dependence. This measure was used to assess substance abuse and dependence at Time 1.

Substance Use Questionnaire (SUQ) (Appendix A). The SUQ was administered during Study 2 procedures. The SUQ was designed by this student investigator in order to obtain information about the frequency and severity of substance use. Substance use questions were based on the National Institute on Alcohol abuse and Alcoholism's definition of a standard drink and consistent with other research studies on heavy episodic drinking and drug use (Eshelman, et al., 2015; Wechsler & Nelson, 2008). This measure inquires about average amount of use and time spent consuming both drugs and alcohol since the most recent contact with researchers. For example, at 2-month follow-up, participants were asked to reflect on their average use and days of use for the past two months. This measure was administered to assess alcohol and drug use pattern as well as identify binge use patterns.

Sexual Sensation Seeking Scale (SSSS; Kalichman, Johnson, Adair, Rompa, Multhauf, & Kelly, 1994; Gaither & Sellbom, 2003). The SSSS was administered at Time 1 and was utilized for data analysis in Study 2. The 11 item SSSS was originally developed for use with a

homosexual male sample but has also demonstrated good psychometric properties with a heterosexual college student sample (Gaither & Sellbom, 2003). Participants are asked to rate each response on a 4-point response format, ranging from 1 (Not at all like me) to 4 (Very much like me). This measure was designed to assess sexual sensation seeking which the researchers define as “the propensity to attain optimal levels of sexual excitement and to engage in novel sexual experiences”. This measure has demonstrated good internal consistency with an alpha coefficient of .81 for females. The SSSS has shown good convergent validity with other measures of sexual behavior and sensation seeking: Sexual Compulsivity Scale ($\alpha = .52$), Sexual Excitation Scale ($\alpha = .59$), and the Sexual Motivation Scale of the Multidimensional Sexuality Questionnaire ($\alpha = .63$). The SSSS has also shown discriminant validity in regards to negative correlations with measures of sexual depression, sexual anxiety, as well as internal and external sexual control. This measure was also correlated with number of total lifetime sexual behaviors ($\alpha = .49$). The SSSS was used to establish the propensity to engage in sensation seeking sexually as well as provide another measure of risky sexual health behavior.

Eysenck Impulsiveness Scale (I7; Eysenck, Pearson, Easting, & Allsop, 1985). This assessment was used in Study 1 only to establish a self-report measure of impulsivity, a construct that overlaps with measures of risk taking behavior and is hypothesized to include risk taking behavior as one feature of the construct. The impulsivity subscale of this measure is composed of 19 forced choice (yes or no) items. The impulsivity subscale measures the propensity to engage in impulsive behavior. Higher scores indicate a higher degree of impulsiveness. This scale demonstrates good internal consistency with an alpha coefficient of .83 for females.

Marlowe Crowne Social Desirability Scale (MCSDS; Crowne, & Marlowe, 1960). The MCSDS was used in Study 1 only. The MCSDS is a self-report measure designed to assess the

level of responding in a socially desirable manner either through the endorsement of overly positive characteristics or the denial of overly negative characteristics. It consists of 33 items in which participants respond either true or false to the statement. High internal consistency has been demonstrated with alpha coefficients of .88 and a high test-retest reliability of .89 has also been demonstrated with alpha coefficients of .88 at one month. The MCSDS was used to assess the impact of responding in a socially desirable manner on other self-report measures.

Cognitive Appraisal of Risky Events (CARE; Fromme, Katz, & Rivet, 1997). The CARE was used in Study 1 only. The CARE was constructed to measure beliefs about the consequences of certain risky activities that might result in temporally close, reinforcing outcomes as well as the expected and actual involvement in the listed risky activities. The assessment consists of 30 total listed activities and a total of 90 items. For each activity the participant is asked to rate the expected risk, expected benefit, and expected involvement. Participants are to rate each using a 7 point Likert response scale (1=not at all likely to 7=extremely likely). It is comprised of 6 factors: drug/illegal alcohol use, aggressive/illegal behavior, risky sexual activities, heavy drinking, high risk sports (i.e. caving, rock climbing), and academic/work behaviors (i.e. skipping class). It has been shown to demonstrate adequate test-retest reliability with reliability coefficients of .51 to .65 for *Expected Risk* and .58 to .79 for *Expected Benefit*. A reliability coefficient was not examined for *Expected Involvement* given the temporal element of the instruction. The CARE has also demonstrated adequate internal reliability (alpha coefficients of .64 to .90 depending on factor), criterion and construct validity. In this study, the CARE was used to assess beliefs and expectancies regarding risky activities.

Sensation Seeking Scale (SSS; Zuckerman, Eysenck, & Eysenck, 1978). The SSS was administered at Time 1 and the subscale, Disinhibition, was used for data analytic purposes in

Study 2. This measure consists of 40 pairs of opposite items in a forced choice format (scored as 1 or 0). Sensation seeking is conceptualized as the seeking of varied, novel, and complex sensations and experiences as well as a willingness to engage in risk taking behavior in order to obtain such experiences (Zuckerman, 1979). The SSS is composed of 4 subscales: Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Boredom Susceptibility (BS), and Disinhibition (DIS). The Sensation Seeking Scale has good internal consistency with alpha coefficients ranging from .83 to .86. Subscale reliabilities were as follows: TAS, .77-.82; ES, .61-.67; DIS, .74-.78, and BS, .56-.65. Test-retest reliability is .94 over a period of 3 weeks.

Procedure

Once finished with Time 1 materials, both subgroups of participant met either the student investigator or research assistant in the Trauma Research Laboratory. At this time, participants from the first subgroup of Time 1 were entered into the drawing for a Visa gift card based upon the amount of money earned on the BART. The second subgroup of participants never received the BART and thus were never entered in a Visa gift card drawing. Both subgroups of participants were also provided with a slip for extra credit indicating the hours of participation. Before leaving, the participant was provided with a list of referral services to various psychological clinics in Kalamazoo. The participant was then asked if they would be willing to consent to further follow-up surveys that span one year. If interested, the participants then signed the consent form for contact and provided their name, email address, and a personal code number for use at the Study 2 online surveys.

The online surveys were distributed utilizing Survey Monkey. Participants were required to indicate that they had read the informed consent document at each follow-up time point and

agreed to participate before they began the survey at the 2, 6, and 12-month follow-up sessions.

At the end of each survey, a web based extra credit slip was available to print.

RESULTS

After data entry was complete, all data was checked to ensure accuracy. Missing data analyses revealed that data were missing at random. Missing values on the SRS were replaced with the mean for the total scale for each participant in order to calculate scale scores. All SRS scales violated assumptions of normality as well as contained several outliers. As recommended by Tabacknik and Fidell (2013), significant outlier values were replaced with the value of the highest score prior to the outlier plus one. In addition, each scale was transformed using Logarithm. The results indicated that each scale more closely approximated the normal curve. If statistical analyses as conducted for each individual analysis indicated violation of homoscedascity, the appropriate alterations were taken for that particular statistic and has been detailed. In addition, some analyses excluded evaluation of 6-month data given that all respondents at this follow-up time period indicated experiencing some form of unwanted sexual experience. See Table 2 for means and standard deviations of Study 2 variables.

Question 1

Will higher scores of risk taking propensity (as measured by the BART) at Time 1 differentiate between participants with and without a previous victimization history (as measured by the PDS) at the follow-up periods?

An independent samples t-test was conducted to compare the Time 1 BART scores between women who did and did not indicate a victimization experience at the 2-month follow-up. There was no significant difference in scores for non-victimized females ($M = 25.55$, $SD = 12.85$) and victimized females ($M = 22.26$, $SD = 12.57$); $t(54) = .84$, $p = .41$, two-tailed). Results indicate no difference in general risk taking propensity between the victimization groups.

Table 2. Means and Standard Deviations for Study Variables				
	Time one	2 month	6 month	12 month
Variable				
BART				
AAP	27.98(12.84)	-	-	-
Explosions	6.7(3.97)	-	-	-
Sexual Sensation Seeking	23.84(6.33)	-	-	-
Disinhibition	5.45(1.32)	-	-	-
Sexual Risk Survey		-	-	-
Total	75.91(102.05)	45.05(55.97)	29.02(24.09)	88.83(130.61)
Sex with uncommitted partners	9.91(15.16)	9.78(17.04)	6.95(9.55)	7.42(10.46)
Impulsive sexual behavior	6.36(8.08)	5.09(9.99)	5.56(8.28)	5.47(6.56)
Substance abuse symptoms	3.87(2.43)	-	-	-
Note. Statistics are presented as <i>M(SD)</i> .				

An independent samples t-test was conducted to compare the BART scores between women who did and did not indicate a victimization experience at the 12-month follow-up. There was no significant difference in scores for non-victimized females ($M = 27.32$, $SD = 15.57$) and victimized females ($M = 26.27$, $SD = 11.65$); $t(20) = .17$, $p = .87$, two-tailed). Results indicate no difference in general risk taking propensity between the victimization groups. See Table 3 for a summary of t-test results for victimized and non-victimized females in BART scores.

Table 3. Results of t-Tests and Descriptive Statistics for Bart by Victimization Group								
	Group							
	Non-victimized			Victimized			95% CI for Mean Difference	t
	M	SD	N	M	SD	N		
Two Month	25.55	12.85	42	22.26	12.57	14	4.62 11.20	.84
Twelve Month	27.32	15.57	13	26.27	11.65	9	11.73, 13.84	.17
* $p < .05$								

Question 2

Will higher scores of risk taking propensity (as measured by the BART) at Time 1 predict risk taking behaviors such as substance use and sexual behavior (as measured by the SRS and SUQ) at follow-up?

The relationship between risk taking propensity (as measured by the BART at Time 1) and risky sexual behavior (as measured by the SRS) was investigated using Pearson Product-moment correlational analyses. Preliminary analyses were performed to ensure no violation of linearity, homoscedasticity, and normality. There was no correlation between risk taking propensity and risky sexual behavior at the follow-up periods. See Tables 4, 5, and 6 for Pearson Product-moment correlation coefficients between the BART and scales of the SRS at each follow-up time period.

<i>Table 4. Pearson Product-Moment Correlation Coefficients between the BART and SRS at 2-Month Follow-Up</i>				
	BART	SRS- Sex with uncommitted partners	SRS- Impulsive sexual behavior	SRS- total
BART	1	0.03	-0.22	-0.17
SRS- Sex with uncommitted partners	0.03	1	.42**	.61**
SRS- Impulsive sexual behavior	-0.22	.42**	1	.61**
SRS- total	-0.17	.61**	.50**	1
** $p < .01$ (2-tailed)				

A one-way between-groups analysis of variance was conducted to explore the relationship between the BART and substance use behavior at 2-month follow-up, as measured by the SUQ (mild, moderate, severe use). There was not a statistically significant difference at the $p < .05$ level in a BART scores for the three groups: $F(2,48) = .22$ $p = .81$.

<i>Table 5. Pearson Product-Moment Correlation Coefficients between the BART and SRS at 6-Month Follow-Up</i>				
	BART	SRS- Sex with uncommitted partners	SRS- Impulsive sexual behavior	SRS- total
BART	1	0.18	-0.14	0.1
SRS- Sex with uncommitted partners	0.18	1	.50**	.52**
SRS- Impulsive sexual behavior	-0.14	.50**	1	.60**
SRS- total	0.1	.52**	.60**	1
** $p < .01$ (2-tailed)				

<i>Table 6. Pearson Product-Moment Correlation Coefficients between the BART and SRS at 12-Month Follow-Up</i>				
	BART	SRS- Sex with uncommitted partners	SRS- Impulsive sexual behavior	SRS- total
BART	1	0.34	0.07	-.46
SRS- Sex with uncommitted partners	0.34	1	0.51	0.15
SRS- Impulsive sexual behavior	-0.07	0.51	1	0.5
SRS- total	-0.46	0.15	0.5	1
** $p < .01$ (2-tailed)				

A one-way between-groups analysis of variance was conducted to explore the relationship between the BART and substance use behavior at 6-month follow-up, as measured by the SUQ (mild, moderate, severe use). There was not a statistically significant difference at the $p < .05$ level in a BART scores for the three groups: $F(2,39) = 1.61$ $p = .21$.

A one-way between-groups analysis of variance was conducted to explore the relationship between the BART and substance use behavior at 12-month follow-up, as measured by the SUQ (mild, moderate, severe use). There was not a statistically significant difference at

the $p < .05$ level in a BART scores for the three groups: $F(2,18) = 1.92$ $p = .18$. See Table 7 for a summary of One Way between Groups ANOVA for the BART and average substance use.

<i>Table 7. Summary of One Way between Groups ANOVA for the BART and Average Substance Use</i>					
	Mild	Moderate	Severe	F	p
Adjusted Average Pumps					
2-month follow-up	26.48 (12.8)	24.45 (10.93)	23.85 (14.23)	0.22	0.8
6-month follow-up	23.08 (9.42)	28.63 (17.90)	31.75 (9.93)	1.62	0.21
12-month follow-up	28.66 (13.3)	14.75 (7.89)	28.02 (13.18)	1.92	0.18
<i>Note.</i> Mild = < 2 drinks; Moderate = 3-4 drinks; Severe = > 5 drinks on an average drinking occasion.					

Question 3

Will substance use disordered behavior (as defined by the SASSI and SUQ) moderate the relationship between sexual risk behavior (as measured by the SRS), previous sexual victimization (as measured by the PDS), and later sexual re-victimization (as measured by the PDS)?

A Chi-square test for independence was conducted to explore the relationship between victimization status at Time 1 and classification of substance use (mild, moderate, severe) according to the SUQ at 2, 6, and 12-month follow-up. The Chi-Square test for independence did not indicate a significant association between sexual victimization status at Time 1 and substance use at 2-month follow-up $X^2(4, n=64) = .785, p = .10, \phi = .10$, 6-month follow-up $X^2(4, n=55) = 3.68, p = .45, \phi = .45$, nor the 12-month follow-up $X^2(4, n=23) = 2.59, p = .63, \phi = .63$. Participants with victimization histories were not more likely to report problematic substance use at the follow-up periods than those without a history of sexual victimization.

Discriminant function analysis was conducted to discover and interpret the combinations of variables that may predict sexual victimization status at the follow-up periods. Sequential discriminant function analysis was conducted using variables that demonstrated a significant relationship with victimization status at Study 1. This includes evaluation of the SASSI-3 substance dependence classification, the SASSI-3 symptoms of substance abuse scale, victimization at Time 1 (as measured by the PDS), sexual risk taking with uncommitted partners (as measured by the SRS scale one at Time 1), and impulsive sexual behavior (as measured by the SRS scale 3 at Time 1).

A discriminant function analysis was conducted to determine if problematic substance use, as measured by the two scales on the SASSI-3, predicted victimization status at the 2 or 12-month follow-ups (victimized or non-victimized). The values included likelihood of being or not being classified as substance dependent and the scale of symptoms of substance abuse. The first function did not significantly differentiate the groups at 2-month follow-up, Wilks' Lambda = .96, Chi square (2) = 2.15, $p < .34$. The structure matrix and group centroids for the first function are presented in Table 8 and 9, respectively. In addition, the first function did not significantly differentiate the groups at 12-month follow-up, Wilks' Lambda = .93, Chi square (2) = 1.40, $p < .50$. The structure matrix and group centroids for the first function are presented in Table 10 and 11, respectively. According to sequential discriminant function analysis, problematic substance use did not predict likelihood of victimization status at 2 or 12-month follow-up. While discriminant function analysis could not be performed using data from the 6-month follow-up respondents, it is notable that 46% of participants reporting revictimization experiences were classified as substance dependent by the SASSI-3 at Time 1 in comparison to 23% of those reporting one victimization experience during the study period.

<i>Table 8. Structure Matrix for Victimization Status and Problematic Substance Use</i>	
	Function
	1
<i>Substance dependence</i>	0.88
<i>Symptoms of substance abuse scale</i>	0.07

<i>Table 9. Group Centroids for Each Victimization Group and Problematic Substance Use</i>	
	Function
	1
Non-victimized	-0.11
Victimized	0.33

<i>Table 10. Structure Matrix for Victimization Status and Problematic Substance Use</i>	
	Function
	1
Substance dependence	0.81
Symptoms of substance abuse scale	0.83

<i>Table 11. Group Centroids for Each Victimization Group and Problematic Substance Use</i>	
	Function
	1
Non-victimized	-0.25
Victimized	0.27

Question 4

Will engaging in sexual risk behavior (as measured by the SRS) mediate the relationship between victimization history (as measured by the PDS) and later sexual re-victimization across time periods (as measured by the PDS)?

A one-way between-groups analysis of variance was conducted to explore the impact of sexual victimization status, as measured by the PDS, on sexual risk taking behavior, as measured by several scales of the SRS including the uncommitted partners, impulsive sexual behaviors, and total scales, at the 2, 6, and 12-month follow-ups. Participants were divided into three groups according to victimization status including non-victimized, victimized one time, and revictimized. There was not a statistically significant difference at the $p < .05$ level for any of the analyses. See Tables 12,13, and 14 for summaries of the ANOVA analyses.

A discriminant function analysis was conducted to determine if sexually risky behavior (as measured by the total scale of the SRS, scale one of the SRS, and scale three of the SRS at Time 1), predicted victimization status at the 2 and 12-month follow-ups (victimized or non-victimized). The values included the extent to which participants reported engaging in a sexually risky behavior. The first function did not significantly differentiate the groups at 2-month follow-up, Wilks' Lambda = .89, Chi square (3) = 4.15, $p < .25$. The structure matrix and group centroids for the first function are presented in Table 15 and 16, respectively. In addition, the first function did not significantly differentiate the groups at 12-month follow-up, Wilks' Lambda = .77, Chi square (3) = 1.90, $p < .59$. The structure matrix and group centroids for the first function are presented in Table 17 and 18, respectively. According to sequential discriminant function analysis, risky sexual behavior did not predict likelihood of victimization status at 2 or 12-month follow-up.

<i>Table 12.</i> Summary of One Way between Groups ANOVA for the Sexual Risk Survey Total Scale and Sexual Victimization Status at Follow-Up					
	Nonvictim- ized	Victimized	Revictim- ized	F	p
Sexual Risk Survey-Total Scale					
2-month follow-up	1.09 (.82)	1.35 (.66)	1.62(.43)	1.9	0.16
6-month follow-up	1.35 (.43)	1.30 (.53)	1.19 (.59)	0.18	0.83
12-month follow-up	1.02(.34)	1.78(.56)	1.74(.19)	1.99	0.18

<i>Table 13.</i> Summary of One Way between Groups ANOVA for Sexual Risk Taking with Uncommitted Sexual Partners Scale of the SRS and Sexual Victimization Status at Follow-Up					
	Nonvictim- ized	Victimized	Revictim- ized	F	p
Sexual Risk Survey- Sexual Risk Taking with Uncommitted Partners Scale					
2-month follow-up	.65(.19)	.66(.10)	.84(.19)	0.39	0.68
6-month follow-up	.51(.55)	.58(.59)	.55(.67)	0.06	0.94
12-month follow-up	.30(.52)	.57(.80)	.83(.55)	0.40	0.67

Table 14. Summary of One Way between Groups ANOVA for Impulsive Sexual Behavior Scale and Sexual Victimization Status at Follow-Up

	Nonvictim- ized	Victimized	Revictim- ized	F	p
Sexual Risk Survey- Impulsive Sexual Behavior Scale					
2-month follow-up	.38(.41)	.56(.45)	.76(.74)	.46	.64
6-month follow-up	.54(.51)	.60(.58)	.01(.58)	2.37	.11
12-month follow-up	.50(.51)	.54(.51)	.81(.36)	1.36	.27

Table 15. Structure Matrix for Victimization Status and Sexual Risk Behavior

	Function
	1
Total sexual risk behavior	0.93
Sexual behavior with uncommitted partners	0.47
Impulsive sexual behavior	-0.15

Table 16. Group Centroids for Each Victimization Group and Sexual Risk Behavior

	Function
	1
Non-victimized	-0.21
Victimized	0.58

<i>Table 17.</i> Structure Matrix for Victimization Status and Sexual Risk Behavior	
	Function
	1
Total sexual risk behavior	-0.36
Sexual behavior with uncommitted partners	0.2
Impulsive sexual behavior	0.2

<i>Table 18.</i> Group Centroids for Each Victimization Group and Sexual Risk Behavior	
	Function
	1
Non-victimized	0.37
Victimized	-0.64

Question 5

As a hypothesized latent construct, will sexual sensation seeking (as measured by the SSSS) predict engagement in sexually risky behavior in women reporting victimization histories?

A discriminant function analysis was conducted to determine if sexual sensation seeking, as measured by the Sexual Sensation Seeking Scale, or disinhibition, as measured by the Disinhibition scale of the Sensation Seeking Scale, predicted victimization status at the 2- and 12-month follow-ups (victimized or non-victimized). The values included the extent to which a participant reported seeking optimal levels of sexual excitement and a preference for varied and novel experiences. The first function did not significantly differentiate the groups at the 2-month

follow-up, Wilks' Lambda = .94, Chi square (2) = 3.58, $p < .17$. The structure matrix and group centroids for the first function are presented in Table 19 and 20, respectively. In addition, the first function did not significantly differentiate the groups at 12-month follow-up, Wilks' Lambda = .99, Chi square (2) = 2.01, $p < .90$. The structure matrix and group centroids for the first function are presented in Table 21 and 22, respectively. According to sequential discriminant function analysis, problematic substance use did not predict likelihood of victimization status at 2- or 12-month follow-up.

Table 19. Structure Matrix for Victimization Status, Sexual Sensation Seeking, and Disinhibition

	Function
	1
Disinhibition	0.75
Sexual sensation seeking	-0.5

Table 20. Group Centroids for Each Victimization Group, Sexual Sensation Seeking, and Disinhibition

	Function
	1
Non-victimized	0.16
Victimized	-0.43

Table 21. Structure Matrix for Victimization Status, Sexual Sensation Seeking, and Disinhibition

	Function
	1
Disinhibition	-0.61
Sexual sensation seeking	0.84

<i>Table 22. Group Centroids for Each Victimization Group, Sexual Sensation Seeking, and Disinhibition</i>	
	Function
	1
Non-victimized	0.1
Victimized	-0.11

Additional Analyses

Several additional analyses were conducted in order to investigate similarity of this sample to samples from previous literature, as well as evaluate differences in those who responded to the follow-up measures. A Chi-square test for independence was conducted to explore the relationship between victimization status at Time 1 and class standing at Time 1 (freshmen, sophomore, junior, senior, grad/professional) given previous evidence that suggested the freshmen year tends to be a particular vulnerable period for sexual victimization. The Chi-Square test for independence did not indicate a significant association between sexual victimization status at Time 1 and class standing $X^2(8, n=353) = 11.71, p = .17$. Freshmen and sophomore students were not more likely to report sexual victimization experiences than the other class standings. In addition, independent samples t-test indicated that participants did not differ with respect to age between those who did not respond to 2-month follow-up ($M = 19.5$, $SD = 1.55$) and responders to the 2-month follow-up ($M = 19.73$, $SD = 1.61$; $t(355) = -1.10, p = .37$, two-tailed) nor between nonresponders at 12-month follow-up ($M = 19.39$, $SD = 1.68$) and responders ($M = 19.39$, $SD = 1.31$; $t(355) = .51, p = .18$, two-tailed). However, according to independent samples t-tests, participants that responded to the 6-month follow-up ($M = 19.20$,

SD = 1.07) were slightly younger than those whom did not respond (M = 19.61, SD = 1.62; $t(355) = 1.73, p = .001$, two-tailed).

Several paired-samples t-tests were conducted to evaluate the consistency of sexual behavior (as measured by the SRS) between the follow-up periods. There was not a statistically significant difference in sexual behavior with uncommitted partners scores from Time 1 (M = .83, SD = .60) to 2-month follow-up (M = .71, SD = .59) $t(43) = 1.63, p < .11$ (two-tailed), from Time 1 (M = .72, SD = .63) to 6-month follow-up (M = .57, SD = .57) $t(39) = .150, p < .14$ (two-tailed), nor from Time 1 (M = .49, SD = .45) to 12-month follow-up (M = .59, SD = .53) $t(10) = -.51, p < .62$ (two-tailed). Similarly, there was not a statistically significant difference in scores from Time 1 (M = .61, SD = .38) to 12-month follow-up (M = .67, SD = .13) $t(13) = -.57, p < .58$ (two-tailed) in impulsive sexual behavior. In addition, there was not a statistically significant difference in scores from Time 1 (M = 1.36, SD = .65) to 12-month follow-up (M = 1.56, SD = .52) $t(10) = -1.32, p < .22$ (two-tailed) in general sexual risk taking behavior.

A Chi-square test for independence (with Yates Continuity Correction) was conducted to explore the relationship between participants that responded to the 2-month follow-up with regard to classification as substance dependent by the SASSI-3. The Chi-Square test for independence did not indicate a significant association between participants that responded at Time 1 and those that did not respond to 2-month follow-up $X^2(1, n=303) = .11, p = .74, phi = -.03$; at 6-month follow-up $X^2(1, n=303) = .12, p = .86, phi = .03$; nor at 12-month follow-up $X^2(1, n=303) = .67, p = .55, phi = -.36$. There were no differences between responders and nonresponders in terms of problematic substance use at any of the follow-up periods.

Several independent-samples t-tests were conducted to evaluate potential differences between those who participated in Time 1 data collection and those who either responded or did

not respond to follow-up. There was not a statistically significant difference at 2-month follow-up in nonresponders scores with regard to Time 1 substance abuse symptoms as measured by the SASSI-3 ($M = 3.93$, $SD = 2.47$) and responders ($M = 3.71$, $SD = 2.33$; $t(293) = .67$, $p = .57$, two-tailed), nor in 6-month follow-up nonresponders ($M = 3.89$, $SD = 2.47$) and responders ($M = 3.88$, $SD = 2.25$; $t(293) = -.01$, $p = .53$, two-tailed), nor in 12-month follow-up nonresponders ($M = 3.94$, $SD = 2.45$) and responders ($M = 3.08$, $SD = 2.07$; $t(293) = 1.63$, $p = .82$, two-tailed).

Similarly, there was not a statistically significant difference at 2-month follow-up in nonresponders scores with regard to Time 1 impulsivity as measured by the I7 ($M = 8.40$, $SD = 4.19$) and responders ($M = 9.10$, $SD = 3.88$; $t(324) = -1.22$, $p = .68$, two-tailed), nor in 6-month follow-up nonresponders ($M = 8.65$, $SD = 4.14$) and responders ($M = 7.96$, $SD = 4.11$; $t(324) = 1.06$, $p = .89$, two-tailed), nor in 12-month follow-up nonresponders ($M = 8.61$, $SD = 4.12$) and responders ($M = 7.55$, $SD = 4.36$; $t(324) = 1.12$, $p = .435$, two-tailed).

Lastly, there was not a statistically significant difference at 2-month follow-up in nonresponders scores with regard to Time 1 sexual risk behavior as measured by the total scale of the Sexual Risk Scale ($M = 1.57$, $SD = .60$) and responders ($M = 1.53$, $SD = .67$; $t(274) = .44$, $p = .62$, two-tailed), nor in 6-month follow-up nonresponders ($M = 1.57$, $SD = .62$) and responders ($M = 1.54$, $SD = .57$; $t(308) = -.64$, $p = .80$, two-tailed), nor in 12-month follow-up nonresponders ($M = 1.57$, $SD = .62$) and responders ($M = 1.45$, $SD = .52$; $t(274) = .81$, $p = .26$, two-tailed).

Paired samples t-tests did indicate differences on some follow-up measure scales during the follow-up time period. There was a statistically significant difference in impulsive sexual behavior scores from Time 1 ($M = .74$, $SD = .41$) to 2-month follow-up ($M = .56$, $SD = .50$) $t(41) = 2.33$, $p < .03$ (two-tailed). The mean decrease in impulsive sexual behavior was .18 with a 95%

confidence interval ranging from .02 to .34. The eta squared statistic (.11) indicated a moderate, nearly large, effect size. In addition, there was a statistically significant difference in general sexual risk behavior scores from Time 1 ($M = 1.59$, $SD = .67$) to 2-month follow-up ($M = 1.31$, $SD = .73$) $t(47) = 3.42$, $p < .001$ (two-tailed). The mean decrease in general sexual risk behavior was .28 with a 95% confidence interval ranging from .12 to .45. The eta squared statistic (.20) indicated a large effect size. There was a statistically significant difference in impulsive sexual behavior scores from Time 1 ($M = .72$, $SD = .39$) to 6-month follow-up ($M = .46$, $SD = .59$) $t(35) = 2.31$, $p < .03$ (two-tailed). The eta squared statistic (.15) indicated a large effect size. Impulsive sexual behavior occurred at a lower frequency in the 6-month follow-up than at Time 1. Similarly, there was a statistically significant change in general sexual risk taking scores from Time 1 ($M = 1.57$, $SD = .57$) to 6-month follow-up ($M = 1.29$, $SD = .51$) $t(40) = -2.64$, $p < .01$ (two-tailed). The mean decrease in general sexual risk behavior was .28 with a 95% confidence interval ranging from .07 to .50. The eta squared statistic (.15) indicated a large, effect size.

DISCUSSION

Consistent with results from Study 1, the findings in the current study did not reveal any statistically significant difference between women with victimization histories and those without in terms of risk taking propensity as measured by the BART. In addition, consistent with Study 1, no statistically significant relationship between the BART and other study variables including sexual risk behavior or substance use was detected. According to a 2014 meta-analysis examining the relationship between the BART, impulsivity, and sensation seeking, the BART has demonstrated an inconsistent relationship, with small to moderate effect sizes, with measures of sensation seeking and impulsivity (Lauriola, Panno, Levin, & Lejuez, 2014). Lauriola et al., (2014) discuss the overabundance of studies utilizing psychiatrically disordered samples as well as socially deviant individuals, thus creating a limited understanding of the relationship between risk taking propensity, impulsivity, and sensation seeking in less severe and more varied populations. In addition, these researchers found that a majority of studies reported samples with means of the adjusted average pumps that fell below 64 pumps, the threshold for maximized earnings, with means between 24.6 and 44.10. The current study sample demonstrated a mean of 27.98 with a standard deviation of 12.84, indicating that the current sample was also responding below the threshold of balloon pumps necessary to increase the likelihood of earning maximum “money.” This meta analysis of the empirical BART literature noted smaller effect sizes with high school students and undergraduate students as well as with less ethnically diverse samples. The current sample largely consisted of White, undergraduate female students. With regard to past research and our findings, it is currently unclear what aspects of risk taking the BART reliably measures (Aklin, et. al., 2005; Lauriola et al., 2014). Current study results suggest that the BART may not be an appropriate method for measuring or predicting several types of risky

behaviors in this college female sample. Although the BART has demonstrated small to moderate strength in differentiating impulsivity and sensation seeking in certain populations, it may not be the most accurate behavioral task by which to measure risk taking propensity in the college female population.

The current study did not find a statistically significant relationship between risky sexual behavior, substance abuse, and a greater likelihood for the experience of sexual victimization at follow-up periods, contrary to initial hypotheses that risky sexual behavior, sexual sensation seeking, and substance use would be associated with a greater likelihood of sexual victimization at the follow-up periods. Study 1 indicated a strong relationship between sexual risk behavior, substance use, and sexual sensation seeking with victimization, in particular with revictimization experiences. Neither risky sexual behavior nor higher levels of sexual sensation seeking were associated with likelihood of revictimization at the Time 2 follow-up periods. In Study 1, victimized females were significantly more likely to report sexual behavior with uncommitted partners, impulsive sexual behavior, and general risky sexual behavior as compared to non-victimized females. Additional analyses for Study 2 revealed that participants who responded to follow-up surveys at both the 2- and 6-month follow-up periods reported significantly less general risky sexual behavior as well as impulsive sexual behavior than participants at Time 1. Analyses did not detect a difference in sexual behavior with uncommitted partners. Consistent with Time 1 findings, a recent study found women with multiple victimization experiences were more likely to engage in risky sexual behavior during a vignette task without regard to relationship potential with the perpetrator (Bryan, Norris, Abdallah, Stappenbeck, Morrison, Davis...2016). Interestingly, the Bryan et al study also revealed an inconsistent effect following administration of alcohol to participants. Participants consumed alcohol to a BAC of .10%, thus

closely approximating real-world college situations. Alcohol demonstrated both a positive effect and an attenuating effect on risky sexual behavior. Alcohol consumption that resulted in an increase in positive mood also resulted in an increase in risky sexual behavior while alcohol consumption was also associated with a reduction in sexual desire that decreased risky sexual behavior.

While problematic substance use was not associated with a greater likelihood of sexual victimization at the Study 2 follow-up periods, it is noteworthy that 46% of females who reported multiple victimization experiences at follow-up were likely to meet criteria for a substance dependence diagnosis at Time 1 as compared to 23% of females with one victimization experience during follow-up. Previous literature has revealed similarly strong associations between the aforementioned factors and sexual victimization while also indicating an inconsistent or nonexistent predictive relationship with regard to sexual victimization experiences (Testa, Livingston, & Hoffman, 2007; Ullman & Najdowski, 2009; Ullman, 2016). A study of substance abuse and PTSD symptoms in women with sexual victimization histories, found that PTSD symptoms did not directly influence problem drinking at one and two year follow-ups and problematic drinking did not have a direct effect on PTSD symptoms, although problem drinking had been correlated with each variable during the follow-up time periods (Ullman, 2016). Previous literature has indicated that alcohol use remains one of the strongest known contextual determinants of risky behavior (Cooper, 2010). In addition, approximately 88% of adult sexual assaults involved substance use and women frequently underestimate alcohol use as one of the primary facilitators of sexual assault (Littleton et al., 2009; Messman-Moore et al., 2008).

Despite the Study 2 longitudinal results, prior literature and Study 1 results are consistent regarding a cycle of vulnerability in women who engage in risky levels of drinking, experience sexual victimization, and subsequently continue or increase their drinking, resulting in an elevated risk for revictimization (Parks, et al., 2014). Of note, the current study sample tended to report lower average alcohol consumption patterns and risky sexual behavior at follow-up periods as compared to Time 1. These sample characteristics in combination with high attrition rates may have impacted our ability to detect a significant relationship between sexual victimization, risky sexual behavior, and substance use. It is also possible that, given the contextual nature of the risk factors of interest, lengthier follow-up periods may be necessary to determine the strongest combination of risk factors common to sexual victimization experiences.

Consistent with the contextual nature of substance use risk, a recent study investigating the use of alcohol over 12 drinking occasions utilizing diary recording during all weekends and high likelihood drinking times, indicated that when individuals consumed alcoholic beverages in excess of their typical limit they also tended to report experiencing more sex-related consequences such as risky sexual behavior and unwanted sexual experiences (Scaglione, Turrisi, Mallett, Ray, Hultgren, Cleveland, 2014). These results suggest that consumption above one's typical frequency is an important contextual factor in alcohol use. Alarming, each additional drink was associated with a 13% increase in the likelihood of experiencing a negative sex-related consequence. At particular risk were individuals with a history of sexual victimization as these individuals experienced sex-related consequences at a rate of nearly 2.5 times higher than individuals without a sexual victimization history. Females with sexual victimization histories were nearly ten times more likely to experience consequences on occasions they reached higher than average levels of intoxication compared to those without. In

addition, mean levels of drinking did not significantly predict sex-related consequences, further suggesting that excessive alcohol consumption at an individual level may be an important risk factor. After analyzing estimated BAC rather than number of drinks, study results indicated that individuals with higher estimated BAC's across the 6 weeks tended to experience more consequences in general. As such, prevention programming that seeks to limit the number of drinks one consumes to the individual's average may not fully protect individuals, given that participants with higher BAC's were still at a higher risk for sex-related consequences even when consuming at their average consumption level. In other words, prevention programming that targets alcohol use may need to not only include individualized feedback regarding alcohol use but also in the types of behaviors one engages in to avoid risk to oneself. For example, a female that may continue to engage in a heavier binge drinking pattern may benefit from individualized feedback that aims to increase safety from risk in the context of a higher BAC as opposed to a female that is interested in restricting alcohol intake to lower BAC limits.

The routine activities theory states that crime, such as sexual victimization, stems from the intersection of multiple contextual factors (Cohen & Felson, 1979). While the literature and Study 1 have demonstrated a strong relationship between problematic substance use, risky sexual behavior, and sexual victimization, a single or group of strong predictors is yet to be demonstrated. It may be more likely that sexual victimization, like other crimes, results from the intersection of multiple, correlated, contextual factors. One avenue of further research pursuit may be the investigation of interventions that address consistently correlated risk factors such as substance use and sexual risk behavior. In fact, Gilmore et al. (2015) created a combined intervention that simultaneously targeted both heavy episodic drinking and sexual assault risk reduction. Consistent with previous research, previous victimization experience and average

drinking were consistent risk factors for experiencing sexual assault at the 3 month follow-up. Their results showed a significant reduction in incapacitated rapes, sexual assault incidence and severity, and frequency of HED for women with severe assault histories. Discouragingly, the use of protective behavioral strategies did not increase as a result of the intervention. Instead, the best predictor of the use of behavioral protective strategies was the use of protective behavioral strategies at baseline. The researchers hypothesize that more personalized prevention programming may be needed.

Existing sexual assault risk reduction programs have several important limitations. The first is insufficient tailoring and targeting (Gilmore, Lewis, George, 2015). Prevention programming tends to include general sexual assault education but does not target high risk women, such as women with sexual assault histories. Secondly, heavy episodic drinking is not targeted using evidenced based methodology. Much of college prevention programming is focused on psychoeducation regarding the harm of alcohol use and offering services to those concerned about their own alcohol use (U.S. Department of education, 2008). Lastly, interventions rarely target the high risk group of women who consume alcohol and have a sexual assault history (Gilmore, et al., 2015). While sexual assault risk reduction programs are effective in changing knowledge, behavioral intent, and attitudes, they have generally been ineffective at decreasing combined alcohol and sexual assault incidence or increasing the use of effective strategies (Gilmore, et al., 2015). Therefore, it is essential to focus on risk perception, resistance strategies, and barriers to resistance, with alcohol use and risky sexual behavior reduction as a component of that strategy.

Several limitations exist for the current study. First, the high attrition rates at each follow-up period resulted in a limited interpretation of the current results. Second, that one of our three

follow-up samples consisted solely of women reporting experiencing an unwanted sexual experience during that follow-up period, limiting comparison for analyses that required a comparison with a non-victimized group. The follow-up samples also tended to report consuming less than 4 drinks per average drinking occasion as well as less risky sexual behavior than participants at Time 1, indicating that the respondents to the follow-ups were less risky in terms of substance abuse and risky sexual behavior.

Future research exploring effective and cost efficient intervention programming may lend to a better understanding of the interaction of the multitude of risk factors that increase vulnerability for sexual victimization with the benefit of potentially increasing protective factors as a result of experimental interventions. Interventions such as Brief Alcohol Screening and Intervention for College Students (BASICS) has demonstrated success in reducing alcohol consumption as well as harm related to drinking (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001). While this intervention is not aimed specifically at reducing sexual victimization occurrence, BASICS provides psychoeducation and feedback regarding alcohol use and harm that is personalized to the participant, thus making it a potentially beneficial intervention that may be effective for a variety of college students. Given that alcohol use is consistently associated with victimization experiences, it may benefit both males and females to receive psychoeducation regarding alcohol, metabolism of alcohol, drinking safely, and when to identify problem patterns so as to simultaneously reduce risk for adverse consequences such as sexual victimization as well as to impact those who may be managing distress related to sexual victimization experiences through the use of substances. In addition, interventions aimed at increasing sexual assertiveness and sexual discussion may increase comfort in discussion of sexual topics as well as aid in identifying potentially dangerous situations prior to escalation in

which escape is more difficult. These types of interventions may be especially beneficial as they address both personal risk factors that one may immediately impact as well as take into consideration the common context in which victimization tends to occur, namely with people and situations in which the victim has familiarity.

Given that freshmen and sophomore females appear to be the most vulnerable to victimization, it may be beneficial to investigate the use of interventions targeted at freshmen and sophomore students. Interventions for both males and females may focus on myths surrounding sexual victimization, so as to clarify the role of alcohol, potential perpetrators, sexual communication between interested partners, the legal process, how and where to report, the reporting process, available counseling resources, and privacy concerns. Given the contextual nature of risk for sexual victimization and the commonality of its occurrence, interventions of this manner may serve to prevent continued maladaptive coping, victimization, as well as to prevent the cycle of revictimization that a vulnerable subset of women experience.

HSIRB

This study has been reviewed and approved by the Human Subjects Institutional Review Board at Western Michigan University with revisions required before approval.

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Appendix A

Substance Use Questionnaire

1.DURING THE PAST TWO MONTHS, on average, how many days have you used alcohol during the week?

- a.0 days
- b.1 day
- c.2 days
- d.3 days
- e.4 days
- f.5 days
- g.6 days
- h.7 days

2.DURING THE PAST TWO MONTHS, on average, how much alcohol did you consume at a given time? 1 standard drink equals 1 beer, 1 glass of wine, 1 shot of alcohol, 1 standard mixed drink.

- a.None
- b.1-2 drinks
- c.3-4 drinks
- d.5-6 drinks
- e.More than 6 drinks

3.DURING THE PAST TWO MONTHS, on average, how many days have you used illicit drugs, or drugs not prescribed by a physician or use as prescribed, and used to “get high”, during the week?

- a.0 days
- b.1 day
- c.2 days
- d.3 days
- e.4 days
- f.5 days
- g.6 days
- h.7 days

4.DURING THE PAST TWO MONTHS, on average, how would you classify your drug use?

- a.None
- b.Mild
- c.Moderate
- d.Heavy

Appendix B

HSIRB Approval Letter

WESTERN MICHIGAN UNIVERSITY



Human Subjects Institutional Review Board

Date: January 27, 2011

To: Amy Naugle, Principal Investigator
Tara Adams, Student Investigator for thesis
Zachary Zimmerman, Student Investigator
Lindsey Williams, Student Investigator

From: Christopher Cheatham, Ph.D., Vice Chair

A handwritten signature in black ink that reads "Christopher C. Cheatham".

Re: HSIRB Project Number: 10-10-19

This letter will serve as confirmation that your research project titled "Sexual Behavior and the Propensity to Engage in Risk Taking Behavior" has been **approved** under the **full** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may **only** conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: October 20, 2011

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