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## Intimate Violence as it Relates to Risky Sexual Behavior Among At-Risk Females

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INTIMATE VIOLENCE AS IT RELATES TO RISKY SEXUAL BEHAVIOR  
AMONG AT-RISK FEMALES

BY

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
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OF

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## **ABSTRACT**

Rates of sexually transmitted infections (STIs) among adolescents are on the rise (CDCP, 2011). The majority of adolescents who contract STIs do so through risky sexual behavior (Alleyne-Green et al., 2012). Previous literature has identified multiple correlates of risky sexual behaviors among adolescents, including physical and sexual victimization, mental health concerns, and substance use. Few studies, however, have examined these relationships together in a comprehensive model. The primary purpose of this study was to examine whether relationship violence was related to risky sexual behavior, and whether mental health symptoms and substance mediated this hypothesized relationship. Cross-sectional design was used, and adolescent females (N=179), recruited from social service agencies, were 18.9 years old on average and were 37.2% White, 19.3% Black, 37.9% Multiracial and 5.6% other. Regression results revealed that females who were physically assaulted and sexually victimized by their intimate partners did engage in more sex without condoms. Mediation analyses indicated that PTSD symptoms significantly influenced the relationship between 1) physical assault and risky sexual behavior and 2) sexual victimization and risky sexual behavior. Converse to expectations, PTSD may act to reduce risk perhaps by reducing interest in sex. It is important to address victimization, PTSD and sexual risk in young women. More work is needed to understand these complex relationships using longitudinal designs. This study importantly assists in model-building efforts.

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Lastly, I would like to dedicate this product to my Great Grandmother, Jewell Marie Lockhart, the strength and foundation of my family and who will forever more be in my heart

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# CHAPTER 1

## INTRODUCTION

There has been an increase in rates of sexually transmitted infections (STIs) among adolescents in the United States (Centers for Disease Control and Prevention [CDCP], 2012). Although young adults reflect one quarter of the sexually engaged population, virtually half of newly reported STI cases are found in young adults (CDCP, 2012). Among female high school students, 12.6% have had life-time sexual intercourse with four or more people and 15.1% did not use condoms or any form of birth control during last sexual intercourse (CDCP, 2013). Additionally, recent national surveys indicate that among female adolescents, on average 30% are positive for chlamydia and 24% are positive for gonorrhea (CDCP, 2013). The majority of adolescents who contract HIV and STIs do so through risky sexual behavior (i.e., inconsistent condom use, multiple sexual partners, and poor sexual communication practices) (Alleyne-Green et al., 2012; Arriola et al., 2005; Pflieger et al., 2013). Due to this, several studies have sought to examine the underlying pathways that lead to risky sexual behavior among adolescents. One pathway that has recently received increased attention includes the role relationship violence plays in risky sexual behaviors among adolescents (Alleyne-Green et al., 2012; Allsworth et al., 2009; Smith et al., 2006). The primary purpose of this study is to examine whether physical assault and sexual victimization by an intimate partner predicts risky sexual behavior among a sample of at-risk female adolescents. Additionally, the current study seeks to examine whether mental health issues and substance use can help explain the

association between relationship violence (i.e., physical assault and sexual victimization by an intimate partner) and risky sexual behavior.

Female adolescents who come from disadvantaged backgrounds may be more susceptible to physical and sexual abuse (Freeman & Temple, 2010), which may directly or indirectly lead to mental health problems (Green et al., 2005), substance use (Goodkind et al., 2006), and risky sexual behaviors (Silverman et al., 2001). Although investigations involving adolescent females' risky sexual behaviors have recently received increased attention, the association between relationship violence and unhealthy sexual behaviors remains poorly understood (Green et al., 2005; Rizzo et al., 2012; Smith et al., 2006). The existing literature has identified multiple correlates of risky sexual behaviors among adolescents including physical assault, and sexual victimization by an intimate partner, post-traumatic stress disorder (PTSD), and depressive symptoms, but few studies have examined these relationships together in a comprehensive model (Green et al., 2005; Rizzo et al., 2012). Examination of factors related to risky sexual behavior among female adolescents from disadvantaged backgrounds, who are at risk for mental health problems, substance use and violence, is critical for identifying and implementing intervention programs and addressing treatment needs.

Furthermore, limited literature has investigated these factors among female adolescents involved in social service settings (i.e., community outpatient mental health agencies, juvenile justice settings, or residential social service agencies). Adolescent girls from these settings represent a very vulnerable, high risk and underserved population (Brady & Caraway, 2002; Zelechowski et al., 2013). A high

prevalence of adolescents involved in social services have experienced physical and sexual trauma by an intimate partner (Briggs et al., 2012; Jaycox et al., 2004). Collin-Vézina and colleagues (2011) found among a sample of adolescents in a residential setting, that females were more likely to have experienced physical and sexual abuse by an intimate partner (46%) compared boys (18%) and exhibit sexualized behavior. Additionally, a significant association has been found between traumatic experiences and risky sexual behavior among female juvenile offenders (Biswas et al., 2011). Although research has examined relationship violence and risky sexual behavior among female adolescents involved in social service settings, less is known about the underlying mechanisms of this relationship. The current study will therefore address existing gaps in the literature by examining the association between relationship violence and risky sexual behavior, and whether this association is mediated by substance use or mental health difficulty.

## CHAPTER 2

### REVIEW OF LITERATURE

#### **Physical Assault by an Intimate Partner**

Prior literature has suggested that adolescent females involved in physically abusive relationships have a higher likelihood of engaging in unhealthy sexual behaviors (Silverman et al., 2001; Wingood et al., 2001). Physical assault by an intimate partner can be defined as any physical violence involving a steady partner including pushing, shoving, slapping, or kicking (Alleyne-Green et al., 2012; Straus et al., 1996). Studies have associated physical assault from an intimate partner with inconsistent condom use (Coker, 2007), non-monogamous sexual partners (Wingood et al., 2001), and an increased risk of incident STIs (Allsworth et al., 2009). Among a sample of heterosexual African American and Hispanic adolescents, it was found that adolescents who were victims of physical assault by intimate partner were more likely to report having ever had coital sex and a higher number of sexual partners in the past year (Alleyne-Green et al., 2012).

Physical assault by an intimate partner may be related to risky sexual behaviors through a variety of pathways. Wingood and DiClemente (1997) found that heterosexual women in physically abusive relationships were less likely to negotiate condom use during sexual intercourse due to fear of domestic violence and abandonment. Similarly, fear of negotiating condom use has been significantly associated with a history of STIs among women who have been abused by their partners (Perrino et al., 2006; Wingood & DiClemente, 2000). Individuals with history of intimate partner physical abuse may exhibit low assertiveness and poorer

communication skills, which can play a role in risky sexual behavior (Morokoff et al., 1997). Additionally, women who have been abused by their partners are more likely to associate with sexually risky partners that, sequentially, may increase their engagement in unsafe sexual behaviors (El-Bassel et al., 1998; Testa et al., 2005). Men who physically abuse their partners have a higher likelihood of having multiple sex partners, which in turn is associated with risky sexual behavior (Testa et al., 2005). In support of this, a study of women in abusive relationships found that STI prevalence was higher among women who reported having unfaithful partners (Wingood & DiClemente, 2000).

### **Sexual Victimization by an Intimate Partner**

A number of studies have also examined the relationship between sexual victimization and risky sexual behaviors (Arriola et al., 2005; Gookind et al., 2006; Green et al., 2005; Hillis et al., 2001). Sexual victimization by an intimate partner can be defined as sexual coercion involving a steady partner that can include insisting on having sex without a condom or using force (i.e., hitting, holding down, or using a weapon) to make a partner have sex (French et al., 2014; Straus et al., 1996). History of forced sex by an intimate partner has been shown to be related to early initiation of voluntary sexual intercourse (Hillis et al., 2001; Molitor et al., 2000; Upchurch & Kusunoki, 2004). Sexual victimization as a child and as an adult has also been found to predict number of sexual partners (Arriola et al., 2005; Brener et al., 1999; Hillis et al., 2001; Molitor et al., 2000). Among a sample of young women involved in the juvenile justice system it was found that those who were sexually abused by an intimate partner were more likely to engage in risky sexual behaviors and have

multiple sexual partners in the last 6 months (Gookind et al., 2006). Additionally, there is evidence that forced sexual experiences with an intimate partner are associated with lower condom usage and higher frequency of sexually transmitted diseases (Kenney et al., 1997; Molitor et al., 2000; Upchurch & Kusunoki, 2004). There is also evidence that shows women who have been sexually victimized by intimate partners in the past have more difficulty refusing future sexual advances, which can be due to feelings of hopelessness and learned helplessness (Livingston et al., 2007). Individuals who experience sexual victimization by an intimate partner may often suffer mental and emotional disorders (Miller et al., 1995) or engage in substance use (Silverman et al., 2001) which might lead to risky sexual behavior (Brener et al., 1999).

### **Post-traumatic Stress Disorder Symptoms**

Relationship violence, including physical assault and sexual victimization, may increase sexually risky behavior through its relationship with post-traumatic stress disorder (PTSD) (Cavanaugh et al., 2010; Green et al., 2005; Smith et al., 2006). PTSD has been linked to both physical assault and sexual victimization (Dutton et al., 2006; Wolitzky-Taylor et al., 2008; Woods et al., 2005). Women who have met criteria for PTSD are also more likely to engage in risky sexual behavior such as inconsistent condom use, early sexual intercourse, and having intercourse before knowing a partner's sexual history (Hutton et al., 2001; Lang et al., 2003).

Although research has provided evidence that PTSD is related to relationship violence and risky sexual behavior, few studies have investigated whether PTSD mediates the relationship between relationship violence and risky sexual behaviors (Green et al., 2005; Lang et al., 2003; Smith et al., 2006). Green and colleagues'

(2005), studied trauma (e.g., loss, physical or sexual abuse) experienced after age 11 years in college women and found that those with PTSD were at a higher risk of engaging in unhealthy sexual behaviors. Specifically, they found that PTSD was related to dangerous sexual practices (e.g., increase in sexual partners, STIs, and abortions), being tested for HIV, and higher scores on a scale measuring dysfunctional sexual behaviors (e.g., sex used for non-sexual goals such as to obtain money, or to get love or attention).

### **Depressive Symptoms**

Similarly to PTSD, depressive symptoms can also be viewed as another pathway between relationship violence and risky sexual behavior. There is evidence that depressive symptoms are associated with both physical assault and sexual victimization by an intimate partner among female adolescents (Seth et al., 2011). Victims of relationship violence may experience low self-esteem and no sense of control over events affecting them (Rhodes et al., 1993). Depressive symptoms have also been strongly related to engaging in risky sexual behavior (Brown et al., 2006; Green et al., 2005; Seth et al., 2011). Findings indicate that high levels of depressive symptoms among adolescents are associated with inconsistent condom use, multiple sexual partners, incidence of STIs, poor sexual communication practices, and sex at first meeting (Brown et al., 2006; Green et al., 2005; Seth et al., 2011; Seth et al., 2009). Individuals exhibiting depressive symptoms may engage in unhealthy decision making in sexual situations or feel pressure to have sex to avoid rejection (Lehrer et al., 2006; Sales et al., 2009). Although correlates of depressive symptoms have been linked to relationship violence and risky sexual behavior, less is known about whether

depressive symptoms mediate the relationship between the two (Green et al., 2005; Seth et al., 2011).

### **Alcohol Use**

Another way that interpersonal violence may increase sexually risky behavior is through alcohol use. Researchers have demonstrated that adolescents with a history of relationship violence are more likely to report higher rates of alcohol use (Goodkind et al., 2006; Lang et al., 2005; Silverman et al., 2001; Shorey et al., 2011; Temple & Freeman, 2011). Survivors of sexual and physical abuse by an intimate partner may use alcohol as a coping mechanism from the mental and emotional distress they experienced, which can potentially put them at even more risk (Burnam et al., 1988; Leidig, 1992; Rhodes et al., 1993). Multiple studies have also identified a link between adolescent alcohol use, unprotected sex, and multiple sex partners (Duncan et al., 1999; Guo et al., 2002; Tapert et al., 2001). Because victims of relationship violence may be more prone to alcohol use, they may have a higher likelihood of engaging in alcohol use before sexual intercourse. Alcohol use can impair cognitive ability to perform safer sexual practices (Biglan et al., 1990; Hingson et al., 1990; White, 1997).

### **Marijuana Use**

In addition to alcohol use, marijuana use can be seen as another pathway between relationship violence and risky sexual behavior. There is evidence that women who have suffered physical and sexual abuse by an intimate partner are more likely to engage in marijuana use (Brener et al., 1999; Nowotny & Graves, 2013; Temple & Freeman, 2011). In a study investigating the association between dating



violence and substance use among a sample of high school students, it was found that adolescent victims were almost 3 times more likely to smoke marijuana (Temple & Freeman, 2011). Researchers have also shown that adolescents who smoke marijuana are more likely to engage in risky sexual behavior (Bryan et al., 2012; Parks et al., 2012). Previous literature has demonstrated that among a sample of incarcerated adolescents marijuana use was frequently utilized in conjunction with sexual behaviors (Rosengard et al., 2006). Bryan and colleagues (2012) explored the relationship between marijuana use and risky sexual behavior among a sample of female adolescents on probation and found that females were less likely to use condoms and more inclined to have sexual intercourse with strangers if marijuana was being used. Women have been shown to report poorer memory performance (Thoma et al., 2011), an increase in sexual desire (Gorzalka, et al., 2010), and an increase in risk taking (Lane, et al., 2005) after smoking marijuana which can ultimately put women at more risk to engaging in unsafe sexual behavior.

### **Current Study**

Although a plethora of studies have examined the influence of violent relationships, substance use, and mental health problems on risky sexual behavior, only a limited number of studies have investigated these associations together in a comprehensive model (Green et al., 2005; Rizzo et al., 2012). Moreover, few studies have examined these influences among female adolescents involved in social service settings (Brady & Caraway, 2002; Zelechowski et al., 2013).

The specific aims of this study were to: 1) Test whether physical assault and sexual victimization by an intimate partner predict risky sexual behavior among

females involved in social service settings. It was hypothesized that physical assault and sexual victimization by an intimate partner would be significantly and positively related to risky sexual behavior. 2) Determine whether PTSD and depressive symptoms, which are often psychological reactions to abuse, and substance use, such as alcohol and marijuana use, mediate the association between relationship violence (i.e., physical assault and sexual victimization) and risky sexual behaviors among at-risk females. It was hypothesized that intimate partner violence (physical and sexual) would be significantly and positively related to PTSD and depressive symptoms, and to alcohol and marijuana use, which in turn would be significantly positively related to risky sexual behaviors.

### **Study Significance**

Complex mediation models will be employed to accomplish the above aims and test hypotheses. Such an approach is relatively rare, yet needed, in the literature (Preacher & Hayes, 2008). Studies using complex designs frequently omit specific hypotheses, do not use recommended bootstrapping parameter estimates with confidence intervals, and fail to examine the impact of specific indirect effects on models (Rungtusanatham, Miller & Boyer, 2014). Because this study incorporates several constructs within models, it can advance model-building for future studies, even in the face of a non-significant total indirect effect (which indicates overall mediation in the complex model) and/or non-significant specific indirect effects (which indicate the contribution of a specific proposed mediator within the context of the entire model) (Zhao, Lynch & Chen, 2010; Rungtusanatham et al, 2014; Preacher & Hayes, 2008).

## CHAPTER 3

### METHODOLOGY

*Research Design.* To determine whether physical assault and sexual victimization by an intimate partner predicts risky sexual behaviors and whether mental health problems and substance use mediate these relationships, data were analyzed using a cross-sectional design. The predictor variables included physical assault and sexual victimization by an intimate partner, and mediating variables included PTSD symptoms, depressive symptoms, alcohol use, and marijuana use. The outcome variables consisted of risky sexual behaviors including sex without condoms, sex without other contraception, and incident STIs.

*Participants.* The sample consisted of 179 sexually active adolescent females, who were not pregnant and who planned on engaging in coital sex within the next 6 months at the time of recruitment. Racial composition of the sample was 37.2% White, 19.3% Black, 37.9% Multiracial, and 5.6% other; ethnic makeup included 42.5% Hispanic girls; and mean (*M*) age of girls was 18.7 years (standard deviation, *SD*, was 1.88). Participants were recruited from four social service settings including juvenile justice, community outpatient mental health, alternative schools, and residential social services from the Northeast (See Appendix A).

#### **Measures**

##### *Predictor Measures*

*Physical Assault and Sexual Victimization.* Physical assault and sexual victimization were measured using the Conflict Tactics Scale (CTS2; Straus et al., 1996; Straus & Douglas, 2004). The CTS2 measures tactics used during relationship

conflicts: Negotiation, physical assault and psychological aggression. In addition, it includes two supplemental scales: Injury from assault and sexual coercion.

Respondents rate ten items regarding their own behavior during the last 3 months (e.g., “I insulted or swore or shouted or yelled at my partner”) and the same 10 items regarding partner behaviors (e.g., “My partner insulted or swore or shouted or yelled at me”) on the following scale: Once (coded as 1), Twice (2), 3 times (3), 4-6 times (5), 7-12 times (10), more than 12 times (coded as 15). In addition, the following are coded: The tactic was not used in the last 3 months, but occurred before that (7); and the tactic was never used (8). Items coded as 7 were excluded because proximal events (last 3 months) were of interest. Items coded as 8 were recoded as 0 for past 3 months. For purposes of this study, items reflecting severe physical assault on respondent and severe sexual coercion (i.e., sexual victimization) of respondent were utilized. Physical assault and sexual victimization were positively skewed, therefore these variables were transformed using a log transformation.

*Post-traumatic Stress Disorder Symptoms.* PTSD symptoms were measured using the PTSD Checklist-6 (PCL-6; Lang & Stein, 2005; Lang, Wilkins, Roy-Byrne et al., 2012; Weathers, Litz, Herman, Huska & Keane, 1993). The PCL-6 is a brief screener that assesses whether a respondent has had any stressful experiences affecting them in the last month. All 6 items were rated on a 5-point Likert scale ranging from not at all (1) to extremely (5) and a single score is produced ( $\alpha = .79$ ; Lang et al., 2012). A score  $\geq 14$  indicates a positive screen (Lang & Stein, 2005).

*Depressive Symptoms.* Depressive symptoms were assessed with the Center for Epidemiological Studies-Depression Scale (CES-D; Melchoir et al., 1993). The

CES-D is designed to detect the presence and severity of depressive symptoms in the past week. All 10 items were rated on 4-point Likert scale ranging from rarely or none of the time (0) to most or all of the time (3), producing a single summary score ( $\alpha = .88$ ; Zhang et al., 2012). A cut off score of 10 indicates significant Depressive symptoms (Andresen et al., 1994; Bradley et al., 2010).

*Substance Use.* Alcohol and marijuana use was assessed using a demographics questionnaire. In addition to obtaining demographic information, this questionnaire gathers information on drug and alcohol history. Participants were asked the number of days in the last 12 months that they have used alcohol, and this inquiry is repeated for marijuana. Trained Research Assistants (RAs) helped participants to recall and estimate use patterns so that a final “days of use” could be provided. Although “days of use” over 12 months may not be entirely accurate, this metric can be an important indicator of risk for alcohol (NIAAA, 2011) and was extended for marijuana use. Number of days of alcohol use (and number of days of marijuana use) was used in the analyses. The responses were positively skewed, therefore the alcohol use variable was transformed using a log transformation and the marijuana use variable was transformed using a square root transformation.

#### *Outcome Measures*

*Risky Sexual Behavior.* Risky sexual behavior was measured using the Timeline Follow-back (TLFB; Carey et al., 2001; Sobell et al., 1992). The TLFB provides summary scores for total number of days of sexual intercourse without condoms and total number of days of sexual intercourse without birth control over the past 90 days. Preliminary analyses revealed that the total number of days of sexual

intercourse without birth control was relatively low; therefore, the primary focus is on total number of days girls had sexual intercourse without a condom. The responses were positively skewed, therefore these variables were transformed using a square root transformation.

Risky sexual behavior was measured through incidence of STIs. Participants at baseline were tested for chlamydia, gonorrhea, and trichomoniasis through biological testing (self-administered vaginal swabs or urine sample). The results of the STI test were recorded using a Bio-specimen form. The three STI dichotomous items were re-coded into one composite score indicating whether or not a participant screened positive for 0, 1, 2, or 3 STIs. Preliminary analyses revealed that the prevalence rates for STIs were relatively low; therefore, the primary focus remains on total number of day's girls had sexual intercourse without a condom.

### **Procedures**

The current study is a secondary data analysis of a randomized clinical trial (R01 HD065942-03S1; PI-Stein) testing the efficacy of behavioral intervention versus psycho-education in reducing STIs and pregnancy among female adolescents recruited from social service settings. Data for this study were obtained at baseline before intervention was provided. All procedures received Institutional Review Board approval.

Female adolescents involved in social service settings were invited to participate in the study. Trained RAs approached females at recruitment sites to introduce the study. RAs explained the purpose of the study to interested females, the voluntary nature of participation, and confidentiality. All procedures were explained

and written informed consent was utilized. Following the consent process, the baseline assessment was conducted using a computer program facilitated by an RA who provided clarification and administered the program. The program included all of the above described measures, and took approximately 90 minutes. Participants received \$25 for the assessment.

### *Analytic Approach*

Prior to performing analyses, variables were checked for distributional assumptions and transformed or recoded as warranted (see measures). Descriptive statistics and bivariate correlations were calculated for all predictor and outcome variables. Exploratory analyses were conducted to determine whether participants differed on demographic variables (i.e., age and race/ethnicity) across the various types of recruitment settings (i.e., justice, outpatient, alternative school, residential). Analyses were also conducted to determine whether participants from each type of agency differed on the predictor and potential mediating variables (i.e., physical assault, sexual victimization, PTSD symptoms, depressive symptoms, alcohol use, and marijuana use) in addition to the outcome variable (i.e., number of days had intercourse without condom). A series of Analyses of Variance (ANOVAs) and chi-square analyses revealed that the only significant difference found across the various types of recruitment settings was age,  $F(3,139) = 4.04, p < .05$ . Therefore, age was set as a covariate for the following analyses and the data were collapsed across settings.

Multiple regression analyses were conducted in order to examine whether relationship violence (i.e., physical assault and sexual victimization) predicted risky sexual behavior (i.e., number of days had sexual intercourse without condoms), after

controlling for age. Multiple mediation analyses (Hayes, 2013) were conducted in order to determine if the mental health (i.e., PTSD and depressive symptoms) and substance use variables (i.e., alcohol and marijuana) mediate the relationship between physical assault and number of days had sexual intercourse without condoms, after controlling for age. Multiple mediation analyses were also conducted in order to determine if the mental health concerns and substance use mediate the relationship between sexual victimization and number of days had sexual intercourse without condoms, after controlling for age.

Mediators can be seen as intervening variables that help completely or partially explain the relationship between a variable and an outcome (Shrout & Bolger, 2002). Multiple mediation analyses can reduce the likelihood of parameter bias and increase power (Preacher & Hayes, 2008). Additionally, mediation analyses can be used to test paths from predictor to mediator variables (i.e., the path denoted by  $a$ ) and from mediator to outcome variables (i.e., the path denoted by  $b$ ). The direct effect of the predictor variable on the outcome variable is also calculated (i.e., the path denoted by  $c'$ ), as is the total effect ( $c$ ), and  $R^2$  for the model. Two multiple mediator statistical models were calculated, one with physical assault as the independent variable (IV) and one with sexual victimization as the IV. For these analyses,  $a_i$  paths represented the effects of physical assault (or sexual victimization) on mediator variables (i.e., PTSD, depressive symptoms, alcohol, marijuana use);  $b_i$  paths represented the effects of mediators on number of days had sexual intercourse without condoms; and path  $c'$  represented the direct effect of physical assault (or sexual victimization) on number of days had sexual intercourse without condoms. The total indirect effect ( $\sum a_i b_i$ ) for each



model was calculated, along with confidence intervals (CIs) using bootstrap methods. This was followed by tests of indirect effects ( $a_i b_i$ ) for each mediator in the context of the multiple mediator model, again using bootstrap CIs. Indirect effects with CIs not including zero indicate significant mediation effects (Zhao et al., 2010). Hayes model number 6 was tested (Hayes, 2013), which included four mediators (PTSD, and depressive symptoms, and alcohol, and marijuana use), the IVs (physical assault or sexual victimization), and the dependent variable (DV, number of days girls had intercourse without condoms), while covarying for age. Data analyses were performed using SPSS 22.0 (2013). Finally effect sizes are presented, as recommended by Preacher and Kelley (2011), in terms of the ratio of the total indirect effect to total effect ( $P_M = \sum a_i b_i / [\sum a_i b_i + c']$ ) for the overall model, and in terms of the ratio of the indirect effect for specific mediators to the total effect for the model ( $a_i b_i / [\sum a_i b_i + c']$ ), with .01, .09 and .25 representing small, medium and large effect sizes, respectively (Cohen, 1988). Although these effect size metrics are limited for sample sizes under 500, cross sectional designs, violations of normality and multiple mediator models, they are presented because they are common, there are currently few other options, and they can be cautiously interpreted in context (Preacher & Kelley, 2011).

## CHAPTER 4

### FINDINGS

#### *Descriptives*

Descriptive statistics for the predictor variables and outcome variables are shown in Table 1. Using untransformed data, the average physical assault score was .81 ( $SD = 2.69$ ;  $Med = .00$ ) and the average score of sexual victimization was .62 ( $SD = 2.16$ ;  $Med = .00$ ). There were 29 (16.2 %) female adolescents who reported being physically assaulted by a steady sexual partner and 31 (17.3%) female adolescents who reported being sexually victimized by a steady sexual partner. Using untransformed data, the average number of days the participants reported drinking alcohol in the last 12 months was 24.04 days ( $SD = 45.39$ ;  $Med = 4.00$ ), indicating a moderate level of risk (NIAAA, 2011). Using untransformed data, the average number of days the participants reported smoking marijuana in the last 12 months was 76.58 days ( $SD = 118.35$ ;  $Med = 10.00$ ), indicating some risk for a substance use disorder (Levy et al., 2014). The average CES-D score was  $M = 12.67$  ( $SD = 6.01$ ), indicating moderate levels of depressive symptoms for the sample (125 out of 179 participants screened positive for depressive symptoms). Average PCL-6 score was  $M = 17.45$  ( $SD = 6.58$ ), again indicating moderate levels of PTSD symptoms (124 out of 179 screened positive for PTSD symptoms). Using untransformed data, there were 61 (34.1%) female adolescents who reported having sex without condoms ( $M = 13.32$ ,  $SD = 33.12$ ,  $Med = 2.00$ ).

### *Correlations*

Bivariate correlations for the predictor variables and outcome variables are shown in Table 1. Physical assault was positively correlated with sexual victimization, severity of PTSD and depressive symptoms, and the number of days girls had intercourse without a condom. Sexual victimization was positively associated with severity of PTSD and depressive symptoms and number of days girls had intercourse without a condom. Greater severity of depressive symptoms was related to greater severity of PTSD symptoms. Greater severity of PTSD symptoms was also associated with higher frequency of smoking marijuana. Higher frequency of drinking alcohol was correlated with higher frequency of smoking marijuana. Lastly, higher frequency of smoking marijuana was positively related to number of days girls had intercourse without a condom. Although significant relationships were found among variables, generally, the constructs do not evidence collinearity.

### *Main Analyses*

A multiple regression was performed to evaluate whether physical assault and sexual victimization predicted number of days girls had intercourse without a condom, after controlling for age (See Figure 1). The results of the regression indicated that the model explained 18.2% of the variance ( $R^2 = .182$ ,  $F(3,160) = 11.66$ ,  $p < .01$ ). It was found that both physical assault ( $\beta = .33$ ,  $p < .001$ ) and sexual victimization ( $\beta = .16$ ,  $p < .05$ ) predicted sexual intercourse without a condom, ( $\beta =$  standardized beta).

A multiple mediation analysis was conducted to determine whether mental health concerns and substance use mediated the relationship between physical assault by an intimate partner and number of days girls had intercourse without a condom (see

Figure 2). The total indirect effect ( $\Sigma a_i b_i$ ) was not significant,  $b = 0.094$ , [95% bias-corrected bootstrap confidence interval (BCa CI) = -0.429, .908; effect size (ES) = 0.025 (small ES)], indicating no mediation in the overall model. For the overall model,  $R^2_{adj} = 0.178$ ,  $F(6, 163) = 5.874$ ,  $p < 0.001$ , and for the total effect ( $c$ ),  $b = 3.727$ ,  $p < 0.001$ . Indirect effects were then calculated to determine the importance of individual mediators ( $a_i b_i$ ) within the context of the multiple mediator model. There was a significant indirect effect of physical assault on number of days of intercourse without a condom through PTSD symptoms,  $b = -0.295$ , [95% BCa CI = -0.876, -0.029; ES = 0.079 (small – medium ES)], indicating that PTSD symptoms significantly mediated the relationship between physical assault and number of days of intercourse without a condom. However, there was no significant indirect effect of physical assault on number of days of intercourse without a condom through other mediators and so ES not shown for those. In particular, for depressive symptoms,  $b = 0.169$  [95% BCa = -0.090, .573], for alcohol use,  $b = -0.082$  [95% BCa = -0.478, 0.027], and for marijuana use,  $b = 0.303$  [95% BCa = -0.008, 1.073], indicating that depressive symptoms, alcohol use, and marijuana use did not mediate the relationship between physical assault and number of days of intercourse without a condom.

Another multiple mediation analysis was conducted to determine whether mental health concerns (i.e., PTSD and depressive symptoms) and substance use (i.e., alcohol and marijuana) mediated the relationship between sexual victimization and risky sexual behavior (i.e., sexual intercourse without a condom) (see Figure 3). The total indirect effect ( $\Sigma a_i b_i$ ) was not significant,  $b = 0.097$ , [95% BCa CI = -0.467, .856; ES = 0.025 (small ES)], indicating no mediation in the overall model. For the

overall model,  $R^2_{adj} = 0.148$ ,  $F(6, 157) = 6.417$ ,  $p < 0.001$ , and for the total effect ( $c$ ),  $b = 3.821$ ,  $p = 0.001$ . Indirect effects were then calculated to determine the importance of individual mediators ( $a_i b_i$ ) within the context of the multiple mediator model. There was a significant indirect effect of sexual victimization on number of days of intercourse without a condom through PTSD symptoms,  $b = -0.343$ , [95% BCa CI = -1.165, -.008; ES = 0.090 (medium ES)], indicating that PTSD symptoms significantly mediated the relationship between sexual victimization and number of days of intercourse without a condom. However, there was no significant indirect effect of sexual victimization on number of days of intercourse without a condom through other mediators and so ES not shown for those. In particular, for depressive symptoms,  $b = 0.183$  [95% BCa = -0.101, .754], for alcohol use,  $b = 0.038$  [95% BCa = -0.061, 0.313], and for marijuana use,  $b = 0.219$  [95% BCa = -0.075, 1.048], indicating that depressive symptoms, alcohol use, and marijuana use did not mediate the relationship between sexual victimization and number of days of intercourse without a condom.

## CHAPTER 5

### CONCLUSION

The current study examined whether physical assault and sexual victimization predicted risky sexual behavior and whether mental health concerns and substance use mediated the relationship between relationship violence (i.e., physical assault and sexual victimization) and risky sexual behaviors (number of days girls had intercourse without condoms) among at-risk females. It was found that female adolescents who reported being physically assaulted by their intimate partner had a significantly higher risk of engaging in sex without a condom. The results of the current study confirm findings of previous literature reporting that women with a history of physical abuse from their intimate partner have a higher chance of engaging in unhealthy sexual behaviors (Silverman et al., 2001; Wingood et al., 2001). In particular, research has shown that women who are in physically abusive relationships are less likely to negotiate condom use during sex due to fear of future domestic violence (Wingood & DiClemente, 1997). Additionally, the results suggested that female adolescents who indicated being sexually victimized by their intimate partner had a significantly higher risk of engaging in sex without a condom. The findings of the current study corroborate results of prior research reporting that women who have experienced forced sexual activities with an intimate partner have a higher likelihood of engaging in risky sexual behaviors (Arriola et al., 2005; Molitor et al., 2000; Upchurch & Kusunoki, 2004).

Two multiple mediator models were analyzed to predict days of intercourse without condoms, taking into account several mediators (PTSD and depressive

symptoms, and days used alcohol and marijuana) and age as a covariate: First with intimate partner physical abuse as the predictor, then with sexual victimization by intimate partner as the predictor. In both models, direct effects ( $c'$ ) were significant, whereas the total indirect effects ( $\sum a_i b_i$ ) were non-significant, indicating no mediation for the complex models. This suggests additional mediators need to be added to models in future work (Rungtusanatham et al, 2014; Zhao et al, 2010). Interpretation of significant direct effects ( $c'$ ) for both complex models indicates (see Rungtusanatham et al, 2014): 1) One unit change in intimate partner physical assault leads to an 3.633 unit change in days girls had intercourse without condoms, holding all mediators constant, and 2) One unit change in intimate partner sexual victimization leads to an 3.724 unit change in days girls had intercourse without condoms, holding all mediators constant. These relationships were expected. Further, interpretation for the significant indirect effects ( $a_i b_i$ ) for PTSD symptoms indicates that, holding all other mediators constant, one unit change in physical assault by an intimate partner leads to a -0.295 change in days girls had intercourse without condoms, by physical assault influencing PTSD symptoms. The negative sign was not expected and represents an effect size (0.079) approaching the medium range (Kenny, 2015). Additionally, the results indicate that, holding all other mediators constant, a one unit change in sexual victimization by an intimate partner leads to a -0.343 change in days girls had intercourse without condoms, by sexual victimization influencing PTSD symptoms. The negative sign was also not expected and represents an effect size (0.090) in the medium range (Kenny, 2015). Ultimately, PTSD was associated with a decrease in the number of days girls had intercourse without condoms.

Unexpected results can assist in model-building. Prior research has looked at only portions of the model presented here. For example, Cavanaugh and colleagues (2010) found that low-income women who had experienced PTSD related to intimate partner violence had increased chances of engaging in sexually risky behavior. Similarly, delinquent girls who had experienced life-time trauma, but not necessarily PTSD, were at greater risk to engage in risky sexual behaviors (Smith et al., 2006). The models tested here were comprehensive in inclusion of multiple mediators, and tested total mediating effects as well as effects of single mediators. In this study, the presence of depressive symptoms and substance use (i.e., marijuana and alcohol use) did not mediate the relationship between relationship violence (i.e., physical assault and sexual victimization) and number of days girls had intercourse without condoms. The lack of significant mediation effects could in part be because measures assessed behavior using different lengths of time (i.e., relationship violence covered past 3 months, PTSD symptoms covered past month, depressive symptoms covered past week, substance use covered past 12 months, and intercourse without condoms covered past 3 months). We also do not know if PTSD symptoms resulted from physical assault, and some of our constructs (i.e., PTSD and depressive-symptoms) were comprised of screeners, not diagnostic assessments. Another potential limitation of the current study was the cross-sectional nature of the study, which precludes determination of the temporal and causal nature of relationships. In addition, it is possible that participants could have misreported their experiences of violence, mental health symptoms, or substance use. On the other hand, girls were assured that their reports were private and confidential. Literature suggests that youth respond generally



accurately even on sensitive topics when they believe reports are confidential (Brenner et al., 2003).

The literature reviewed here was based on samples drawn from a variety of settings such as community mental health centers, colleges, prisons, and included mostly adult samples with less racial and ethnic diversity than the current sample (Goodkind et al., 2006; Shorey et al., 2011; Wingwood et al., 2001). The current study focused on a high need sample from social service settings, comprised of participants who were young (44.6% were adolescents), Hispanic (42.5%), and non-White (62.8%). These differences in samples could in part account for unexpected results and can be considered in future recruitment strategies and model building. It may be found that mediators accounting for the relationship between relationship violence and risky sex differ by sample type. More work is needed.

In conclusion, intimate partner violence (both physical assault and sexual victimization) was associated with risky sex as hypothesized. Unexpected but informative results indicated that physical assault and sexual victimization by an intimate partner reduced sex risk, through PTSD symptoms. The complex multiple mediator models need refinement in future work to determine if results can be replicated, especially in longitudinal designs, and to identify mediators more completely. The current study suggests that PTSD symptoms may act to reduce interest in sex and thereby reduce opportunity for sex, but more work is needed in this area. This study has many strengths including a diverse sample with respect to age, ethnicity, race and recruitment setting. This supports generalizability of results. Methodological strengths include specific hypotheses, use of bootstrap CIs, multiple

mediator modeling, examination of specific indirect effects for single mediators within complex models, and attention to effect size (Preacher & Hayes, 2008; Preacher & Kelly, 2011; Shrout & Bolger, 2002; Zhao et al., 2010). Additionally, the hypothesized mediational sequences were supported by current literature and provide the basis for more complex longitudinal studies that examine these relationships in more detail. Girls who have experienced relationship violence are at risk for unprotected sex. Although PTSD symptoms may act to decrease this risk according to current findings, it is important to reduce both PTSD symptoms and sex risk for persons involved in violent relationships.

## APPENDICES

### Appendix A

#### **Social Service Settings**

Juvenile justice settings include both correctional and probation. The correctional facility offers substance abuse and mental health counseling, life skills training, and academic support. Youth are placed in the facility by court order for crimes and delinquency, and are mandated to receive rehabilitation within confined setting. There are 28 youth who have been recruited from the correctional facility. The average age of youth at the facility is 16-years-old, and the racial/ethnic composition of is 29% Non-Hispanic White, 29% Black, 29% Hispanic, 7% Asian American, and 6% unknown. Youth on Juvenile Probation generally receive substance abuse and mental health counseling, life skills and career training, offender counseling (to address gangs, sex offenses, and other delinquent behavior), and academic support. Youth who are placed on probation have been sentenced by a judge after they have been adjudicated in court and are mandated to receive rehabilitation in the community. There are 10 youth who have been recruited from probation. The average age of adolescent probationers is 16-years-old, and the racial/ethnic composition is 45% Non-Hispanic White, 25% Black, 20% Hispanic, and 10% unknown. Both juvenile justice agencies consist of adolescents who primarily live in lower income households.

Youth from the community mental health outpatient setting have a variety of services available to them including family support, child welfare, housing and transitional support, mental health and substance abuse counseling, academic support, and career training for lower income youth. These youth are referred by the

Department of Children, Youth, and Families (DCYF), Department of Human Services, local high schools, or are self-referred. There are 11 youth who have been recruited from this setting. Generally, youth range in age from 14 to 20 years old, derive primarily from lower income households, and their racial/ethnic composition is 40% Non-Hispanic White, 40% Hispanic, 10% Black, and 10% Asian American.

Two alternative schools also serve as recruitment sites. These alternative schools were designed to accommodate educational, behavioral, or medical needs of children that cannot be adequately met in a traditional school environment. One provides life skills training, academic support, and career development to youth referred from DCYF, courts, self-enrollment, high school guidance counselors, therapists, and other social service programs. Forty-two youth, have been recruited from this setting. Typically youth from this setting range in age from 16-25 years old, and are comprised of the following racial/ethnic groups: 40% Non-Hispanic White, 20% Hispanic, 20% Black, 3% Asian American, 14% other, and 3% unknown. The other alternative school offers life skills training, mental health and academic support, and career development. Youth are referred from a variety of sources, including self-referral, referral from justice agencies, DCYF referral, and local middle school counselors. Enrollment is based on lottery after submitting an application. Ultimately, 47 participants have been recruited from this setting. Youth at this school range in age from 16-18 years old. The racial/ethnic composition is 42% Hispanic, 27% Black, 27% Non-Hispanic White, and 4% other. Youth from the alternative schools derive primarily from lower income households, and arrive at this setting after repeated difficulty in public schools, and for behavioral difficulty.

The residential social service settings include four agencies. The first provides substance abuse and mental health counseling, life skills and career training, violence and pregnancy prevention activities, and academic support. Youth in this program are referred from the child welfare, mental health, juvenile justice, and educational systems. Two participants have been recruited from this program. Youth in this program range between the ages of 13-18 years, and the racial/ethnic composition is 60% Hispanic, 25% Non-Hispanic White, and 15% Black. The second agency offers substance abuse and mental health counseling, life skills training, career development, and academic support, and youth are generally referred through insurance or other social service agencies. There are 13 participants who have been recruited from this agency. Youth from this agency generally range between the ages of 16-20 years, and the racial/ethnic composition is 36% Black, 28% Non-Hispanic White, 20% Hispanic, 4% Asian American, and 12% unknown.

The third and fourth residential agencies both offer substance and mental health counseling, life skills training and medication evaluation and monitoring. There are nine adolescents from the third agency and 17 adolescents from the fourth. The youth from both services range between the ages of 13-17. The racial/ethnic composition at the third agency is 44% Hispanic, 34% Non-Hispanic White, and 22% Black. The racial/ethnic composition at the fourth residential agency is 38% Hispanic, 37% Non-Hispanic White, and 25% Black. Youth from these residential programs derive primarily from lower income households and are referred from DCYF for a variety of reasons (child abuse/neglect; family disruption due to parental drug problem or incarceration, for example; child conduct disorder; etc.).

The residential social service agencies were combined into one group due to similar characteristics (i.e., services provided, age range, and racial/ethnic makeup) within each site and the small number of participants recruited from some of these agencies. The juvenile justice agencies were also combined due to similar characteristics (i.e. services provided, source of referral, age range, and racial/ethnic makeup) and the small number of participants recruited from probation. In addition, alternative schools were combined into one group due to similar characteristics (i.e., services provided and age range).

Table 1

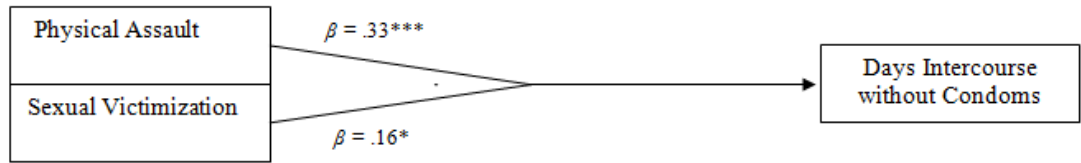
*Correlations, means, and standard deviations of predictor and outcome variables*

Variable	Mean	SD	1	2	3	4	5	6	7
1. Physical Assault	.11	.27	-						
2. Sexual Vic.	.10	.24	.46**	-					
3. Dep. Symptoms	12.67	6.01	.20**	.18*	-				
4. PTSD Symptoms	17.45	6.58	.16*	.15*	.48***	-			
5. Alcohol Use	.81	.72	.08	-.06	.07	.11	-		
6. Marijuana Use	5.85	6.53	.14	.09	.11	.16*	.49***	-	
7. Days No Condom Use	2.32	2.82	.35***	.31***	.08	-.06	.00	.16*	-

*Note:* \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Means, SDs, and Correlations were conducted with transformed variables. SD = Standard Deviation, Vic. = Victimization, Dep. = Depressive, PTSD = Post Traumatic Stress Disorder.

Figure 1.

*Multiple Regression Predicting Number of Days of Sexual Intercourse without a Condom from Physical Assault and Sexual Victimization*

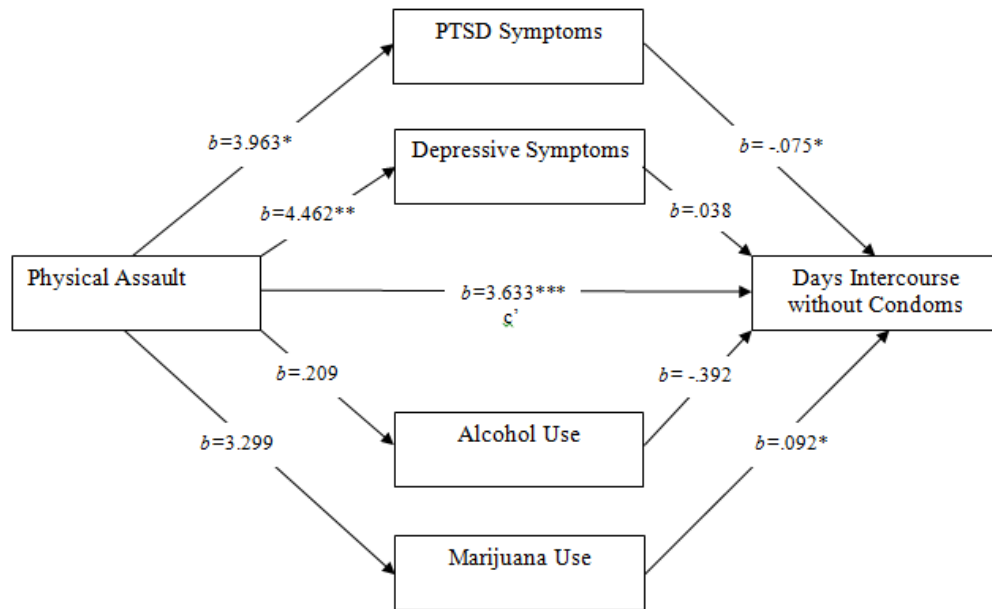


Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



Figure 2.

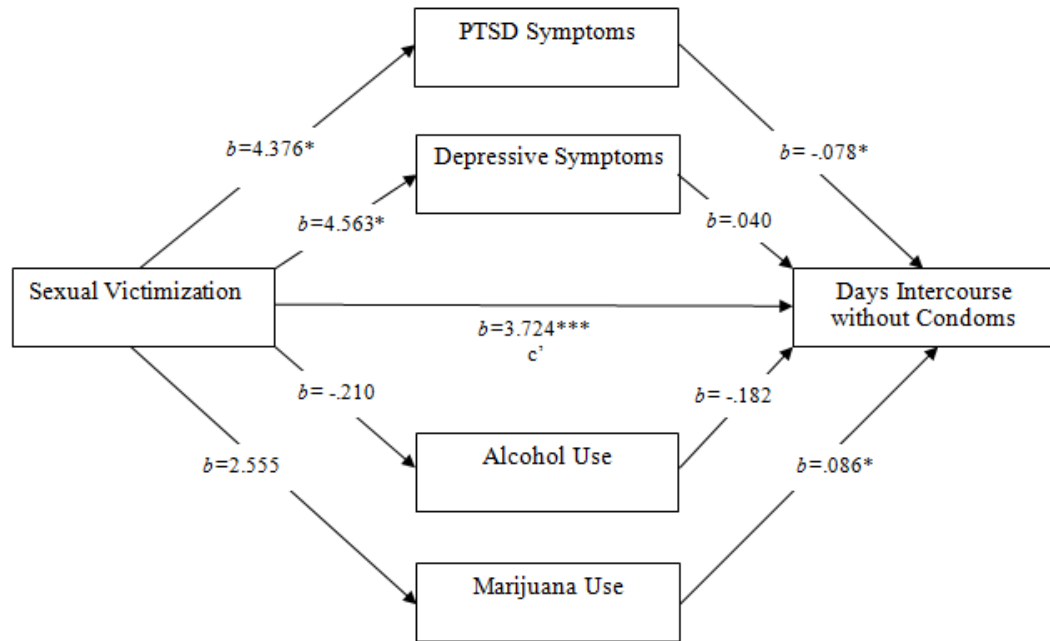
*Direct Effect of Individual Mediators and Direct Effect of Physical Assault.*



Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . The direct effect,  $c'$ , represents the relationship between physical aggression and days of intercourse without condoms after accounting for the effects of the mediators. Unstandardized paths,  $b$ , shown.

Figure 3

*Direct Effect of Individual Mediators and Direct Effect of Sexual Victimization.*



Note:  $*p < .05$ ,  $**p < .01$ ,  $***p < .001$ . The direct effect,  $c'$ , represents the relationship between sexual victimization and days of intercourse without condoms after accounting for the effects of the mediators. Unstandardized paths,  $b$ , shown.

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