

IMPACT OF A RAPE REVICTIMIZATION RISK REDUCTION PROGRAM ON WOMEN'S
DRINKING BEHAVIOR

by

JENNA L. MCCAULEY

(Under the Direction of Karen S. Calhoun)

ABSTRACT

The current study examined the longitudinal impact of sexual revictimization risk reduction intervention on women's binge drinking behavior and prospectively examined mechanistic relationships between drinking behavior and alcohol-related rape experiences among a multi-site sample of college women (N=491). Hierarchical linear modeling results indicate that group participants did not significantly differ from controls on number of reported binge episodes across follow-ups, nor did they differ on their trajectory of change in frequency of binge drinking across time. Prospective analyses indicated that binge drinking increased risk for subsequent rape. Among weekly binge drinkers, this risk was specific to alcohol-involved rape. Only prior binge drinking, and not type of rape experience, predicted subsequent binge drinking. Findings have direct implications for targeted programming addressing combined risks for binge drinking and rape among college women.

INDEX WORDS: Rape, Risk reduction, Binge drinking, Revictimization, Women

IMPACT OF A RAPE REVICTIMIZATION RISK REDUCTION PROGRAM ON WOMEN'S
DRINKING BEHAVIOR

by

JENNA L. MCCAULEY

B.S., University of Georgia, 2003

M.S., University of Georgia, 2006

A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial
Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2008

© 2008

Jenna L. McCauley

All Rights Reserved

IMPACT OF A RAPE REVICTIMIZATION RISK REDUCTION PROGRAM ON WOMEN'S
DRINKING BEHAVIOR

by

JENNA L. MCCAULEY

Major Professor: Karen S. Calhoun

Committee: Joan Jackson.
Lily McNair

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
May 2008

DEDICATION

I would like to dedicate this dissertation to my grandmothers, Ida McCauley and Mattie Matte. For their lifetime of love and prayers, I will spend my lifetime being grateful.

ACKNOWLEDGEMENTS

I would like to acknowledge the guidance and mentorship of my major professor, Dr. Karen Calhoun. Without her assistance the completion of this dissertation would not have been possible. I would also like to acknowledge Chad Lakey, Ph.D., for his time and statistical consultation. I would like to acknowledge my classmates, especially my colleague and friend Courtney Beard, Ph.D., for their humor, support, encouragement, and happy hours throughout the past five years. I would like to acknowledge the tireless support and love of my parents, Ken and Annette, and say a deeply felt, “thank you.” I’d like to acknowledge the comic relief of all my friends and family, who not only made it hard to focus on finishing this dissertation, but also made it possible. Last, but not least, I would like to thank my brother, Josh, for listening to me talk through both my excitement and my struggles over the past five years and for reminding me not to forget to take time to listen to the music.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	v
LIST OF TABLES	viii
CHAPTER	
1 INTRODUCTION	1
Alcohol Use and Rape	1
Binge Drinking and Rape	2
Incapacitated/Drug and Alcohol Facilitated Rape.....	4
Revictimization	5
Risk Reduction Interventions	6
Current Study	8
2 METHOD	10
Participants	10
Measures	10
Procedure.....	11
Intervention	12
3 RESULTS	13
Demographic and Descriptive Information for Full Sample.....	13
Hypothesis One: Changes in Drinking Behavior as a Function of Group	
Membership.....	14

Demographic and Descriptive Information for Control Participants	15
Hypothesis Two: Alcohol Involved Rape Predicting Subsequent Binge Drinking.....	16
Hypothesis Three: Initial Binge Drinking Predicting Subsequent Rape	17
Exploratory Analyses	18
Hypothesis Four: Initial Binge Drinking is More Strongly Associated with AIR than with FR	18
4 DISCUSSION.....	30
Intervention Effectiveness.....	31
Prospective Relationships Between Binge Drinking and Rape.....	33
Conclusions	37
REFERENCES	39
APPENDICES	47
A EXTENDED LITERATURE REVIEW	47

LIST OF TABLES

	Page
Table 1: Descriptive Statistics: Binge Drinking	19
Table 2: Descriptive Statistics: Rape	20
Table 3: Hypothesis 1	21
Table 4: Descriptive Statistics: Binge Drinking in Control Group.....	22
Table 5: Descriptive Statistics: Rape in Control Group.....	23
Table 6: Hypothesis 2A	24
Table 7: Hypothesis 2B.....	25
Table 8: Hypothesis 3	26
Table 9: Rape Frequencies Across 12 Month Follow-up	27
Table 10: Exploratory Analyses.....	28
Table 11: Hypothesis 4	29

CHAPTER 1

INTRODUCTION

Approximately 683,000 U.S. women are raped each year (Kilpatrick, Edmunds, & Seymour, 1992). According to recent surveys, 5.2% of college women were raped within the past year, with the lifetime prevalence of rape ranging from 11.5 - 15% (Kilpatrick et al, 2007, Tjaden & Thoennes, 2000). Studies with female college victims find that approximately half are using alcohol and/or intoxicated at the time of assault (Greene & Navarro, 1998, Harrington & Leitenberg, 1994) and alcohol misuse continues to emerge as both a risk factor for, and consequence of, rape (e.g., Abbey et al., 2004). Given the intimate association between alcohol use and sexual assault, it would be seemingly beneficial for intervention programs to address both reduced risk for assault and changes in alcohol consumption patterns among college women. However, to date, no intervention outcome studies targeting rape risk reduction have examined the impact of their programming on the drinking behavior of participants. The present study is the first to do so, examining longitudinal changes in drinking patterns as a result of a rape intervention aimed at college women with a previous victimization history.

Alcohol Use and Rape

Alcohol has been found to be involved in one-half to two-thirds of sexual assault incidents and is clearly identifiable as a risk factor for assault (Abbey, 1991; Pernanen, 1991). The exact mechanism for heightened risk remains unclear. However, one important factor is that drinking by the victim prior to the assault is negatively related to her ability to resist (Abbey et al., 2002). In addition, higher levels of alcohol consumption may be correlated with a lifestyle

that involves drinking in public places, higher numbers of sexual partners, and other risk-prone activities which all contribute to the increased risk for victimization (Testa & Parks, 1996).

Conversely, rape and subsequent alcohol abuse have been strongly linked in both cross-sectional and longitudinal studies. Some evidence suggests that sexual assault may be an independent risk factor for substance abuse/dependence (Chilcoat & Breslau, 1998; Epstein et al, 1998; Stewart, 1996; Kessler, et al, 1995). Among a nationally representative sample of adolescents, those with a history of sexual assault were 4.55 times more likely to endorse substance abuse than those without an assault history. The National Women's Study provided one of the few longitudinal perspectives on the relation between sexual assault and alcohol use (Kilpatrick et al, 1997). Subsequent to an assault, women's odds of developing alcohol abuse increased significantly (odds ratio [OR] = 2.16). Previous alcohol abuse placed women at almost five times more risk than assault alone for subsequent alcohol abuse, with OR > 10, providing strong evidence for the relation between rape and alcohol abuse, but suggesting that previous alcohol use may be the strongest predictor of subsequent abuse.

Binge Drinking and Rape

While alcohol use has been recognized as both a proximal and distal risk factor for sexual victimization, more recent research focuses specifically on the role of heavy episodic drinking in rape risk. Binge drinking, or heavy episodic drinking (HED), has been defined by NIAAA (2004) as a pattern of drinking that "corresponds to consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours." The relation between binge drinking and rape is of particular interest among college women, given that a preponderance of evidence supports atypically high rates of binge drinking in this population (Harford, Wechsler, & Seibring, 2002, Knight et al., 2002, McCabe, 2002). Mohler-Kuo, et al. (2004) examined a group of school and

individual factors in relation to any form of rape versus rape while intoxicated. Results found frequent heavy episodic drinking (or binge drinking) to be the strongest predictor of intoxicated rape and other forms of rape, with an odds ratio of 7.83 and 2.82 respectively.

Less evidence exists that identifies binge drinking as a health outcome of rape. Humphrey & White (2000) found that sexual assault doubled the odds of heavy drinking in the following year among their female college participants. However, this study did not account for the influence of prior levels of alcohol consumption, which may be essential given that evidence from community samples suggests drinking levels prior to rape may have a greater influence on drinking subsequent to traumatic events than the traumatic events themselves.

Results from a longitudinal investigation of community women suggest that sexual victimization was not significantly related to subsequent alcohol consumption or alcohol problems, but rather time-two alcohol consumption and alcohol problems were predicted by time-one alcohol consumption alone (Testa & Livingston, 2000). Other longitudinal studies examining the effects of other forms of aggression (e.g., intimate partner violence, physical violence) have produced similar findings (Demaris & Kaukinen, 2005; Testa, Livingston, Leonard, 2003; Testa & Leonard, 2001). Whereas these studies provide valuable information on the relation between binge drinking and aggression, inconsistent methodology, dissimilar samples, and differing operational definitions of aggression between studies make it difficult to draw concrete conclusions regarding the relationship of sexual assault and subsequent heavy drinking.

Incapacitated/Drug and Alcohol Facilitated Rape

Recently, attention has been given to the tactical use of alcohol to perpetrate rape.

Incapacitated or drug/alcohol facilitated rape (IR/DAFR) is defined as rape by means of the

victim's self-induced intoxication (incapacitated rape; IR) or by means of the perpetrator's deliberate intoxication of the victim (drug- or alcohol-facilitated rape; DAFR). This tactic of rape has recently been distinguished from cases of *forcible or coercive rapes* (FR) in which the victim experiences force, threat of force, sustains an injury during the assault or acquiesces to the perpetrator's continual argument or use of power.

The prevalence rates of IR/DAFR are striking, intimating that alcohol-involved rapes pose a public health risk worthy of attention. A recent national survey of college women estimated the lifetime prevalence of IR/DAFR to be 6.7% (Kilpatrick et al, 2007). Of women endorsing at least one rape experience, IR/DAFR incidents accounted for nearly half of the rapes reported in the study. Mohler-Kuo, et al. (2004) found that nearly three-quarters (72%) of the rape victims in their multi-college sample of women were intoxicated at the time of their assault. Other recent prevalence estimates from the National Survey of Adolescents data indicate that IR/DAFR incidents account for 18% of all sexual assaults among adolescents who have more limited access to alcohol than the adults in the aforementioned samples (McCauley, et al., in submission). This adolescent estimate is consistent with international prevalence rates of 20% of all rapes reported for IR/DAFR (Foote, Wangmann, & Braaf, 2004). In sum, IR/DAFR rates range from 18%-72% of assaulted samples and account for a significant portion of rape experiences.

In addition to being a notable public health risk, evidence suggests that IR/DAFR may be somewhat unique in its characteristics and health consequences. Alcohol use prior to age 18 and higher rates of alcohol use concurrent with time of assault have been uniquely associated with IR in comparison to FR in previous studies (Abbey et al., 2004, Testa et al., 2003). Kaysen, et al. (2006) produced the only known study to longitudinally examine the use of alcohol and alcohol

problems as a function of IR experience. In their sample of college students, they found that IR was both concurrently and prospectively associated with an increase in alcohol consumption and the endorsement of negative consequences of alcohol use. In addition, lifetime experience of IR and DAFR (and not FR) were significantly associated with past year rates of substance abuse and binge drinking among college women (McCauley, et al., 2007). Taken together these results suggest that women with a history of IR are at particularly high risk for continued problem drinking, and thus may be at subsequently higher potential risk for revictimization.

Revictimization

Women with a history of prior rape are at between 2 and 4.5 times greater risk for future victimization than women without a rape history, making prior rape history one of the strongest risk factors for subsequent assault (Calhoun et al., 2002, Gidycz, Hanson, & Layman, 1995, Humphrey & White, 2000). While a handful of theories have been posited to explain both child-to-adult and multiple adult revictimization phenomena, no one theory has gained unequivocal empirical support (e.g., Macy, 2007; for review see Breitenbecher, 2001, Messman & Long, 1996, Rich et al., 2004). One such posited theory of revictimization is that lifestyle or situational factors, such as heavy drinking, may account for sexual revictimization.

In support of the situational factors theory, Messman-Moore & Long (2002) found that victims of childhood sexual abuse were more likely than non-victims to report alcohol and substance related disorders, and conversely, alcohol and substance related disorders were predictive of subsequent adult sexual assault. In contrast, in her review of empirical support for theories of revictimization, Breitenbecher (2001) noted that the literature reveals partial support for the role of alcohol/substance use as a mechanism of revictimization, as some studies have failed to find significant associations between alcohol/substance abuse and revictimization

(Collins, 1998, Gidycz et al., 1995). Some of these inconsistencies may be resolved by focusing on the impact that alcohol/substance use has as a mechanism specifically for alcohol-involved revictimization.

Risk Reduction Interventions

Several rape risk reduction interventions have been aimed specifically at college women. They have evidenced limited success at best, with few being effective at reducing revictimization risk and none reporting on associated post-intervention changes in drinking behavior (e.g., Breitenbecher & Gidycz, 1998, Hanson & Gidycz, 1993; for review see Gidycz, Rich, & Marioni, 2002 and Sochting, Fairbrother, & Koch, 2004). In their review of rape risk reduction programming using a cumulative meta-analysis, Hanson & Broom (2005) found that intervention programming presented to college women, overall, have a “small beneficial effect” equivalent to preventing four sexual assaults for every 100 women attending a given program. None of these outcome studies examined changes in drinking behavior as associated benefits of participation or in relation to subsequent victimization.

Brief interventions based on skills training and brief motivational interviewing (BMI) techniques have shown effectiveness in reducing drinking behavior among college problem drinkers (for reviews see Larimer & Crouce, 2007 and Larimer & Crouce, 2002). Specifically, several studies support the efficacy of these interventions in reducing heavy drinking among particularly high risk groups such as college freshman (e.g., Carey et al., 2006) and college women adjudicated for alcohol related issues (Labrie et al., 2007). Several of these interventions incorporate harm reduction strategies to reduce risk for alcohol related problems, such as sexual assault (Carey et al., 2007, Carey et al., 2006, Dimeff et al., 1999, Murphy et al., 2001). These findings support the potential success of incorporating material and processes from BMIs for

alcohol within the context of sexual assault interventions. However it is important to note that to date no outcome data for BMIs specifically addresses their impact on sexual assault risk.

Several parallels may be drawn between the literature on rape risk reduction interventions and brief interventions for drinking among college students. First, both seem to be most effective when targeting specific populations (i.e., previously victimized women, problem drinkers). Second, literature in both areas supports the ineffectiveness of purely educational programming, specifically among populations at highest risk (i.e., previously victimized women, problem drinkers). Third, gender effects have been found in both areas, with female only groups being most effective for rape risk reduction programming, and with partial support for BMIs having greater efficacy among female participants. Finally, and perhaps most importantly, the most effective interventions in both domains capitalized on motivational interviewing techniques to contextualize potential costs of engaging in risky behaviors. More specifically, interventions that included personalized risk assessments and face-to-face normative feedback have produced promising results with respect to both reduction in problematic drinking and reduced risk for revictimization.

Marx et al. (2001) conducted a pilot outcome assessment of a risk reduction intervention specifically for women with a history of sexual assault. The prevention program, a combination of psycho-education and skills training, was successful at significantly reducing rates of subsequent rape among participants (vs. control) at the two month follow-up. Most relevant, the intervention program also produced significantly lower rates of alcohol-involved rapes among group participants (9% vs. 66%). While the intervention did not focus exclusively on alcohol as a risk factor, this was addressed during basic psycho-education of risk factors and again for some women while discussing their personalized assault risk assessments.

Calhoun et al. (2002), undertook a larger scale trial of this intervention program utilizing a multi-site, multiple follow up design and also garnered results of significantly reduced risk for revictimization among group participants (vs. control) through one year follow-up. While the program did include material on heavy drinking as a risk factor for assault and utilized personalized risk assessment techniques, similar to all previous rape risk reduction program outcome studies, the program's impact on drinking behavior has not yet been examined as a potential outcome of treatment.

Current Study

Given the strong association between drinking behavior and risk for victimization, an effective intervention would ideally address both issues in tandem. To date, no outcome data has reported on women's changes in drinking subsequent to participation in rape risk reduction programming. The current study examined this relationship with data from an intervention aimed at reducing college women's risk of sexual revictimization. While Calhoun, et al. (2002) found their intervention to be effective at reducing revictimization rates among participants compared to wait-list controls, changes in drinking behavior and the impact of these changes on revictimization have yet to be examined.

The current study had the following aims:

- (1) To examine longitudinal impact of group intervention on drinking behavior. Specifically we predicted that women participating in the intervention would evidence greater decrease in drinking behavior than their wait-list control counterparts.
- (2) To prospectively examine the relationship between drinking behavior and alcohol-related rape experiences. Specifically, we predicted a reciprocal

relationship between binge drinking and revictimization for those women experiencing alcohol-involved rapes (AIR) and not for those women experiencing rapes without the victim's use of alcohol/substances. (i.e., AIR victimization would be related to subsequent binge drinking and binge drinking would be related to subsequent experience of AIR).

CHAPTER 2

METHOD

Participants

Participants were 491 college women with a history of at least one previous rape or attempted rape. They were recruited from a large Southeastern and a mid-sized Midwestern university and were compensated for their time with their choice of course credit or a small monetary sum.

Measures

Adolescent/adult sexual victimization. Sexual Experiences Survey (SES): The Sexual Experiences Survey is a self-report behavioral measure created to assess levels of sexual victimization. The items have been worded to assess a range of unwanted sexual contact (Koss & Oros, 1982) and their frequency of occurrence at and above age 14. The measure has good test-retest reliability, with 93% agreement rates between two administrations and good correlation with interviewer-based measures of sexual assault experiences ($r=.83$; Koss & Gidycz, 1985). Additionally, the measure has sufficient internal consistency and reliability for female college students ($\alpha = .74$). The female version of the SES was used in this study.

Victimization was defined as completed rape. *Drug/alcohol facilitated rape (DAFR)* was defined as women endorsing that they “had sexual intercourse when (they) didn’t want to because a man gave (them) alcohol or drugs to prevent (them) from resisiting” (SES question 17). Women screened into the more broadly defined *alcohol-involved rape (AIR)* category if they endorsed DAFR and/or if they endorsed any other form of rape assessed by the SES (items 13,

15, 17, 19, and 21) and in addition noted on follow-up questioning (SES item 25) that they were under the influence of alcohol at the time of this experience. *Forcible/coercive rape (FR)* experiences were those rape experiences in which intoxicant use on the part of the victim was not involved.

Cahalan Drinking Habits Questionnaire (DHQ): The Drinking Habits Questionnaire (DHQ) (Cahalan, 1969), is a 13-item self-report questionnaire assessing level of drinking via multiple choice questions concerning the quantity and frequency of alcohol consumption. The DHQ asks the individual to estimate the frequency of their consumption of wine, beer, and liquor over a specified period of time, as well as the quantity of drinks they typically consume during a drinking episode.

Three operational definitions of heavy episodic drinking were used for analyses: (1) *Total Binge Drinking*: a continuous measure of reported incidents of binge drinking in the past year (or since follow-up), (2) *Monthly Binge Drinker*: a dichotomous variable calculated by dividing the participants' total number of binge occasions by twelve, and (3) *Weekly Binge Drinker*: a dichotomous variable calculated by dividing participants' total number of binge occasions by fifty-two.

Procedure

These data were from a larger study that examined the efficacy of a sexual assault risk reduction program. Participants were prescreened in a large group setting to assess for previous victimization, using the SES. Those who reported an episode of unwanted attempted or completed vaginal, anal, or oral intercourse through perpetrator use of coercion, force, or threat of force in adolescence and/or adulthood, but not within the past three months, were eligible for the study. They then met individually with a trained graduate assistant who screened for

significant suicidal ideation or severe current psychopathology (e.g., thought disorder).

Participants were randomly assigned to the experimental (risk reduction program; N=263) group or a wait-list control group (N=228). Both groups returned for follow-up assessments four, eight, and twelve months later. At each follow-up, they completed the same set of questionnaires as at baseline, except that the SES was modified to assess for the occurrence of sexual victimization during the 4-month period since the previous assessment.

Intervention

Women were randomly assigned to participate in the rape revictimization risk reduction programming. Women were then scheduled for two, two-hour intervention sessions, spaced no more than one week apart. These sessions were conducted by a trained graduate level researcher/clinician who followed a manualized group protocol and were subject to random fidelity checks. Groups consisted of 4-12 participants on average. Topics covered in each session are broadly discussed below.

Session one consisted of the following elements: psychoeducation (including the role of alcohol as a risk factor), video vignettes of survivor stories, identification of situational, perpetrator, and personal risk factors, problem solving using hypothetical scenarios, and review of the recovery process for rape survivors. For homework, the women were asked to complete a personalized risk assessment that was to be discussed in the second session. Session two primarily consisted of a focused follow-up on the personalized risk assessment the women had completed for homework. These risk factor assessments were discussed in the group format. In addition, problem solving strategies were directly applied to the personal risk factors raised by participants. Finally, women participated in brief assertiveness skills training.

CHAPTER 3

RESULTS

Demographic and Descriptive Information for Full Sample

The women (N=491) were an average age of 19.10 (SD=1.18) and were predominantly Caucasian (89.6%). Approximately half of the women (49.7%) were in their first year of college, 31.1% were in their second year, and the remaining 19.2% were upperclassmen. Almost all women (99%) reported a heterosexual orientation, with 94% of the women reporting either dating casually or being involved in a long-term, monogamous dating relationship. The remaining 6% either did not date or were cohabiting/married at the time of their initial screening. Approximately one-third of the sample (32 %) reported previous engagement in therapy, while 5.7% reported current therapy at the time of initial data collection. Two-thirds (67%) of women reported being 16 years or older at the time of their first consensual sexual experience (while 33% reported their first consensual sex experience occurred prior to age 16). The majority of these previously victimized women (55.2%) reported their risk of assault in the upcoming semester as “below average,” whereas only 2.4% of women rated their risk as “above average.”

Monthly and weekly binge drinking rates for the full sample are reported for initial, 4 month, 8 month, and 12 month time points in *Table 1*. Group participants did not significantly differ from control participants on initial measures of either monthly binge drinking ($\chi^2 = 0.22$, ns) or weekly binge drinking ($\chi^2 = 0.18$, ns). Group participants also did not significantly differ from control participants on initial measures of prevalence of DAFR ($\chi^2 = 0.49$, ns), FR ($\chi^2 =$

0.64, ns), or Any Rape ($\chi^2 = 0.55$, ns). Prevalence of these forms of rape for initial, 4 month, 8 month, and 12 month time-points are presented in *Table 2*.

Hypothesis One: Changes in Binge Drinking as a Function of Group Participation

Hierarchical Linear Modeling (HLM) was the analytic choice for the current longitudinal data for several reasons. First, and most relevant to the present study, HLM is quite robust with respect to missing data given that it does not require equivalent spacing of measurement between or within participants (Byrk & Raudenbush, 1992, Hedeker, 2004). Including participants that may have one or two missing data points not only increases the statistical power of the analysis, but also avoids potential confounds that arise due to characteristic differences between those who complete all time-point measurements and those who do not. Additionally, unlike univariate mixed model analyses, HLM does not assume that the variance and covariances of the dependent variable across time are equal.

HLM analysis was conducted using HLM6 Software (Raudenbush, Byrk, Cheong, Congdon, & Toit, 2004). One participant's data was eliminated from analysis due to their lack of binge drinking data at any follow-up. A two-level, measures-within persons model was used for the current data. Measures-within persons model was selected given that our level-one model nested repeated measures data (time point) in person, while our level-two model examined the impact of the covariate of group on binge drinking frequency over time. The model is specified below:

Level-1 Model

$$Y = P_0 + P_1 * (\text{TIMEPT}) + E,$$

where P_0 = intercept, P_1 = regression coefficient, E = error variance, Y = continuous number of binge drinking occasions

Level-2 Model

$$P_0 = B_{00} + B_{01} * (\text{GROUP}) + R_0$$

$$P_1 = B_{10} + B_{11} * (\text{GROUP}),$$

where B_{01} and B_{11} = level 2 coefficients, and R_0 = level 2 error variance

In the final estimation of fixed effects, group coefficients were non-significant for both total mean binge drinking occasions, as indicated by the level two coefficient for the level one intercept ($\gamma = -4.85$, $t = -0.42$, $p = 0.68$), and for group effect on the trajectory of change in binge drinking frequency over time ($\gamma = 2.23$, $t = 0.63$, $p = 0.53$). Thus, women receiving the group intervention did not experience an accelerated negative rate of change in binge drinking frequency over time when compared to women in the control condition. Hypothesis one was not supported. See *Table 3*.

Demographic and Descriptive Information for Control Participants

Hypotheses 2-4 were examined using only the women in the control condition who provided data through 12 month follow-up ($N=228$). Separate demographic information for this sample follows. Women were an average age of 19.16 ($SD=1.19$), with the median year in school being sophomore. The ethnic identification of the sample was: Caucasian, 88.5%; African-American, 6.6%; Asian, 2.2%; Hispanic, 1.3%; and other ethnicity, 1.3%. Almost all women (99.1%) reported a heterosexual orientation, with a large majority of the women either dating casually (55.9%) or in a long-term monogamous relationship (37.9%) at the time of initial data collection. Approximately one-third of the sample (32 %) reported previous engagement in therapy, while 7% reported current therapy at the time of initial data collection. Nearly two-thirds (65%) of women reported being 16 years or older at the time of their first consensual sexual experience (while 35% reported their first consensual sex experience occurred prior to age

16), and women in our sample reported a mean number of three lifetime consensual sex partners. The majority of these previously victimized women (66.1%) reported their risk of assault in the upcoming semester as “below average,” whereas only 4.4% of women rated their risk as “above average.”

Monthly and weekly binge drinking rates among women in the control condition are reported for initial, 4 month, 8 month, and 12 month time points in *Table 4*. Although a significant portion of women did not have sufficient data at follow-up to definitively determine their frequency of monthly binge drinking (missing data: initial, 1.8% 4 month, 14%, 8 month, 24.1%, and 12 month, 26.3%), rates of monthly binge drinking among the reporting sample were high. Approximately half of all women reported binge drinking at least monthly at each time point. Missing data rates were also significant for weekly binge drinking (4% - 26.4%). However, approximately one-third of *reporting* women endorsed weekly binge drinking across initial (32%), 4 month (37%), 8 month (37.5%) and 12 month time points (34.5%).

Approximately 84% of the sample reported completed rape (versus attempted rape) at the initial time point. One-quarter of all women reported DAFR experience at their initial time point (25.4%). Rates of DAFR remained fairly consistent, between 2.2% and 3.5%, across follow-up assessments. Rates of the more broadly defined AIR were slightly higher, consistently around 6% across follow-up assessments. For a full report on rape frequencies at initial, 4 month, 8 month, and 12 month time points see *Table 5*.

Hypothesis Two: Alcohol-involved rape predicting subsequent binge drinking.

A hierarchical logistic regression was conducted to examine potential initial time point predictors of 4 month reported monthly binge drinking. We predicted that AIR would be differentially related to subsequent monthly binge drinking, but would not significantly account

for subsequent binge drinking above and beyond previous binge drinking. Initial DAFR, initial FR, and initial Any Rape were entered as step one predictor variables. None of these variables emerged as significant predictors of 4-month time point monthly binge drinking. The final model included initial monthly binge drinking as a step two predictor variable. Initial monthly binge drinking significantly predicted subsequent 4 month report of monthly binge drinking ($\beta = 4.13$, $p < .001$), with women reporting initial monthly binge drinking being approximately 62 times more likely to report monthly binge drinking at follow-up. Hypothesis two was not supported for monthly binge drinking. See *Table 6*.

A hierarchical logistic regression was conducted to examine potential initial time point predictors of 4 month reported weekly binge drinking. Initial DAFR, initial FR, and initial Any Rape were entered as step-one predictors. None of these variables emerged as significant predictors of 4-month weekly binge drinking. The final model included initial weekly binge drinking as a step-two predictor variable. No rape variables were significant in the final model. However, initial weekly binge drinking significantly predicted subsequent 4 month report of weekly binge drinking ($\beta = 2.92$, $p < .001$), with women reporting initial weekly binge drinking being approximately 19 times more likely to report weekly binge drinking at follow-up. Hypothesis two was not supported for weekly binge drinking. See *Table 7*.

Hypothesis Three: Initial Binge Drinking Predicting Subsequent Rape

Two logistic regression analyses were used to examine the contribution of initial report of monthly and weekly binge drinking on subsequent risk for Any Rape experience. We predicted that binge drinking would be significantly associated with subsequent rape experience. Initial monthly binge drinking significantly predicted Any Rape at 4 month time-point ($\beta = 1.51$, $p = 0.01$), with women binge drinking at least monthly being 4.5 times more likely to have been

raped at four month follow-up. Weekly binge drinking was not a significant predictor of rape experiences at 4 month time-point ($\beta = 0.11$, ns). Hypothesis three was supported for monthly binge drinking, but was not supported for weekly binge drinking. See *Table 8*.

Exploratory Analyses

Given the low frequency of the various rape outcomes at 4 month time-point, rape outcomes were collapsed across 4, 8, and 12 month time-points to produce one year follow-up rates of Any Rape, AIR, and FR. *Table 9* reports the one-year frequency rates for these various types of rape. Initial monthly binge drinking and initial weekly binge drinking were examined as predictors of these three rape outcomes using chi-square analyses. Initial monthly binge drinking significantly predicted Any Rape experience at follow up ($\chi^2 = 7.71$, $p < 0.01$), AIR at any follow-up ($\chi^2 = 16.97$, $p < 0.001$), and FR at any follow-up ($\chi^2 = 4.57$, $p < 0.05$). Weekly binge drinking was only a significant predictor of AIR at any follow-up ($\chi^2 = 4.58$, $p < 0.05$). Results are reported in *Table 10*.

Hypothesis Four: Initial Binge Drinking is More Strongly Associated with AIR than with FR

Chi-square analyses examined whether women reporting initial monthly binge drinking (and initial weekly binge drinking) were significantly more likely to report AIR than FR at 4 month follow-up. Monthly initial binge drinkers were significantly more likely ($\chi^2 = 4.97$, $p < 0.05$) to experience AIR than FR, with 60% of rapes reported by these women classified as AIR. Weekly initial binge drinkers were not significantly more likely to experience AIR than FR at 4 month follow-up. Hypothesis four was supported for monthly binge drinking, but was not supported for weekly binge drinking. See *Table 11*.

Table 1: Descriptive Statistics. Frequencies for binge drinking among full sample of women (N=490)

	Initial		4 Months		8 Months		12 Months	
	YES	NO	YES	NO	YES	NO	YES	NO
Monthly Binge	60.5%	35.6%	52.3%	32.8%	47%	28.3%	46.4%	26.7%
Weekly Binge	32%	63.7%	30.5%	54.2%	29.7%	45.6%	26.1%	47%

* Percentages do not add to 100% due to missing data.

Table 2: Descriptive Statistics: Frequencies for drug-alcohol facilitated rape (DAFR), alcohol-involved rape (AIR), forcible/coercive rape (Other), and any rape for full sample (N=491).

	Initial		4 Months		8 Months		12 Months	
	YES	NO	YES	NO	YES	NO	YES	NO
Any Rape	82.7%	17.1%	16.3%	83.7%	13.6%	86.4%	10.8%	89.2%
DAFR	26.9%	72.9%	3.1%	96.9%	2.6%	97.4%	3.1%	96.9%
AIR	****	****	7.7%	92.3%	6.9%	93.1%	5.3%	94.7%
FR	73.7%	25.7%	14.3%	83.7%	11.6%	86.4%	9.0%	89.2%

**** Follow-up questions discerning alcohol-involved rape were unavailable for initial time point.

Table 3. Hypothesis 1. Final estimation of fixed effects (with robust standard errors) for HLM analysis investigating intervention groups impact on frequency of binge drinking occasions over one year of follow-up assessments.

FIXED EFFECT		COEFFICIENT	SE	T-RATIO	APPX. D.F.	P-VALUE
For	INTRCPT1, P_0					
	Group, B_{01}	- 4.85	11.58	- 0.42	492	0.68
For	TIMEPT slope, P_1					
	Group, B_{11}	2.23	3.52	0.63	1869	0.53

Table 4: Descriptive Statistics: Binge drinking among women in control condition (N=228)

	Initial		4 Months		8 Months		12 Months	
	YES	NO	YES	NO	YES	NO	YES	NO
Monthly Binge	59.6%	36.8%	50.9%	35.1%	46.5%	29.4%	46.5%	27.2%
Weekly Binge	31.1%	64.9%	32%	53.5%	28.5%	47.4%	25.4%	48.2%

* Percentages do not add to 100% due to missing data.

Table 5: Descriptive Statistics: Frequencies for drug-alcohol facilitated rape (DAFR), alcohol-involved rape (AIR), forcible/coercive rape (Other), and any rape (N=228).

	Initial		4 Months		8 Months		12 Months	
	YES	NO	YES	NO	YES	NO	YES	NO
Any Rape	84.2%	15.8%	12.7%	87.3%	11.4%	88.6%	10.1%	89.9%
DAFR	25.4%	74.6%	2.2%	97.8%	3.5%	96.5%	3.5%	96.5%
AIR	****	****	6.6%	93.4%	6.1%	93.9%	6.1%	93.9%
FR	75.9%	24.1%	11.0%	89.0%	8.3%	91.7%	8.3%	91.7%

**** Follow-up questions discerning alcohol-involved rape were unavailable for initial time point.

Table 6. Hypothesis 2a: Logistic regression analysis predicting monthly binge drinking at 4 month follow-up.

STEP	PREDICTOR VARIABLE	FINAL β	FINAL SE	FINAL WALD	STEP OR	FINAL OR	95% CI
1	Initial DAFR	-0.31	0.28	0.28	1.30	0.73	0.24 – 2.29
	Initial FR	-1.14	0.95	1.44	0.64	0.32	0.05 – 2.07
	Initial Any Rape	0.27	1.12	0.06	1.58	1.32	0.15–11.73
2	Initial Monthly Binge	4.13	0.51	65.41		62.13*	22.84-169

* significant at $p < .001$

Table 7. Hypothesis 2b: Logistic regression analysis predicting weekly binge drinking at 4 month follow-up.

STEP	PREDICTOR VARIABLE	FINAL β	FINAL SE	FINAL WALD	STEP OR	FINAL OR	95% CI
1	Initial DAFR	0.08	0.53	0.02	1.29	1.08	0.38 – 3.03
	Initial FR	-0.90	0.78	1.34	0.34	0.41	0.09 – 1.87
	Initial Any Rape	0.92	0.95	0.95	4.13	2.51	0.39–15.99
2	Initial Weekly Binge	2.92	0.40	54.22		18.60**	8.54- 40.48

** significant at $p < .001$

Table 8. Hypothesis 3: Logistic regression analysis predicting any rape experience at 4 month follow-up.

PREDICTOR VARIABLE	FINAL β	FINAL SE	FINAL WALD	FINAL OR	95% CI	P VALUE
<i>Hypothesis 3a</i>						
Initial Monthly Binge	1.51	0.56	7.27	4.51	1.51 – 13.45	0.01
<i>Hypothesis 3b</i>						
Initial Weekly Binge	0.11	0.42	0.07	1.11	0.49 – 2.54	0.80

Table 9. Rape Frequencies Across 12 Month Follow-up. Frequencies of any rape, alcohol-involved rape, and forcible/coercive rape over 12 months of follow-up.

OUTCOME VARIABLE	% YES / N	% NO / N
Any Rape at Follow-Up	25 / 57	75 / 171
AIR at Follow-Up	14.5 / 33	85.5 / 195
FR at Follow-Up	21.5 / 49	78.5 / 179

* Some women reported rape experiences at multiple time points. This is reflected in the above prevalence rates.

Table 10. Exploratory Analyses. Exploratory chi-square analyses examining initial monthly binge drinking as a predictor for various types of rape at any follow-up (4 month, 8 month, or 12 month follow up).

PREDICTOR VARIABLE	% ENDORSING OUTCOME	χ^2 VALUE	P VALUE
<i>Outcome: Any completed rape at follow-up</i>			
Initial Monthly Binge Drinking		7.71	0.006
YES	32.40		
NO	15.50		
Initial Weekly Binge Drinking		0.25	0.620
YES	28.20		
NO	25.00		
<i>Outcome: AIR at follow-up</i>			
Initial Monthly Binge Drinking		16.97	0.001
YES	22.80		
NO	2.40		
Initial Weekly Binge Drinking		4.58	0.03
YES	22.50		
NO	11.50		
<i>Outcome: FR at follow-up</i>			
Initial Monthly Binge Drinking		4.57	0.03
YES	28.10		
NO	15.50		
Initial Weekly Binge Drinking		0.02	0.88
YES	23.90		
NO	22.90		

Table 11. Hypothesis 4. Chi-square analysis using initial reports of binge drinking to predict alcohol-involved rape experience (AIR) at 4 month follow-up.

PREDICTOR VARIABLE	% ENDORSING AIR	χ^2 VALUE	P VALUE
Initial Monthly Binge Drinking		4.97	0.03
YES	60		
NO	0		
Initial Weekly Binge Drinking		0.02	0.89
YES	50		
NO	52.6		

CHAPTER 4

DISCUSSION

The current study contributes a prospective examination of the efficacy of a sexual revictimization risk reduction program in reducing binge drinking incidents among college women. Additionally, this study adds to the growing literature on alcohol involved rape, by providing a longitudinal examination of the relationships between binge drinking and subsequent rape, and vice versa. Given this elevated comorbidity of risk among college women, effective risk reduction programming addressing both risks is of high public health importance.

Approximately 60% of women in the full sample completing drinking measures across time reported at least monthly binge drinking, while over one third of these women consistently reported at least weekly binge drinking. These rates are notably higher than those reported by Wechsler et al. (2002), who found that 41% of their college women reported monthly binge drinking and approximately 20% reported weekly binge drinking. Rates of binge drinking in the current study may be at least a partial function of the sample. Given that only previously victimized women were included in the study, elevated rates of binge drinking may be in part due to the relationship between lifetime sexual assault and subsequent alcohol use problems (Humphrey & White, 2000; Kilpatrick et al., 2000). While no study to date has specifically examined binge drinking rates among college women with a history of attempted or completed rape and the current prevalence rates are in need of replication, their implications are consistent with previous research suggesting that binge drinking has stronger associations with sexual-risk taking among adolescents than do current or lifetime alcohol use measures (Dunn, Bartee, &

Perko, 2003). Elevated rates of binge drinking among this population of women heighten the need for empirically supported risk reduction programming addressing both binge drinking and sexual assault.

Intervention Effectiveness

The current study found that a group intervention aimed at reducing previously sexually victimized college women's risk for subsequent attempted or completed rape did not have significant effects on women's binge drinking behavior. That is, women who participated in the group intervention did not report significantly different frequencies of binge drinking occasions over time than did the non-treatment control women. Additionally, women participating in the group did not differ in their trajectory of change in binge drinking frequency over time. Despite several components addressing alcohol use as a risk factor for subsequent assault and the program's overall effectiveness at reducing rates of subsequent victimization (Calhoun et al., 2002), the intervention did not function to reduce participant's subsequent binge drinking over the one year follow-up.

While women participating in the current intervention may have received personalized feedback on their drinking behavior, it was only with regard to their individual risk factor assessment for sexual revictimization. Previous research indicates that more advanced stage of change (which is indicative of greater awareness of problematic components of behavior) moderates drinking intervention effectiveness among college students (Carey, Henson, Carey, & Maisto, 2007; Fromme & Corbin, 2004), and the current intervention may not have even addressed problematic drinking patterns unless the women self-identified this as a risk factor. Further, risk assessments were completed by the women for homework, and feedback was contingent upon women's self-identified risk factors rather than using women's initial pre-group

measures of alcohol use. Thus, if a woman did not view her current levels of drinking as “risky,” alcohol use may not have been highlighted as a specific risk factor (despite whether her actual frequency of binge drinking was placing her at increased risk). The design of the current intervention, which relied on women to have some degree of insight that their drinking may be problematic and risky, was likely not effective at reaching all problematic drinkers in the sample.

Previous research on factors contributing to binge drinking in college students highlights the strong influence of peer and environmental factors in both the initiation and maintenance of problematic drinking (Strano et al, 2004). These factors, such as positive alcohol expectancies, perception of minimal risk, perception that friends don’t disapprove of binge drinking, and perception of high normative drinking, may have served to override the relatively brief focus of alcohol use as a risk factor for subsequent assault provided by the current intervention.

Additionally, several techniques that have been shown to increase effectiveness of brief drinking interventions among college students by addressing the aforementioned factors, such as motivational interviewing, provision of normative feedback on alcohol expectancies, and decisional balance exercises (Juarez, 2005; for review see Carey et al., 2007), were not incorporated into the current intervention design.

A large portion of the current sample reported a high frequency (weekly) of binge drinking at their initial time-point, perhaps indicating that a sizeable minority of women receiving sexual assault risk reduction programming may have also been appropriate for receiving brief motivational interventions for problematic drinking. Future research should investigate the effectiveness of interventions targeting problematic drinking in reducing rates of sexual victimization and revictimization.

Prospective Relationships Between Binge Drinking and Rape

Analyses conducted with control participants allowed for the prospective examination of the relative contributions of binge drinking to subsequent revictimization, and rape experiences to subsequent binge drinking. Monthly binge drinking was predictive of subsequent victimization, with initial monthly binge drinking predicting any rape experience over the one year follow-up period and women reporting at least monthly binge drinking being 4.5 times more likely to be raped at 4 month follow-up. This finding is consistent with previous longitudinal research finding that alcohol use moderated the relationship between previous victimization history and risk for subsequent victimization (Gidycz et al., 2007). Gidycz et al. found that women with a history of attempted or completed rape and moderate (monthly to bi-monthly binge drinking) alcohol use were seven times more likely than their non-victim/light drinking counterparts to experience an assault at two month follow-up. While binge drinking was not as strong a predictor of rape at the four month follow-up in the present study, it is important to note that design elements of the Gidycz et al. study make direct comparisons difficult (e.g., defining follow-up “assault” more broadly than the present study to include unwanted fondling and sexual touching, including victims and non-victims, having a larger sample size and therefore more power to detect effects). Taken together though, these findings provide strong longitudinal support for the role of binge drinking in facilitating increased risk for subsequent sexual assault.

While initial monthly binge drinking increased risk for all forms of rape, it especially increased risk for AIR. Women endorsing initial monthly binge drinking were significantly more likely to experience AIR than FR at 4 month time-point, with 60% of monthly binge drinkers reporting AIR (vs. 40% reporting FR). This finding is consistent with previous longitudinal research identifying heavy alcohol use as a strong and consistent predictor of incapacitated rape experiences among college women (Kaysen et al, 2006; Mohler-Kuo et al., 2004).

Given the small base rates of completed rape at 4 month follow-up, exploratory analyses examined both monthly and weekly binge drinking with respect to differentiating between victims of Any Rape, AIR, and FR across all follow-ups during the one-year assessment period. Women who reported binge drinking at least monthly were at significantly greater risk for Any Rape, AIR, and FR at one year follow-up. However, the more stringent weekly binge drinking criteria only differentiated between victims and non-victims of AIR. The current longitudinal results extend previous cross-sectional research finding that previous levels of frequent heavy alcohol use differentiate between victims of incapacitated and forcible rape (Abbey et al., 2004; Testa & Livingston, 2003).

Taken together, evidence suggests that frequent binge drinking may be a risk factor specific to AIR and may not differentiate between victims and non-victims of FR. Although the prospective nature of these data lend strong support to this unique relationship between binge drinking and AIR, the present study was conducted with a particularly high-risk sample of previous sexual assault victims and may not generalize to women without such history. However, Krebs et al. (2006) reported similar findings in their prospective web-based survey of college students, finding that substance use, while consistently associated with alcohol or drug-enabled assaults during college, were not predictive of forced sexual assault experiences. These findings support continued efforts to integrate risk reduction programming addressing both the risks associated with binge drinking and risk for AIR, specifically among women with a history of sexual victimization. Findings from this study also suggest that limited resources aimed at AIR risk reduction would best be targeted at women reporting frequent binge drinking episodes.

The present study did not support the hypothesis that previous rape experience (specifically AIR) would predict subsequent binge drinking. All of the rape variables of interest

(DAFR, FR, and Any Rape) failed to significantly predict binge drinking above and beyond the predictive power of previous drinking. Women with a history of binge drinking at initial assessment were 62 times (19 times more likely for weekly binge drinking) more likely to report monthly binge drinking at 4 month follow-up. The current study is somewhat inconsistent with previous cross-sectional research in college women suggesting that incapacitated rape experiences are uniquely associated with past year binge drinking (McCauley et al., in preparation). However, unlike McCauley et al., the current study uses prospective data from a sample of only women with a victimization history and more loosely defines AIR to include any incident in which the woman believed she was intoxicated (rather than incapacitated). Additionally, the present findings are consistent with other longitudinal research suggesting that previous levels of drinking and alcohol problems, not previous rape experiences, are perhaps the best predictors of subsequent drinking behavior (Gidycz et al., 2007; Testa & Livingston, 2000). Although these findings serve to give a glimpse at factors involved in the maintenance of binge drinking behavior among college women, it is important to note that since all of the women in the present study were victims of attempted/completed rape and a large minority reported regular binge drinking at initial assessment, these results cannot speak to the role of their assault experience with respect to the initiation of drinking behavior. Also worth note, many factors (e.g., college size and location, Greek membership, age, high school drinking, illicit drug use, etc.) that have been shown in previous research to be related to maintenance of binge drinking among college students were not examined in the present study (Mohler-Kuo, 2004; for review see Vicary & Karshin, 2002). Future research should seek to prospectively examine factors involved in both initiation and maintenance of binge drinking behavior among college women,

paying careful attention to the role of various forms of rape history (e.g., AIR, incapacitated rape, FR, DAFR), as rape history variables may have differential impact.

Initial weekly binge drinking was not a significant predictor of any of the 4 month time-point rape outcome variables. While it is surprising given previous evidence that more severe substance use increases risk for subsequent sexual assault (e.g., Gidycz et al., 2007), the most plausible explanation for this lack of findings with respect to weekly binge drinking is due to insufficient power. Given the combination of two phenomena with relatively low base-rates among college women, total case inclusion in logistic regressions and cell sizes produced by the chi-square analyses were often quite small and may have contributed to null findings.

Of additional interest, it appears that our high-risk sample did not necessarily self-identify as such. Consistent with previous research (Gidycz et al., 2007; for review see Nurius, 2000), a majority (66%) of women in our sample rated their risk for subsequent sexual assault as “below average.” However, also consistent with previous research documenting increased risk for victimization among previously victimized women (Gidycz et al., 1993; for review see Breitenbecher, 2001), fully 25% of these women were revictimized over the one year follow-up. This estimate is alarmingly high when compared to estimates from previous research that place victimization rates at 2 and 3 month longitudinal follow-ups that hover between 3-4% in previous studies, further highlighting the exponential risk of this group of previously victimized college women (Gidycz et al., 1993; Gidycz et al., 1995). With respect to AIR, 14.5% of women in the control condition reported an experience during the one year follow-up period. Again, this rate highlights the elevated risk for revictimization when compared to a rate of 8.4% of women (non-victims and previous victims) who reported alcohol or drug enabled rape in a recent national college survey (Krebs et al., 2006). These elevated rates of revictimization among

women in the control condition, while not surprising, do highlight the continued need for efficacious and cost-effective risk reduction programming geared toward this population of women.

Conclusions

While the present study addresses two pressing public health concerns faced by college women with a prospective design, several limitations are important to note. First, the sample of women was predominantly Caucasian, thus limiting generalizability to women of other ethnicities. Second, while outcome measures for binge drinking behavior as a function of group participation are reported across time, no dismantling data is available to more definitively identify active components of the programming. Third, while the exclusive focus of this study on a high-risk population of previously victimized women is warranted, findings again may not generalize to women without a history of attempted or completed rape. Also, this study speaks only to the maintenance of the relationship between binge drinking and rape and cannot speak to factors involved in the initiation the relationship. Finally, given the low probability events examined in some analyses (e.g., weekly binge drinking and AIR), future studies could benefit from larger sample sizes.

The current study has several implications for future research. First, this study adds to the growing literature on binge drinking's large contribution to risk for both continued binge drinking and subsequent rape, particularly for AIR. Given the significant contribution of risk made by binge drinking, future research should examine whether effective problem drinking interventions reduce women's risk for subsequent rape, specifically AIR. While the current study found no evidence for the effectiveness of a sexual revictimization risk reduction intervention in reducing binge drinking behavior, effective interventions are needed that concurrently address

problematic drinking and rape. As such, current sexual assault prevention programming may benefit from more objective screening for women's individual risk factors for assault (such as current levels of binge drinking) and incorporation of more active components (such as normative feedback on expectancies, decisional balance, etc.) of effective BMI's for problem drinking where necessary. In sum, a "one-size fits all" model for rape risk reduction programming may be a myth. As research continues to differentiate risk factor profiles for various forms of rape, more efforts are needed to translate and incorporate these insights into empirically validated intervention programming.

REFERENCES

- Abbey, A. (1991). Acquaintance rape and alcohol consumption on college campuses: How are they linked? *Journal of American College Health*, 39(4), 165-169.
- Abbey, A., Clinton, A.M., McAuslan, P., Zawacki, T., & Buck, P.O. (2002). Alcohol involved rapes: Are they more violent? *Psychology of Women Quarterly*, 26, 99-109.
- Abbey, A., Zawacki, T., Buck, P.O., Clinton, A.M., McAuslan, P. (2004). Sexual assault and alcohol consumption: what do we know about their relationship and what types of research are still needed? *Aggression and Violent Behavior*, 9, 271-303.
- Brietenbecher, K. H. (2001). Sexual revictimization among women: A review of the literature focusing on empirical investigations. *Aggression and Violent Behavior*, 6, 415-432.
- Breitenbecher, K. H. & Gidycz, C.A. (1998). An empirical evaluation of a program designed to reduce the risk of multiple sexual victimization. *Journal of Interpersonal Violence*, 13, 472-488.
- Byrk, A.S. & Raudenbush, S.W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Newbury Park, CA: Sage.
- Cahalan, D. (1969). A multivariate analysis of the correlates of drinking-related problems in a community study. *Social Problems*, 17(2), 234-247.
- Calhoun, K.S. & Gidycz, C.A. (2002). *Self-efficacy as a predictor of revictimization*.
Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.
- Carey, K. B., Carey, M. P., Maisto, S. A., & Henson, J. M. (2006). Brief motivational

- interventions for heavy college drinkers: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 74, 943–954.
- Carey, K. B., Henson, J. M., Carey, M. P., & Maisto, S. A. (2007). Which heavy drinking college students benefit from a brief motivational intervention? *Journal of Consulting and Clinical Psychology*, 75(4), 663-669.
- Carey, K.B., Scott-Sheldon, L.A.J., Carey, M.P., & DeMartini, D.S. (2007). Individual level interventions to reduce college student drinking: A meta-analytic review. *Addictive Behaviors*, 32, 2469-2494.
- Chilcoat, H.D. & Breslau, N. (1998). Investigations of causal pathways between PTSD and drug use disorders. *Addictive Behaviors*, 23(6), 827-840.
- Collins, M. E. (1998). Factors influencing sexual victimization and revictimization in a sample of adolescent mothers. *Journal of Interpersonal Violence*, 13, 3-24.
- Demaris, A. & Kaukinen, C. (2005). Violent victimization and women's mental and physical health: Evidence from a national sample. *Journal of Research in Crime and Delinquency*, 42(4), 384-411.
- Dunn, M. S., Bartee, R. T., Parko, M. A. (2003). Self reported alcohol use and sexual behaviors of adolescents. *Psychological Reports*, 92(1), 339-348.
- Epstein, J., Saunders, B.E., Kilpatrick, D.G., & Resnick, H.S. (1998). PTSD as a mediator between childhood rape and alcohol use in adult women. *Child Abuse and Neglect* 21(3), 223-234.
- Foote, W., Wangmann, J., & Braaf, R. (2004). Old crime, new modus operandi: Preventing drug and alcohol assisted sexual assault. *A Report to the NSW Strategy to Reduce Violence Against Women for the Central Sydney Regional Reference Group*, Attorney General's

Department, New South Wales.

- Fromme, K., & Corbin, W. (2004). Prevention of heavy drinking and associated negative consequences among mandated and voluntary college students. *Journal of Consulting and Clinical Psychology*, 72, 1038–1049.
- Gidycz, C. A., Coble, C. N., Latham, L., & Layman, M. J. (1993). Sexual assault experience in adulthood and prior victimization experiences. *Psychology of Women Quarterly*, 17, 151–168.
- Gidycz, C.A., Hanson, K., & Layman, M. (1995). A prospective analysis of the relationships among sexual assault experiences: An extension of previous findings. *Psychology of Women Quarterly*, 19, 5-29.
- Gidycz, C. A., Loh, C., Lobo, T., Rich, C. L., Lynn, S. J., & Pashdag, J. (2007). Reciprocal relationships among alcohol use, risk perception, and sexual victimization: A prospective analysis. *Journal of American College Health*, 56(1), 5-14.
- Gidycz, C. A., Rich, C. L., & Marioni, N. L. (2002). Interventions to prevent rape and sexual assault. In J. Petrak & B. Hedge (Eds.), *The trauma of adult sexual assault: Treatment, prevention, and policy* (pp. 235–260). New York: Wiley.
- Greene, D.M. & Navarro, R.L. (1998). Situation-specific assertiveness in the epidemiology of sexual victimization among university women. *Psychology of Women Quarterly*, 22, 589-604.
- Hanson, R.K. & Broom, I. (2005). The utility of cumulative meta-analysis: Application to programs for reducing sexual violence. *Sexual Abuse: A Journal of Research and Treatment*, 17(4), 357-373.
- Hanson, K.A. & Gidycz, C.A. (1993). Evaluation of a sexual assault prevention program.

- Journal of Consulting and Clinical Psychology*, 61(6), 1046-1052.
- Harford, T. C., Wechsler, H., & Seibring, M. (2002). Attendance and alcohol use at parties and bars in college: A national survey of current drinkers. *Journal of Studies on Alcohol*, 63(6), 726-733.
- Harrington, N.T. & Leitenberg, H. (1994). Relationship between alcohol consumption and victim behaviors immediately preceding sexual aggression by an acquaintance. *Violence & Victims*, 9(4), 315-324.
- Hedeker, D. (2004). An introduction to growth modeling. In David Kaplan (Ed.), *The Sage handbook of quantitative methodology for the social sciences*. (pp.21-234). Thousand Oaks, CA: Sage.
- Humphrey, J.A. & White, J.W. (2000). Women's vulnerability to sexual assault from adolescence to young adulthood. *Journal of Adolescent Health*, 27, 419-424.
- Juarez, P., Walters, S. T., Daugherty, M., & Radi, C. (2006). A randomized trial of motivational interviewing and feedback with heavy drinking college students. *Journal of Drug Education*, 36, 233-246.
- Kaysen, D., Neighbors, C., Martell, J., Fossos, N., Larimer, M.E. (2006). Incapacitated rape and alcohol use: A prospective analysis. *Addictive Behaviors*, 31, 1820-1832.
- Kessler, R.C., Sonuga, A., Bromet, E., Hughes, M. & Nelson, C.B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 52, 1048-1060.
- Kilpatrick, D.G., Acierno, R., Resnick, H.S., Saunders, B.E., & Best, C.L. (1997). A two year longitudinal analysis of the relationships between violent assault and substance use in women. *Journal of Consulting and Clinical Psychology*, 65(5), 834-847.

- Kilpatrick, D.G., Acierno, R., Saunders, B.E., Resnick, H.S., Best, C.L., & Schnurr, P.P. (2000). Risk factors for adolescent substance abuse and dependence: Data from a national sample. *Journal of Consulting and Clinical Psychology, 68*(1), 19-30.
- Kilpatrick, D.G., Edmunds, C.N., & Seymour, A.K. (1992). *Rape in America: A Report to the Nation*. Arlington, VA: National Victim Center.
- Kilpatrick, D. G., Resnick, H. S., Ruggiero, K. J., Conoscenti, L. M., & McCauley, J. (2007). Drug-facilitated, incapacitated, and forcible rape: A national study. Final report submitted to the National Institute of Justice.
- Knight, J.R., Wechsler, H., & Kuo, M. (2002). Alcohol abuse and dependence among U.S. college students. *Journal of Studies on Alcohol, 63*(3), 263-270.
- Koss, M.P. & Gidycz, C.A. (1985). Sexual experiences survey: Reliability and validity. *Journal of Consulting and Clinical Psychology, 53*, 422-423.
- Koss, M.P. & Oros, C. (1982). Sexual experiences survey: A research instrument investigating sexual aggression and victimization. *Journal of Consulting and Clinical Psychology, 50*, 455-457.
- Krebs, C. P., Lindquist, C. H., Warner, T. D., Fisher, B. S., & Martin, S. L. (2006). The campus sexual assault (CSA) study: Final report submitted to the National Institute of Justice.
- Labrie, J.W., Thompson, A.D., Hutching, K., Lac, A., Buckley, K. (2007). A group Motivational Interviewing intervention reduces drinking and alcohol related negative consequences in adjudicated college women. *Addictive Behaviors, 32*, 2549-2562.
- Larimer, M.E. & Crouce, J.M. (2007). Identification, prevention, and treatment revisited: Individual-focused college drinking prevention strategies 1999-2006. *Addictive Behaviors, 32*, 2439-2468.

- Larimer, M. E., & Crouce, J. M. (2002). Identification, prevention and treatment: A review of individual-focused strategies to reduce problematic alcohol consumption by college students. *Journal of Studies on Alcohol Supplement*, 14, 148–163.
- Macy, R. J. (2007). A coping theory framework toward preventing sexual revictimization. *Aggression and Violent Behavior*, 12, 177-192.
- Marx, B.P, Calhoun, K.S., Wilson, A.E., & Meyerson, L.A. (2001). Sexual revictimization prevention: An outcome evaluation. *Journal of Consulting and Clinical Psychology*, 69(1), 25-32.
- McCabe, S. E. (2002). Gender differences in collegiate risk factors for heavy episodic drinking. *Journal of Studies on Alcohol*, 63(1), 49-56.
- McCauley, J., Ruggiero, K.J., Conoscenti, L.M., Resnick, H.S. & Kilpatrick, D.G. (2007). *Forcible, Drug-Facilitated, and Incapacitated Rape in Relation to Binge Drinking and Substance Abuse: Results from a National Epidemiological Study*. Poster submitted to the 41st Annual ABCT Convention, Philadelphia, PA.
- McCauley, J., Ruggiero, K. J., Resnick, H. S., Kilpatrick, D. G., Conoscenti, L. M. (in preparation). Substance abuse among college women as a function of rape experiences: Results from a national study of college women.
- McCauley, J., Ruggiero, K.J., Resnick, H.S., Conoscenti, L.M. (in submission). Incapacitated rape among adolescent girls: Prevalence, case characteristics, and substance use outcomes.
- Messman, T.L. & Long, P.J. (1996). Child sexual abuse and its relationship to revictimization in adult women: A review. *Clinical Psychology Review*, 16(5), 397-420.
- Messman-Moore, T.L. & Long, P.J. (2002). Alcohol and substance use disorders as predictors of

- child to adult sexual revictimization in a sample of community women. *Violence & Victims*, 17(3), 319-340.
- Mohler-Kuo, M., Dowdall, G.W., Koss, M.P., & Wechsler, H. (2004). Correlates of rape while intoxicated in a national sample of college women. *Journal of Studies on Alcohol*, 65, 37-45.
- Pernanen, K. (1991). *Alcohol in Human Violence*. New York: Guilford Press.
- Raudenbush, S., Byrk, A., Cheong, Y. F., Congdon, R., & Toit, M. D. (2004). *HLM 6: Hierarchical Linear and Non-linear Modeling*. Lincolnwood, IL: SSI Scientific Software International.
- Rich, C. L., Combs-Lane, A. M., Resnick, H. S., & Kilpatrick, D. G. (2004). Child sexual abuse and adult sexual revictimization. In L.J. Koenig, L.S. Doll, A. O'Learey, and W. Pequegnat (Eds.), *From child sexual abuse to adult sexual risk: Trauma, revictimization, and intervention*. (pp.49-68). Washington DC: APA.
- Sochting, I., Fairbrother, N., & Kocj, W.J, (2004). Sexual assault of women: Prevention efforts and risk factors. *Violence Against Women*, 10(1), 73-93.
- Stewart, S.H. (1996). Alcohol abuse in individuals exposed to trauma: A critical review. *Psychological Bulletin*, 120(1), 83-112.
- Strano, D.A., Cuomo, M.J., & Venable, R.H. (2004). Predictors of undergraduate student binge drinking. *Journal of College Counseling*, 7, 50-63.
- Testa, M. & Leonard, K. (2001). The impact of marital aggression on women's psychological and marital functioning in a newlywed sample. *Journal of Family Violence*, 16(2), 115-130.
- Testa, M. & Livingston, J.A. (2000). Alcohol and sexual aggression: reciprocal relationships

- over time in a sample of high risk women. *Journal of Interpersonal Violence*, 15(4), 413-427.
- Testa, M., Livingston, J.A., & Leonard, K. (2003). Women's substance use and experiences of intimate partner violence: A longitudinal investigation among a community sample. *Addictive Behaviors*, 28, 1649-1664.
- Testa, M., Livingston, J.A., Vanzile-Tamsen, C., & Frone, M.R. (2003). The role of women's substance use in vulnerability to forcible and incapacitated rape. *Journal of Studies on Alcohol*, 64(6), 756-764.
- Testa, M. & Parks, K.A. (1996). The role of women's alcohol consumption in sexual victimization. *Aggression & Violent Behavior*, 1(3), 217-234.
- Tjaden, P. & Thoennes, N. (2000). Prevalence and consequences of male-to-female and female-to-male intimate partner violence as measured by the National Violence Against Women Survey. *Violence Against Women*, 6(2), 142-161.
- Vicary, J. R. & Karshin, C. M. (2002). College alcohol abuse: A review of the problems, issues, and prevention approaches. *The Journal of Primary Prevention*, 22(3), 299-331.
- Wechsler, H., Lee, J.E., Kuo, M., Seibring, M., Nelson, T.F. & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from four Harvard School of Public Health College Alcohol Study surveys: 1993-2001. *Journal of American College Health*, 50(5), 203-217.

APPENDIX A

EXTENDED LITERATURE REVIEW

Section I: Binge Drinking Among College Women

“Are college students alcoholics?” This was the question posed by Brower (2002) as he reviewed findings garnered from a multi-year granted study examining patterns of alcohol use among college students. His answer to this question was, “no,” and he framed this answer on several tenets of college drinking. First, researchers in the area of college drinking have defined problem drinking among students as drinking behaviors that result in some form of negative consequence for the individual or community. Next, he noted that episodic heavy drinking was a problem of the college environment and the problems most commonly associated with college drinking are divergent from those associated with alcohol abuse and dependence in the general population. Thirdly, he found that binge drinking patterns, while cyclical in nature, are typical behavior for heavy drinking campuses. Finally, most college binge drinking (at least on a consistent basis) ends for students once they exit the college environment.

While college student drinking may not map neatly onto current definitions of alcohol abuse and dependence, drinking, particularly binge drinking is a continuing health concern on campuses nationwide (Keeling, 2002, Wechsler et al., 2002, Hingson, 2005). Despite increased attention on prevention programming, prevalence estimates show that rates of binge drinking have remained mostly stable, with 40-45% of college students endorsing this behavior (Keeling, 2002). Data indicate that underage drinkers consumed almost half of the alcohol consumed by all college drinkers, though their rates of binge drinking (43%) were somewhat lower than those of college students 21 and older (50.2%).

Wechsler, et al. (2002) compared results of the 2001 Harvard School of Public Health College Alcohol Study (CAS), which surveyed students at 119 4-year colleges and universities across the United States, to data from the three previous CAS studies conducted in 1993, 1997, and 1999. While rates of binge drinking remained relatively stable, an apparent trend of polarization of drinking continued, with more students either abstaining from use of alcohol or reporting frequent binge drinking episodes (3 or more times in the past two weeks) than in previous CAS reports. Specifically, women attending co-ed colleges showed a general trend toward increase in binge drinking prevalence (from 39.3% in 1993 to 41.2% in 2001). More notably however is that the prevalence of *frequent* binge drinking significantly increased across time from 17.4% to 21.2% (OR=1.27). In general, alcohol-related problems reported by students remained steady or slightly increased over the eight year interval. More specifically of interest, incidents of both engaging in unplanned sexual activity and unprotected sex increased significantly over time. Assault as a result of intoxication was not measured in this study.

While rates of binge drinking among college women are noteworthy, research efforts have also been geared toward documenting the consequences (to both the individual and community) of this level of drinking. Hingson et al. (2005) combined data from multiple national sources (e.g., National Highway Traffic Safety Administration, Center for Disease Control, etc.) in order to estimate the unintentional alcohol related injuries, deaths, and other health concerns of college students age 18-24. According to this study, approximately 1700 college students (per year) died from unintentional alcohol related injuries, nearly 600,000 students were injured (when measured in 2001), and 696,000 were assaulted by another drinking college student, and approximately 97,000 students (in 2001) reported being a victim of alcohol related sexual assault. Additional alcohol related consequences frequent among college students include unsafe

sex, academic problems, health problems, drunken driving, vandalism, police involvement, and property damage (Hingson et al., 2002, Wechsler et al., 2002, Wechsler et al., 1995).

Risk factor research for problem drinking, and substance abuse more generally, among adolescent samples tend to focus on categories of psychological functioning, family environment, peer relationships, and stressful life events (Kilpatrick et al., 2000, Nation & Heflinger, 2006). In contrast, research on risk factors for binge drinking among college populations focus more on environmental factors contributing to the high prevalence. For example, membership in fraternities/sororities and living arrangements have been noted as risk factors for binge drinking (Presley, Meilman, Leichliter, 2002, Wechsler et al., 1995). Strano et al. (2004) examined a group of variables that had previously received at least partial support as risk factors for college binge drinking including demographic variables, expectancies and perceived risk for alcohol use, environmental factors, age at first use, use of other drugs, and perceived social norms. Factors predicting episodes of binge drinking included membership in non-African-American ethnic group, membership in sorority or fraternity, having used other drugs in the past 30 days, positive alcohol expectancies, perception of minimal risk, perception that friends don't disapprove of binge drinking, and perception of high normative drinking. Factors predicting high frequency binge drinking were more limited and included being male, fraternity/sorority membership, use of other drugs, and perceptions that friends don't disapprove. These risk factors intimate that students who binge drink associate in groups where binge drinking is normative. Thus, women who binge drink may socialize within environs (e.g., greek functions, parties, etc.) that, when considered separately from actual levels of their own intoxication, place them at greater risk for sexual assault (Parks & Zetes-Zanata, 1999).

Section II: Alcohol-Involved Rape

The role of alcohol in the sequelae of sexual assault has received much attention. Presently, it appears that while alcohol use is frequently associated with risky sexual behaviors, these two domains are independent of one another, both falling under the more general domain of risk-taking behaviors (Vanzile-Tamsen, Testa, Harlow, & Livingston, 2006). Several mechanisms have been hypothesized through which women are placed at greater risk for assault. Several thorough reviews of the literature have addressed this topic (Abbey, 2002, Abbey et al., 2004, Testa, 2004, Testa & Parks, 1996), with all being in agreement that the relationship between sexual assault and alcohol use is most likely reciprocal, though not universally so, and most definitely multi-faceted. The aim of this section is to briefly summarize the recent literature on the alcohol-sexual assault association, giving particular attention to alcohol-involved rapes.

Alcohol Use as a Risk Factor. Two prominent theories emerge to frame the discussion of alcohol as a risk factor for sexual assault. One such theory is that drinking places women in dangerous, risky contexts such as in bars or parties around men who are also drinking. Thus this framework cites patterns of heavy drinking as a “macro-level,” or distal risk factor, for sexual assault (Ullman, 2003). Supporting this theory is a literature documenting men’s increased intent to aggress and actual aggression toward women while drinking (for review see Testa, 2002, Testa, 2004). As previously mentioned, there is evidence that the bar atmosphere, independent of a woman’s level of intoxication, is associated with risk for sexual assault (Parks & Zetes-Zanata, 1999).

A second theory concerns the direct effects of alcohol on women’s cognitive and motor abilities that have also been posited as a mechanism of risk. This area of research posits that common impairments caused by alcohol on motor functioning may decrease a woman’s ability

to physically resist assault (for review see Abbey, 2002, Testa & Parks, 1996). Additionally, the alcohol myopia theory posits that attention is given to most salient cues in an environment to the exclusion of less prominent cues (which may be risk cues), thus impacting the way that women process the input of information from their environment (Steele & Josephs, 1990). Research supporting this theory examines alcohol as a more proximal risk factor for sexual assault in that it limits women's ability to attend and respond to threat in their environment (Ullman, 2003).

Alcohol Use as an Outcome. While evidence generally supports alcohol as a risk factor for sexual assault, attention is also given to alcohol use as a result of sexual assault experiences. Rape and subsequent alcohol abuse have been strongly linked in both cross-sectional and longitudinal studies. Some evidence suggests that sexual assault may be an independent risk factor for substance abuse/dependence. Among a nationally representative sample of adolescents, those with a history of sexual assault were 4.55 times more likely to endorse substance abuse than those without an assault history (Kilpatrick, et al, 2000). Studies of adult women with a history of sexual victimization have found that between 27% and 37% reported experiencing alcohol problems across the span of their lifetime, compared to only 4%-20% of non-victimized women (Polusny & Follette, 1995; Burnam et al, 1988). Similarly, Miller et al. (1987) found that whereas only 20% of non-alcoholic women reported a history of child sexual abuse, 67% of alcoholic women reported such a history. The National Women's Study (NWS; Kilpatrick et al., 1997) provided one of the few longitudinal perspectives on the relation between sexual assault and alcohol use. It found that subsequent to an assault, women's odds of developing alcohol abuse increased significantly (odds ratio [OR] = 2.16). Humphrey and White (2000) found a similar result of sexual assault doubling the odds of heavy drinking in the following year.

However, some evidence suggests that prior levels of drinking are a larger contributor to

future drinking levels than assault experiences. Testa & Livingston (2000) longitudinally sampled a group of high-risk community women and found that time-two alcohol consumption and alcohol problems were predicted by time-one alcohol consumption, not by time-one sexual aggression. Other longitudinal studies examining the effects of other forms of aggression (e.g., intimate partner violence, physical violence) have produced similar findings (Demaris & Kaukinen, 2005; Testa, Livingston, Leonard, 2003; Testa & Leonard, 2001). Taken together, these findings suggest that drinking levels prior to rape may have a greater influence on drinking subsequent to traumatic events.

One posited mechanism for the relation between traumatic events and subsequent substance use is the self-medication hypothesis (for review see Stewart & Conrod, 2003). In this model, the psychoactive effects of alcohol are thought to numb the increased psychological distress often experienced as a result of rape (Levenson, Oyama, & Meek, 1987). As a result, alcohol use is then negatively reinforced in victims of rape, making drinking more rewarding and contributing to increased use of alcohol (Miranda et al, 2002). Along similar lines, rape victims report not only heavier alcohol consumption, but also report significantly higher tension reduction expectancies and more negative consequences associated with their drinking (Corbin, et al, 2001). In further support of the self-medication hypothesis, evidence suggests that symptoms of PTSD may, in certain instances, mediate the relationship between trauma and substance abuse (Chilcoat & Breslau, 1998; Chilcoat & Breslau, 1998b; Epstein et al, 1998; Stewart, 1996; Kessler, et al, 1995; Kilpatrick et al, 1994).

In sum, the association between alcohol use and sexual assault has been addressed from both the angle of risk factor and health outcome. In her most recent review of the literature on this topic, Testa (2004) surmised that the association was best viewed as reciprocal and moderate

to mixed at best when viewed in such broad categories as “substance use” and “violence or sexual assault.” Testa suggested that future research begin to undertake more focused questions, such as “under what circumstance does substance use influence violence?” To this effect, recent research has narrowed the scope of “sexual assault” to investigate the association between drinking and alcohol-involved rapes.

Incapacitated/Drug and Alcohol Facilitated Rape. Incapacitated or drug/alcohol facilitated rape (IR/DAFR) is defined as rape by means of the victim’s self-induced intoxication (incapacitated rape; IR) or by means of the perpetrator’s deliberate intoxication of the victim (drug- or alcohol-facilitated rape; DAFR). While included in most states’ legal definition of rape, it has recently begun to be distinguished from forcible/coercive rapes (FR) in which the perpetrator makes use of physical force, threat of force, or coercion as a tactic of rape (Kilpatrick et al, 2007).

Recent prevalence estimates afford a glimpse at the rates of IR/DAFR across a large portion of the lifespan. Rates are predictably lowest among adolescent samples, with overall prevalence among 12-14 year olds of 1% that increases to 4% among 15-17 year olds (McCauley et al, in submission). This overall prevalence rate continues to increase through the high risk period of early adulthood, with college women (18-34) reporting IR/DAFR at a rate of 6.4% (Kilpatrick et al., 2007). More applicable to the present study, rates of IR/DAFR within samples of sexual assault victims are striking. IR/DAFR accounts for 18% of all adolescent sexual assaults and nearly half to three-quarters of rape experiences among adult samples of victims (Kilpatrick et al, 2007, McCauley et al, 2007, Mohler-Kuo et al, 2004).

A small number of studies on adult sexual assault have begun to distinguish potential differences between forcible rape (i.e., rape by use of physical force or threat of force; FR) and

rape due to incapacitation with respect to rape characteristics and health outcomes. Testa, et al. (2003) examined differences in predictors of IR vs. FR, and reported that alcohol use prior to age 18 was associated only with IR and child sexual abuse was associated only with FR. IR also was more likely than FR to be perpetrated by a previous sexual partner and to have occurred after a woman had spent time at a bar or party. Having an older boyfriend, using marijuana, and using hard drugs prior to age 18 were associated with both FR and IR. Abbey et al. (2004) also found higher frequencies of alcohol use among victims of IR than victims of FR.

Kilpatrick et al. (2007) conducted a national survey of college women specifically addressing the prevalence, case characteristics, reporting, and health correlates of IR/DAFR in relation to FR. In general, they found that victims of IR/DAFR were significantly less likely to report their rape to authorities (7% vs. 16%). Victims of IR/DAFR were comparable to victims of FR in their rates of PTSD and depression. However, victims of IR/DAFR were almost twice as likely as victims of FR to endorse past year substance abuse problems. Taken together, these data suggest noteworthy differences between victims of FR and victims of IR, particularly with respect to problematic alcohol use.

McCauley et al. (2007) examined correlates of past year substance abuse and binge drinking among a national sample of college women. Variables considered as predictors included demographic characteristics, rape tactics (IR, DAFR, and FR), and rape characteristics (multiple victimizations, past year victimization, and known perpetrator). IR and DAFR were the only rape tactics to significantly relate to past year substance abuse (OR= 4.23 and OR=3.43, respectively) and past year binge drinking (OR = 3.03 and OR=2.34, respectively) in the full sample of victims and non-victims of rape. Among a sub-sample consisting solely of women with a victimization history, IR and DAFR remained the only significant rape tactic predictors, increasing the odds of

past year substance abuse by over 3 times (and placing women at over 4 times the risk for past year binge drinking. These findings suggest that perhaps the subset of victims experiencing alcohol-involved rapes may be the specific subset most likely to express continued patterns of heavy drinking and subsequently be at greater risk for revictimization.

Section III: Theories of Revictimization

Much empirical evidence exists to support the phenomenon of revictimization (Breitenbecher, 2001, Messman & Long, 1996, Rich et al., 2004). Sorrenson et al. (1991) sampled over 3,000 women in a community based survey on sexual assault experiences. Of those reporting at least one sexual assault, two-thirds reported more than one assault, with a mean of 3.2 assaults per person reported. Subsequently, many theories have been posited to explain the phenomenon of sexual revictimization. Although a large portion of them are either early in development or lacking in substantial support, it is beneficial to briefly highlight tenets of several of the most oft cited theories.

Traumagenic Dynamics. Finkelhor and Browne (1985) based their theory concerning the impact of childhood sexual abuse around four trauma-causing factors which they titled “traumagenic dynamics.” The four dynamics include: traumatic sexualization, betrayal, powerlessness, and stigmatization. The first dynamic, traumatic sexualization, refers to the inappropriate shaping of the child’s sexuality which manifests itself in several effects including repetitive sexual behaviors, promiscuous and compulsive sexual behaviors, higher risk for prostitution, confusion about sexual identity, and developing negative connotations associated with sex. The second dynamic of betrayal concerns the realization of the level of exploitation by a trusted individual and may later manifest itself in feelings of grief, depression, tendency toward abusive relationships, increased levels of hostility and anger, and difficulties in marital or

intimate partnerships. Powerlessness stems from the child's inability to prevent or avoid further victimization as a child. Powerlessness may manifest itself in adulthood as a dysfunctional need to control or dominate others. Finally, stigmatization references the negative implications of the abuse experience, such as blame, shame, and guilt. In a review of the conceptual models explaining the effects of childhood sexual abuse, Freeman and Morris (2001) note that while this model was a good starting point, the theory lacks general empirical support.

Traumagenic dynamics often serve as a starting point for more recently posited theories of revictimization. Breitenbecher (2001) reviewed the literature for empirical support of what she saw as eight main theories of revictimization: spurious relations, lifestyle/environmental, interpersonal relationship disturbances, cognitive attributions, self-blame/esteem, coping skills, risk perception, and general maladjustment. Perhaps most relevant to the current study, one posited theory of revictimization is that women with a history of victimization engage in lifestyles or are exposed to environmental factors that place them at higher risk for subsequent assault. One such factor of particular interest to the current study is alcohol abuse. However, Breitenbecher also includes variables such as number of consensual sexual partners, socioeconomic status, and marital status in this category as well. Breitenbecher notes that while some studies support the unique relationship between these variables and previous victimization in predicting revictimization (e.g., Greene & Navarro, 1998), other studies do not find this relationship (e.g., Gidycz et al., 1995). In sum, Breitenbecher determined that support for this theory of revictimization is partial. However, as noted in the introduction, previous studies examining alcohol's role in revictimization failed to differentiate between forms of rape (forcible vs. alcohol-involved rape). Variance in rates of alcohol-involved rapes measured (e.g., if the

study did not specifically assess for rape while too intoxicated to consent) could contribute to discrepant findings.

Learning Theory. Behavioral learning theories have been applied to explain the negative sequelae resulting from childhood sexual assault (CSA), including the revictimization phenomenon. Polusney and Follette (1995), based upon their review of the literature, concluded that many of the long-term negative effects of CSA may be categorized as various mechanisms of avoidance or tension-reduction strategies. As such, they applied Hayes' (1987) theory of emotional avoidance to explain many of the behavior patterns exhibited by CSA survivors. According to the theory, CSA serves as a distal factor that increases the likelihood that women would exhibit emotionally avoidant coping strategies, and that engaging these strategies may lead to more proximal stressors which further decrease their ability to functionally cope with sexual situations. An example of this theory may include increased use of alcohol in sexually risky situations as a means of emotional avoidance. However, the use of alcohol within this situation also serves as a proximal factor in decreasing the functioning capabilities of the woman and placing her at greater risk for revictimization. Additionally, Messman and Long (1996) proposed that the tenets of learning theory may operate in the context of revictimization such that early experiences of abuse may lead to the development of behaviors that are adaptive in their original context, but may later increase risk for subsequent victimization. For example, behaviors associated with victimization histories, such as higher numbers of sexual partners and less assertive behavior within dating relationships have been shown to predict revictimization (Greene & Navarro, 1998). Additional support for this model was provided by Norris, Nurius, and Dimeff (1996), who found that women with a history of victimization reported engaging in

more behaviors that have been identified as sexual assault risk factors. These behaviors consisted of an increased level of alcohol consumption and a greater number of sexual partners.

Risk Recognition Deficits. A third proposed theory of revictimization is risk recognition. That is, women with a history of sexual victimization exhibit difficulties identifying potentially risky situations (Calhoun & Wilson, 2000). Utilizing a response-latency paradigm, Wilson, Calhoun and Bernat (1999) found that women with a history of multiple victimizations took significantly longer to determine that a woman in a hypothetical date rape vignette was at risk. However, support for this mechanism remains mixed (Cloitre, 1998; Yeater & O'Donahue, 2002).

Although the aforementioned theories have garnered some support in the literature, the bulk of current literature elucidates potential mechanisms through which the relationship between previous and subsequent victimization is enacted. Gold, Sinclair, and Balge (1999) concluded that the field currently lacks a prominent theory explaining the phenomenon of revictimization and highlighted the need for closer examination of mechanisms of revictimization. They hypothesized that variables such as severe psychological symptoms resulting from previous abuse, poor coping styles, insecure attachment styles, hyperfemininity, delinquent behavior, drug use, and high risk sexual behavior may play mediating roles in the pathway to revictimization. Additionally, higher levels of adjustment problems, higher levels of dissociation, and increased levels of substance use have been proposed as mechanisms linking prior and subsequent victimization (Burgess & Holstrom, 1978; Cohen & Roth, 1987; Dancu, Riggs, Hearst-Ikeda, Shoyer, & Foa, 1996; Messman-Moore & Long, 2002). Many findings in this domain remain inconsistent in their support.

Few prospective studies have been conducted to examine possible predictors of revictimization. However, Gidycz et al. (1995), loglinear analyses of prospective data indicated that the chance of victimization at one time period was significantly predicted by victimization at the previous time periods, while potential mediating variables failed to consistently predict adult revictimization. Conclusions drawn from this study supported the previous findings of Mandoki and Burkhart (1989), that victimization is the strongest predictor of subsequent victimization. This finding was later replicated by Calhoun et al. (2002) who examined several potential predictors of revictimization, finding that prior victimization history was the strongest predictor of subsequent victimization.

Section IV: Risk Reduction Interventions

To this point, we have reviewed the high prevalence rates of binge drinking on college campuses, specifically with respect to prevalence among college women, and the more detrimental costs of this behavior. One such cost is the associated risk of sexual victimization. The alcohol-sexual assault literature was briefly reviewed, highlighting the need for more focused and strict operational definitions of both “alcohol use” and “sexual assault.” It was noted that to this aim, research has begun to differentiate alcohol-involved rape (IR/DAFR) from rapes perpetrated against sober victims. This research has demonstrated a potentially unique association between IR/DAFR and drinking problems among college women, an association that may place them at greater risk for revictimization. As such, basic prevalence and theories of the revictimization phenomenon were discussed in brief.

Due to the noteworthy prevalence of the problems of rape and heavy drinking among college women, attention has been given to intervention programming that address these issues. However, these interventions generally meet with mild to moderate success depending upon the

measured outcome. Moreover, interventions seem to either (a) target rape risk reduction, addressing outcomes of sexual assault without noting possible correlative changes in drinking behavior, or (b) target problem drinking behaviors, addressing outcomes of reduction in drinking and perhaps broadly defined risk taking behavior without noting potential related changes in sexual assault risk. For the most part, alcohol intervention literature remains distinct from that of sexual assault intervention programming. This dichotomy is reflected in the brief review of interventions discussed below.

Rape Risk Reduction Programming. A bulk of rape risk reduction programming at colleges and universities are purely educational in nature, targeted toward co-ed groups, and address attitude changes as outcomes (Sochting et al, 2004). Of the 21 programs of this nature reviewed by Lonsway (1996), approximately half showed a reduction in rape supportive attitudes. These outcome evaluations did not address actual risk reduction for their female participants, which is more in line with the aim of this review. Addressing the issue of risk reduction, a recent cumulative meta analysis of revictimization interventions found that the existing sample of program outcome studies measuring rates of sexual assault as their outcome have produced a “small beneficial effect” compared to no treatment at all, with programs targeted at women (versus co-ed) producing the most promising results (Hanson & Broom, 2005).

To date, six intervention programs have measured follow-up rates of sexual assault as their main outcome. Hanson and Gidycz (1993) targeted college females with programming that utilized video-taped vignette highlighting risk factors and addressed protective responses to the acquaintance rape scenario. The group produced reduced rates of sexual assault during the nine week follow-up for women with no prior history of sexual assault, but was of no benefit to

women with a history of prior victimization. Breitenbecher and Gidycz (1998) addressed this increased risk for assault among previously victimized women in their intervention programming, but this programming was found to be ineffective at reducing 9 week follow-up rates of sexual assault among both women with a previous victimization and women with no previous victimization.

More meager results were garnered from the intervention trials that followed those discussed above. Breitenbecher and Scarce (1999) assessed women at seven months post-intervention and found no differences in sexual assault rates despite group participants increased rape risk knowledge, perhaps highlighting the need to place information in a personally relevant context to increase motivation for behavior change outcomes. Gidycz et al. (2001) attempted to address this shortcoming by delivering psychoeducational material in a more interpersonally relevant context that allowed for “active group discussions” of educational material. Two month follow-up assessments found no difference between group participants and controls in rate of victimization. Differences did emerge at 6 months, with those having been moderately victimized at the two month follow-up and having received the group being less likely to be revictimized at the 6 month follow-up. The authors noted the mixed support for this program, and hypothesized that the intervention may have helped women keep violence from escalating over the time span from 2 to 6 months. More recently, Gidycz et al. (2006) added a self-defense module to supplement their basic psychoeducational programming. While the program, randomized to half of the 500 person sample, increased protective behaviors, but did not decrease rates of sexual victimization, increase assertive communication, or increase women’s rape avoidance self-efficacy.

While outcomes of programming aimed toward mixed audiences of previously victimized and non-victimized women have received meager support, programming specifically for women with a sexual assault history have had more promising results. Marx et al. (2001) tested a two-session intervention that utilized video vignettes (as had previous studies), psychoeducation on risk and protective factors, and personalized risk assessment delivered in a context that allowed for facilitated discussion among group members. At two month follow-up, members of the group intervention had significantly lower rates of revictimization (specific to rape and not milder forms of assault), with a prevalence of 12% versus the control group prevalence of 30% positive for revictimization. Of particular interest to the present study, of those revictimized from the intervention group, only 9% reported that their revictimization involved their own intoxication. This is in comparison to 66% of the control sample who reported alcohol-involved revictimization. While these results intimate that the intervention had some impact on alcohol use outcomes, this issue was not specifically addressed by the authors.

Alcohol Risk Reduction Programming. Although changes in drinking following rape risk reduction interventions have not previously been examined, a growing literature exists on the efficacy of brief motivational interventions targeting alcohol use among college heavy/problem drinkers. In an update on their 2002 review of individual-focused college drinking prevention strategies, Larimer and Cronce (2007) reviewed both published and unpublished outcome results of interventions tested between 1999 and 2006. Main conclusions of this review were that while no evidence emerged in support of purely informational interventions, personalized normative feedback based interventions produced modest reductions in drinking behaviors. Outcomes most strongly supported brief motivational interventions (BMIs) that incorporated personalized feedback, delivered in several formats including individual, group, or via mail/email. Finally, for

a small minority of the studies reviewed on BMIs, gender moderated the efficacy of the intervention, with women having more favorable outcomes than men.

Carey et al. (2007) conducted a meta-analysis using data from 62 published empirical studies of BMIs and found further support for their effectiveness at reducing both drinking levels as well as reducing drinking related problems. Moderator analyses of the data suggested that face-to-face interventions that utilized motivational interviewing techniques in combination with some form of personalized normative feedback made the greatest contribution to reduced alcohol related problems. Provision of personalized normative feedback has been found to be specifically beneficial to women with respect to reductions in alcohol related problems and ratings of alcohol dependence symptoms (Juarez et al., 2005). There is also evidence to suggest that BMIs are particularly effective when targeting problem drinkers, such as frequent heavy drinkers or those adjudicated for alcohol use when compared to other treatments or control (e.g., Bosari & Carey, 2005, Labrie et al., 2007, Wood et al., 2007). Finally, evidence supports the efficacy of these interventions when delivered in group formats and supports long-term maintenance of change for periods of up to one year or more (Carey et al., 2006, Larimer, Crounse, Lee, & Kilmer, 2004, Michael et al., 2006).

Several parallels may be drawn between the literature on rape risk reduction interventions and brief interventions for drinking among college students. First, both seem to be most effective when targeting specific populations (i.e., previously victimized women, problem drinkers). Second, literature in both areas supports the ineffectiveness of purely educational programming, specifically among populations at highest risk (i.e., previously victimized women, problem drinkers). Third, gender effects have been found in both areas, with female only groups being most effective for rape risk reduction programming, and with partial support for BMIs having

greater efficacy among female participants. Finally, and perhaps most importantly, the most effective interventions in both domains capitalized on motivational interviewing techniques to contextualize potential costs of engaging in risky behaviors. More specifically, interventions that included personalized risk assessments and face-to-face normative feedback have produced promising results with respect to both reduction in problematic drinking and reduced risk for revictimization.

Section V: Proposed Study

Calhoun et al. (2002), undertook a larger scale trial intervention program utilizing a multi-site, multiple follow up design and also garnered results of significantly reduced risk for revictimization among group participants (vs. control) through one year follow-up. While the program did include material on heavy drinking as a risk factor for assault and utilized personalized risk assessment techniques, similar to all previous rape risk reduction program outcome studies, the program's impact on drinking behavior has not yet been examined as a potential outcome of treatment.

References

- Abbey, A. (2002). Alcohol-related sexual assault: A common problem among college students. *Journal of Studies on Alcohol Supplement*, 14, 118-128.
- Abbey, A., Zawacki, T., Buck, P.O., Clinton, A.M., McAuslan, P. (2004). Sexual assault and alcohol consumption: what do we know about their relationship and what types of research are still needed? *Aggression and Violent Behavior*, 9, 271-303.
- Borsari, B., & Carey, K. B. (2005). Two brief alcohol interventions for mandated college students. *Psychology of Addictive Behaviors*, 19, 296–302.
- Brietenbecher, K. H. (2001). Sexual revictimization among women: A review of the literature

- focusing on empirical investigations. *Aggression and Violent Behavior*, 6, 415-432.
- Breitenbecher, K. H. & Gidycz, C.A. (1998). An empirical evaluation of a program designed to reduce the risk of multiple sexual victimization. *Journal of Interpersonal Violence*, 13, 472-488.
- Breitenbecher, K. H., & Scarce, M. (1999). Alongitudinal evaluation of the effectiveness of a sexual assault education program. *Journal of Interpersonal Violence*, 14, 459-478.
- Brower, A.M. (2002). Are college students alcoholics? *Journal of American College Health*, 50(5), 253-255.
- Burgess, A.W. & Holstrom, L.L. (1978). Recovery from rape and prior life stress. *Research in Nursing & Health*, 1, 165-174.
- Burnam, M.A., Stein, J.A., & Golding, J.M. (1988). Sexual assault and mental disorders in a community population. *Journal of Consulting and Clinical*, 56(6), 843-850.
- Calhoun, K.S. & Wilson, A.E. (2000). Rape and sexual aggression. In L.T. Szuchman and F. Muscarello (Eds.), *Psychological perspectives on human sexuality* (pp.573-602). Hoboken, NJ: John Wiley and Sons, Inc.
- Calhoun, K.S. & Gidycz, C.A. (2002). *Self-efficacy as a predictor of revictimization*. Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.
- Carey, K.B., Scott-Sheldon, L.A.J., Carey, M.P., & DeMartini, D.S. (2007). Individual level interventions to reduce college student drinking: A meta-analytic review. *Addictive Behaviors*, 32, 2469-2494.
- Carey, K. B., Carey, M. P., Maisto, S. A., & Henson, J. M. (2006). Brief motivational

- interventions for heavy college drinkers: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 74, 943–954.
- Chilcoat, H.D. & Breslau, N. (1998). Investigations of causal pathways between PTSD and drug use disorders. *Addictive Behaviors*, 23(6), 827-840.
- Chilcoat, H.D. & Breslau, N. (1998b). Posttraumatic stress disorders and drug disorders: testing causal pathways. *Archives of General Psychiatry*, 55, 913-917.
- Cloitre, M. (1998). Sexual revictimization: Risk factors and prevention. In V.M. Follette & J.I. Ruzek (Eds.), *Cognitive-behavioral therapies for trauma* (pp.278-304). New York: Guilford Press.
- Cohen, L.J. & Roth, S. (1987). The psychological aftermath of rape: Long term effects and individual differences in recovery. *Journal of Social & Clinical Psychology*, 5, 525-534.
- Corbin, W. R., Bernat, J. A., Calhoun, K. S., McNair, L. D., & Seals, K. L. (2001). The role of alcohol expectancies and alcohol consumption among sexually victimized and nonvictimized college women. *Journal of Interpersonal Violence*, 16(4), 297-311.
- Dancu, C.V., Riggs, D.S., Hearst-Ikeda, D., Shoyer, B. & Foa, E. (1996). Dissociative experiences and posttraumatic stress disorder among female victims of criminal assault and rape. *Journal of Traumatic Stress*, 9(2), 253-267.
- Demaris, A. & Kaukinen, C. (2005). Violent victimization and women's mental and physical health: Evidence from a national sample. *Journal of Research in Crime and Delinquency*, 42(4), 384-411.
- Epstein, J., Saunders, B.E., Kilpatrick, D.G., & Resnick, H.S. (1998). PTSD as a mediator between childhood rape and alcohol use in adult women. *Child Abuse and Neglect* 21(3), 223-234.

- Finkelhor, D. & Browne, A. (1985). The traumatic impact of child sexual abuse: A conceptualization. *American Journal of Orthopsychiatry*, 55(4), 530-541.
- Freeman, K.A. & Morris, T.L. (2001). A review of the conceptual models explaining the effects of child sexual abuse. *Aggression & Violent Behavior*, 6(4), 357-373.
- Gidycz, C.A., Hanson, K., & Layman, M. (1995). A prospective analysis of the relationships among sexual assault experiences: An extension of previous findings. *Psychology of Women Quarterly*, 19, 5-29.
- Gidycz, C. A., Lynn, S. J., Rich, C. L., Marioni, N. L., Loh, C., Blackwell, L. M., et al. (2001). The evaluation of a sexual assault risk reduction program: A multisite investigation. *Journal of Consulting and Clinical Psychology*, 69, 1073-1078.
- Gidycz, C. A., Rich, C. L., Orchowski, L., King, C., Miller, A.K. (2006). The evaluation of a sexual assault self defense and risk reduction program for college women: A prospective study. *Psychology of Women Quarterly*, 30, 173-186.
- Gold, S.R., Sinclair, B.B., & Balge, K.A. (1999). Risk of sexual revictimization: A theoretical model. *Aggression & Violent Behavior*, 4(4), 457-470.
- Greene, D.M. & Navarro, R.L. (1998). Situation-specific assertiveness in the epidemiology of sexual victimization among university women. *Psychology of Women Quarterly*, 22, 589-604.
- Hanson, R.K. & Broom, I. (2005). The utility of cumulative meta-analysis: Application to programs for reducing sexual violence. *Sexual Abuse: A Journal of Research and Treatment*, 17(4), 357-373.
- Hanson, K.A. & Gidycz, C.A. (1993). Evaluation of a sexual assault prevention program. *Journal of Consulting and Clinical Psychology*, 61(6), 1046-1052.

- Hayes, S.C. (1987). A contextual approach to therapeutic change. In N.S. Jacobsen (Ed.), *Psychotherapists in Clinical Practice: Cognitive Behavioral Perspectives* (pp.327-387). New York: Guilford Press.
- Hingson, R., Heeren, T., Winter, M. & Wechsler, H. (2005). Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18-24: Changes from 1998 to 2001.
- Humphrey, J.A. & White, J.W. (2000). Women's vulnerability to sexual assault from adolescence to young adulthood. *Journal of Adolescent Health*, 27, 419-424.
- Juarez, P., Walters, S. T., Daugherty, M., & Radi, C. (2006). A randomized trial of motivational interviewing and feedback with heavy drinking college students. *Journal of Drug Education*, 36, 233-246.
- Labrie, J.W., Thompson, A.D., Hutching, K., Lac, A., Buckley, K. (2007). A group Motivational Interviewing intervention reduces drinking and alcohol related negative consequences in adjudicated college women. *Addictive Behaviors*, 32, 2549-2562.
- Larimer, M.E. & Cronic, J.M. (2007). Identification, prevention, and treatment revisited: Individual-focused college drinking prevention strategies 1999-2006. *Addictive Behaviors*, 32, 2439-2468.
- Keeling, R.P. (2002). Binge drinking and the college environment. *Journal of American College Health*, 50(5), 197-201.
- Kessler, R.C., Sonuga, A., Bromet, E., Hughes, M. & Nelson, C.B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 52, 1048-1060.
- Kilpatrick, D.G., Acierno, R., Resnick, H.S., Saunders, B.E., & Best, C.L. (1997). A two year

- longitudinal analysis of the relationships between violent assault and substance use in women. *Journal of Consulting and Clinical Psychology*, 65(5), 834-847.
- Kilpatrick, D. G., Acierno, R., Saunders, B. E., Resnick, H. S., Best, C. L., & Schnurr, P. P. (1994). Risk factors for adolescent substance abuse and dependence: Data from a national sample. *Journal of Consulting and Clinical Psychology*, 68(1), 19-30.
- Kilpatrick, D.G., Acierno, R., Saunders, B.E., Resnick, H.S., Best, C.L., & Schnurr, P.P. (2000). Risk factors for adolescent substance abuse and dependence: Data from a national sample. *Journal of Consulting and Clinical Psychology*, 68(1), 19-30.
- Kilpatrick, D. G., Resnick, H. S., Ruggiero, K. J., Conoscenti, L. M., & McCauley, J. (2007). Drug-facilitated, incapacitated, and forcible rape: A national study. Final report submitted to the National Institute of Justice.
- Larimer, M.E., Crouce, J.M., Lee, C. M., Kilmer, J.R. (2004). Brief intervention in college settings. *Alcohol Research and Health*, 28(2), 94-104.
- Levenson, R.W., Oyama, O.N., & Meek, P.S. (1987). Greater reinforcement from alcohol for those at risk: Parental risk, personality risk, and sex. *Journal of Abnormal Psychology*, 96(3), 242-253.
- Lonsway, K. A. (1996). Preventing acquaintance rape through education: What do we know? *Psychology of Women Quarterly*, 20, 229-265.
- Mandoki, C.A. & Burkhart, B.R. (1989). Sexual victimization: Is there a vicious cycle? *Violence & Victims*, 4(3), 179-190.
- Marx, B.P, Calhoun, K.S., Wilson, A.E., & Meyerson, L.A. (2001). Sexual revictimization prevention: An outcome evaluation. *Journal of Consulting and Clinical Psychology*, 69(1), 25-32.

McCauley, J., Ruggiero, K.J., Conoscenti, L.M., Resnick, H.S. & Kilpatrick, D.G. (2007).

Forcible, Drug-Facilitated, and Incapacitated Rape in Relation to Binge Drinking and Substance Abuse: Results from a National Epidemiological Study. Poster submitted to the 41st Annual ABCT Convention, Philadelphia, PA.

McCauley, J., Ruggiero, K.J., Resnick, H.S., Conoscenti, L.M. (in submission). Incapacitated rape among adolescent girls: Prevalence, case characteristics, and substance use outcomes.

Messman, T.L. & Long, P.J. (1996). Child sexual abuse and its relationship to revictimization in adult women: A review. *Clinical Psychology Review*, 16(5), 397-420.

Michael, K.D., Curtin, L., Kirkley, D. E., Jones, D.L., & Harris, R, Jr. (2006). Group based motivational interviewing for alcohol use among college students: An exploratory study. *Professional Psychology: Research and Practice*, 37(6), 629-634.

Miller B.A., Downs, W.R., Gondoli, D.M., Keil A. (1987) The role of childhood sexual abuse in the development of alcoholism in women. *Violence and Victims*, 2, 157-172.

Miranda, R., Meyerson, L.A., Long, P.J., Marx, B.P., Simpson, S.M. (2002). Sexual assault and alcohol use: Exploring the self-medication hypothesis. *Violence and Victims*, 17(2), 205-217.

Mohler-Kuo, M., Dowdall, G.W., Koss, M.P., & Wechsler, H. (2004). Correlates of rape while intoxicated in a national sample of college women. *Journal of Studies on Alcohol*, 65, 37-45.

Nation, M. & Heflinger, C.A. (2006). Risk factors for serious alcohol and drug use: The role of psychosocial variables in predicting the frequency of substance use among adolescents. *The American Journal of Drug and Alcohol Abuse*, 32, 415-433.

- Norris, J., Nurius, P., & Dimeff, L. (1996). Through her eyes: Factors affecting women's perception of resistance to acquaintance sexual aggression threat. *Psychology of Women Quarterly*, 20, 123-145.
- Parks, K.A. & Zetes-Zanata, L.M. (1999). Women's bar-related victimization: Refining and testing a conceptual model. *Aggressive Behavior*, 25(5), 349-364.
- Presley, C.A., Meilman, P.W., & Leichter, J.S. (2002). College factors that influence drinking. *Journal of Studies on Alcohol Supplement*, 14, 82-90.
- Polusny, M.A. & Follette, V.M. (1995). Long-term correlates of child sexual abuse: Theory and review of the empirical literature. *Applied and Preventive Psychology*, 4(3), 143-166.
- Rich, C. L., Combs-Lane, A. M., Resnick, H. S., & Kilpatrick, D. G. (2004). Child sexual abuse and adult sexual revictimization. In L.J. Koenig, L.S. Doll, A. O'Leary, and W. Pequegnat (Eds.), *From child sexual abuse to adult sexual risk: Trauma, revictimization, and intervention*. (pp.49-68). Washington DC: APA.
- Sorenson, S.B., Stein, J.A., Siegel, J.M., & Burnham, M.A. (1987). The prevalence of sexual assault. *American Journal of Epidemiology*, 126, 1154-1164.
- Steele, C.M. & Josephs, R.A. (1990). Alcohol myopia: It's prized and dangerous effects. *American Psychologist*, 45(8), 921-933.
- Stewart, S.H. & Conrod, P.J. (2003). Psychosocial models of functional associations between posttraumatic stress disorder and substance use disorder. In P. Ouimette & P.J. Brown (Eds.), *Trauma and substance abuse: Causes, consequences, and treatment of comorbid disorders*. (pp.29-55). Washington DC: APA.
- Strano, D.A., Cuomo, M.J., & Venable, R.H. (2004). Predictors of undergraduate student binge drinking. *Journal of College Counseling*, 7, 50-63.
- Testa, M. (2004). The role of substance use in male-to female physical and sexual violence: A

- brief review and recommendations for future research. *Journal of Interpersonal Violence*, 19(12), 1494-1505.
- Testa, M. (2002). The impact of men's alcohol consumption on perpetration of sexual aggression. *Clinical Psychology Review*, 22(8), 1239-1263.
- Testa, M. & Leonard, K. (2001). The impact of marital aggression on women's psychological and marital functioning in a newlywed sample. *Journal of Family Violence*, 16(2), 115-130.
- Testa, M. & Livingston, J.A. (2000). Alcohol and sexual aggression: reciprocal relationships over time in a sample of high risk women. *Journal of Interpersonal Violence*, 15(4), 413-427.
- Testa, M., Livingston, J.A., & Leonard, K. (2003). Women's substance use and experiences of intimate partner violence: A longitudinal investigation among a community sample. *Addictive Behaviors*, 28, 1649-1664.
- Testa, M. & Parks, K.A. (1996). The role of women's alcohol consumption in sexual victimization. *Aggression & Violent Behavior*, 1(3), 217-234.
- Ullman, S.E. (2003). A critical review of field studies on the link of alcohol and adult sexual assault in women. *Aggression & Violent Behavior*, 8(5), 471-486.
- Vanzile-Tamsen, C., Testa, M., Harlow, L.L. & Livingston, J.A. (2006). A measurement model of women's behavioral risk taking. *Health Psychology*, 25(2), 249-254.
- Wechsler, H., Lee, J.E., Kuo, M., Seibring, M., Nelson, T.F. & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from four Harvard School of Public Health College Alcohol Study surveys: 1993-2001. *Journal of American College Health*, 50(5), 203-217.

- Wechsler, H., Moeykens, B. & Davenport, A. (1995). The adverse impact of heavy episodic drinkers on other college students. *Journal of Studies on Alcohol*, 56(6), 628-634.
- Wilson, A.E., Calhoun, K.S., & Bernat, J. A. (1999). Risk recognition and trauma related symptoms among sexually revictimized women. *Journal of Consulting and Clinical Psychology*, 67, 705-710.
- Wood, M.D., Capone, C., LaForge, R., Erickson, D.J., Brand, N.H. (2007). Brief motivational intervention and alcohol expectancy challenge with heavy drinking college students: A randomized factorial study. *Addictive Behaviors*, 32, 2509-2528.
- Yeater, E.A. & O'Donahue, W. (2002). Sexual revictimization: The relationship among knowledge, risk perception, and ability to respond to high risk situations. *Journal of Interpersonal Violence*, 17(11). 1135-1144.