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INTRA- AND INTER-PERSONAL PREDICTORS OF POSTTRAUMATIC STRESS  
DISORDER AND SEXUAL RISK-TAKING BEHAVIORS

BY

SEIGIE KENNEDY

BA, University at Albany, State University of New York, 2014

THESIS

Accepted in partial fulfillment of the requirements for  
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in the Graduate School of  
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## Abstract

Sexual risk-taking, while common in college culture, can increase the risk of sexual victimization. Nearly 20% of college women have been sexually assaulted (Krebs et al., 2009). Moreover, Posttraumatic Stress Disorder (PTSD) has been associated with sexual risk-taking (Johnson & Johnson, 2013). Self-esteem and social support are known to be related to PTSD and sexual risk-taking (Gullette & Lyons, 2006; Johnson & Johnson, 2013). This study aims to examine sexual victimization history, self-esteem, and social support as relative predictors of PTSD and sexual risk-taking using a sample of 229 female undergraduates. Results suggest that enhancing self-esteem, as opposed to bolstering social support, may have a greater relative impact on PTSD symptoms even after accounting for the impact of sexual victimization history. Moreover, the reduction of PTSD symptoms may have the potential to minimize sexual risk-taking behavior; however, future research is needed to determine temporal relations between these variables.

*Keywords:* Sexual assault, sexual risk-taking, posttraumatic stress, social support, self-esteem

## Table of Contents

List of Tables .....	vi
Introduction .....	1
Sexual Risk-Taking Behavior Among College Students .....	2
Sexual Victimization Among College Students.....	3
Posttraumatic Stress Disorder, Sexual Victimization, and Sexual Risk-Taking .....	4
Influence of Self-Esteem on Sexual Risk-Taking and PTSD .....	5
Influence of Social Support on Sexual Risk-Taking and PTSD .....	6
The Current Investigation .....	7
Methods .....	7
Participants .....	7
Measures .....	9
Procedure .....	11
Data Analytic Strategy .....	11
Results .....	12
Discussion .....	15
Tables .....	23
References .....	28

## List of Tables

Table 1: Demographics .....	23
Table 2: Correlations Among Sexual Risk-Taking, Self-Esteem, Perceived Social Support, and PTSD Symptom Severity .....	24
Table 3: Predictors of PTSD Symptom Severity and Sexual Risk-Taking Behavior .....	25
Table 4: Post Hoc Linear Regression Analyses Examining Sources of Social Support as Predictors of PTSD Symptoms Severity and Sexual Risk-Taking Behavior .....	26
Table 5: Post Hoc Binary Logistic Regression Analyses Examining Predictors of PTSD Diagnosis .....	27

## **Intra- and Inter-Personal Predictors of Posttraumatic Stress Disorder and Sexual Risk-Taking Behaviors**

The expression of sexuality and engagement in consensual sexual activity can be a positive and healthy experience. However, when sexual activity involves unprotected casual sex with multiple unfamiliar partners, or the influence of drugs or alcohol, then the sexual activity can be considered risky (Buttmann, Nielsen, Munk, Liaw, & Kjaer, 2011). Sexual risk-taking behavior can lead to contraction and transmission of sexually transmitted diseases, human immunodeficiency virus (HIV), and unwanted pregnancy (Center for Disease Control and Prevention (CDC), 2014; CDC, 2016a; Martin et al., 2017a). Despite an abundance of research illuminating the negative consequences of sexual risk-taking behavior in the young adult population and numerous intervention methods, college students continue to participate in risk-taking behavior, with some studies reporting that more than 50% of college students participate in sexual risk-taking behavior (Bearak, 2014; Grello, Welsh, & Harper, 2006; Laisaar, Raag, Rosenthal, & Uusküla, 2015; Owen & Fincham, 2011). Students who have experienced a sexual trauma and who have Posttraumatic Stress Disorder (PTSD) may be especially susceptible to engaging in risk-taking behavior. Research has found that PTSD symptoms and a history of sexual victimization has been associated with increased sexual risk-taking behaviors and alcohol use among college students (Gilmore, Lewis, & George, 2015; Johnson & Johnson, 2013; Lang et al., 2003; Schaumberg et al., 2015). College women in particular are an important subset to study as woman (as opposed to men) are more susceptible to STIs (Oldson, 2013) and college woman are at high risk of sexual



assault (Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, 2014).

### **Sexual Risk-Taking Behavior Among College Students**

Hook-up culture is prevalent (between 60-80%; Garcia, Reiber, Massey, & Merriwether, 2012) in the college and university setting and is a form sexual risk-taking behavior (Garcia et al., 2012; Turchik & Garske, 2008). The term “hooking-up” describes a sexual activity performed with an uncommitted partner. Hook-ups typically encompass a range of sexually intimate behaviors including kissing, oral sex, intercourse, etc. The sexual atmosphere among college-aged individuals often involves hooking-up with an attractive or convenient uncommitted partner who can be easily found via a mobile app. When hook-ups involve infrequent condom use, engaging in sexual acts with multiple partners, or engaging in sexual activity (including penetration) while under the influence of drugs or alcohol, the hook-up is considered sexual risk-taking behavior (CDC, 2016b; Garcia et al., 2012).

Consequences of sexual risk-taking behavior include the contraction of sexually transmitted infections (e.g., HIV), and unwanted pregnancy (CDC, 2016a). Sexual risk-taking behavior has been predominantly studied in young adults under the age of 24 years. This age group is of particular concern because approximately 22% of all new HIV diagnoses occurred in young people between the ages of 13 and 24 in a single year in the United States alone (CDC, 2015; CDC, 2016a). The high prevalence and acceptance of hook-up culture in the college students makes them a high-risk population, yet students demonstrate low levels concern. Indeed, one study found in a sample of 71 college students (all of whom reported engaging in at least one hook-up activity), sexually

transmitted infections were not a concern for half (50%) the sample (Downing-Matibag & Geisinger, 2009). Moreover, in a study of 429 college students who reported having engaged in some form of intercourse (oral, anal, or vaginal), less than half (46.6%) of the students reported using a condom (Lewis et al., 2011).

### **Sexual Victimization Among College Students**

Sexual risk-taking behavior is associated with increased risk for sexual assault (Combs-Lane & Smith, 2002). The prevalence rate estimates of sexual victimization, especially for women, are alarming. One undergraduate study (Krebs et al., 2009) found that 19% of undergraduate women report being sexually assaulted and a more recent Campus Climate Survey revealed a cross-school average prevalence rate of 21% for college females (Krebs et al., 2016). Nationwide, approximately 1 in 5 women will experience a sexually violent assault, such as rape, in their lifetime (Black et al., 2011).

Some evidence suggests that there is a bidirectional relation between sexual victimization and sexual risk-taking behavior whereby sexual victimization can lead to increased sexual risk-taking behavior. Indeed, in a 2013 study of sexual victimization and risk-taking behavior in college females, there was a positive relation between severity of the sexual assault and sexual risk-taking behavior (Johnson & Johnson, 2013). History of childhood sexual abuse has also been shown to be related to increased sexual risk-taking behavior in adolescents and adulthood in both males and females (Homma, Wang, Saewyc, & Kishor, 2012; Roemmele & Messman-Moore, 2011). In studies on college males and females who had been sexually assaulted after the age of 16, sexual victimization was related to increased alcohol use and sexual risk-taking behavior in both the male and female samples (Turchik, 2012; Turchik & Hassija, 2014).

## **Posttraumatic Stress Disorder, Sexual Victimization, and Sexual Risk-Taking**

Approximately 50-90% of individuals in the population will experience a traumatic event in their lifetime (Kessler et al., 1995). PTSD has a lifetime prevalence rate of 6.8% (Kessler et al., 2005). Lifetime prevalence among woman specifically is 9.7% (Kessler et al., 2005). Of woman who have been sexually assaulted, 94% report experiencing PTSD symptoms during the first two weeks after the assault, and 30% report continuing to experience PTSD symptoms nine months after the assault (Rothbaum et al., 1992).

Reactions to sexual victimization vary depending on the individual. Some may become depressed or angry, while others may experience social or sexual problems, such as avoidance and withdrawal from sexual activity (World Health Organization Department of Gender and Women's Health & World Health Organization Department of Injuries and Violence Prevention, 2003). Still others may experience extreme shame or guilt, and some may turn to alcohol to help temporarily reduce assault-related symptoms (Kilpatrick, Edmunds, & Seymour, 1992). Nearly one in every three survivors of sexual assault will develop Posttraumatic Stress Disorder (PTSD) in their lifetime (Kilpatrick, 2000) and in most cases the symptoms of PTSD are unlikely to spontaneously remit (Morina, Wicherts, Lobbrecht, & Priebe, 2014).

Research on the relation between PTSD and sexual risk-taking behavior have been mixed. In a study of 179 young adult females, females with PTSD were less likely to participate in sexual risk-taking behavior (Hill, 2016). Yet, in a sample of veterans (approximately 95% male), those with higher self-reported PTSD symptoms reported engaging in more sexual risk-taking behavior (Strom et al., 2012). It may be that the type

of trauma experienced in combination with the manifestation of PTSD, or the apparent sex differences of the samples, might explain these conflicting results.

### **Influence of Self-Esteem on Sexual Risk-Taking and PTSD**

An additional contributing factor in the relation between sexual victimization and sexual risk-taking behavior is self-esteem. Wild, Flisher, Bhana, and Lombard (2004) conducted a study demonstrating how different facets of self-esteem relate to sexual risk-taking behavior in male and female high school students. Low self-esteem has been shown to be correlated with sexual risk-taking behaviors, such as multiple sexual partners and unprotected sex (Gullette & Lyons, 2006; Lejuez et al., 2004). However, findings on the relation between self-esteem and sexual risk-taking are once again mixed. High self-esteem in college men has also been shown to be correlated with sexual risk-taking behaviors, such as multiple partners (Walsh, 1991; Ebert & Mason, 1987). This may be attributable to gender differences, though in a study on hook-up behavior and self-esteem in undergraduate students, it was found that individuals who engaged in hook-up behaviors reported lower self-esteem with no gender differences (Paul, McManus, & Hayes, 2000).

Moreover, evidence suggests that there is also a link between trauma and self-esteem. This is supported by the findings of Shapiro and Schwarz (1997), who investigated the relation between date rape and sexual self-esteem, and found that women who had been raped reported lower sexual self-esteem (Shapiro & Schwarz, 1997). The results of this study were replicated in women with a history of childhood sexual abuse rather than date rape (Van Bruggen & Kadlec, 2006). Another study, which examined the relation between childhood sexual abuse, trauma-related symptoms, and self-esteem,

found that trauma-related symptoms from childhood sexual abuse were related to low self-esteem in college-age women (Silvern et al., 1995). These findings indicate that sexual trauma may lead to low self-esteem, and specifically sexual self-esteem, in survivors. Inferences from other literature may suggest that this relation may contribute to increased sexual risk-taking behavior.

### **Influence of Social Support on Sexual Risk-Taking and PTSD**

One of the most robust predictors of PTSD is social support (for a review see Ozer, Best, Lipsey, & Weiss, 2003). In studies on women who have been sexually assaulted, it was found that negative social reactions were one of the strongest correlates of PTSD (along with avoidance coping) when compared to severity of the assault and self-blame (Ullman, Townsend, Filipas, & Starzynski, 2007; Ullman & Filipas, 2001). Multiple studies on social support and PTSD symptomology have agreed that social support has been negatively associated with PTSD severity (Atkeson et al., 1982; Burgess & Holmstrom, 1979; Campbell, Dworkin, & Cabral, 2009; Frazier & Burnett, 1994; Frazier, Mortensen, & Steward, 2005; Gutner, Rizvi, Monson, & Resick, 2006; Meyer & Taylor, 1986; Thompson et al., 2000; Valentiner, Foa, Riggs & Gershuny, 1996).

Initial evidence would also suggest that social support weakens the relations between sexual trauma and sexual risk-taking behavior (Johnson & Johnson, 2013). In the study of sexual victimization and sexual risk-taking behavior, the positive relation between sexual trauma and sexual risk-taking behavior was weakened by high quality social support (Johnson & Johnson, 2013). Increased social support has also been linked to decreased sexual and alcohol related risk behavior in college students (Steers et al.,

1996). Therefore, it is believed that positive perceived social support is a protective factor against risk-taking behavior, such as sexual risk-taking behavior.

### **The Current Investigation**

The current investigation aims to extend our understanding of the established relation between sexual victimization, PTSD, and sexual risk-taking behavior in college students. The results are expected to replicate the relation between sexual victimization, PTSD, and sexual risk-taking behavior in college students and extend the literature by examining sexual victimization history, self-esteem, and social support as relative predictors of PTSD and sexual risk-taking behavior. In line with previous literature and based on the studies of sexual behavior after sexual victimization, it is hypothesized that sexual victimization history will be associated with greater PTSD symptom severity. It is expected that, due to the robustness of the relation between social support and PTSD in previous literature (Ozer, Best, Lipsey, & Weiss, 2003), social support will be more strongly associated with PTSD symptom severity compared to self-esteem. Following previous research findings, it is hypothesized that sexual victimization history and PTSD will be associated with sexual risk-taking behavior. It is also anticipated that self-esteem will be more strongly associated with sexual risk-taking behavior than social support, given the findings cited in the previous literature (Gullette & Lyons, 2006; Lejuez et al., 2004) and the relation between self-esteem and sexual victimization (Shapiro & Schwarz, 1997).

## **Methods**

### **Participants**

Students for this study were recruited from a public university in upstate New York. There was a total of 359 participants included in the investigation; however, 74 cases were deleted due to a lack of data (participants terminated participation after completing the demographic questionnaire at the beginning of the online survey). A majority of the sample ( $n = 235$ ) were recruited using the SONA System, a subject pool software system in which students participate in university studies in exchange for research credit. A smaller subset ( $n = 124$ ) of participants were also recruited using an announcement on the university's news source and were provided no incentive for their participation by the researchers. Moreover, because the news source is sent to faculty, staff, and students, there were some participants who were not in the target college population. Participants aged 25 years and older ( $n = 24$ , ages ranging from 25 to 64 years) were excluded from the analyses as the purpose of this study is to examine risk-taking behavior in the college-aged population, individuals over the age of 25 are not typically considered to be "college-aged". Additionally, because the risk for sexual assault is unequivocally greater for female students (Black et al., 2011), male students ( $n = 32$ ) were excluded from this study due to the low prevalence of assault ( $n = 1$ ). Due to the low prevalence of sexual victimization in men, recruitment efforts were narrowed during the data collection phase to target the recruitment of women. As a result, 229 college-aged ( $M\ age = 19.36, SD = 1.18$ ) female participants were used in the analyses for this study.

## Measures

**Demographics.** Participants were asked to report their age, gender identity, sex, race/ethnicity, year in college, enrollment status in college, employment status, sexual orientation, and relationship status.

**Sexual Risk Survey (SRS; Turchik & Garske, 2008).** The SRS is a 23-item survey measure used to gauge sexual risk-taking behavior. The questions from the original survey were intended to measure five core factors: sexual risk taking with uncommitted partners (Factor 1; example item: *How many people have you had sex with that you know but are not involved in any sort of relationship with (i.e., “friends with benefits”, “fuck buddies”)*), risky sexual acts (Factor 2; example item: *How many times have you or your partner used alcohol or drugs before or during sex?*), impulsive sexual behaviors (Factor 3; example item: *How many times have you had an unexpected and unanticipated sexual experience?*), intent to engage in risky sexual behaviors (Factor 4, example item: *How many times have you gone out to the bars/parties/social events with the intent of “hooking up” and engaged in sexual behavior but not having sex with someone?*), and risky anal sex acts (Factor 5; example item: *How many times have you had anal sex without a condom?*). For the purpose of the present study, the risky anal sex acts factor (three questions) was eliminated due to relatively low factor score on the original measure, Cronbach’s alpha .61 (Turchik & Garske, 2008). Scoring for this survey was based on the guidelines for a typical American college sample (Turchik, Walsh, & Marcus, 2015). Two-week test-retest reliability for this measure was high, .93 (Turchik & Garske, 2008). Internal consistency reliability in the current sample was .90.



**Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965).** The Rosenberg Self-Esteem Scale is a well-established and validated ten-item measure that assesses individuals' perceptions of their own self-worth (Rosenberg, 1965). Participants answer each question on a four-point Likert scale, selecting from four options from “*Strongly agree*” to “*Strongly disagree*”. The RSE has high internal consistency, with scores ranging from 0.77 to 0.88 (Rosenberg, 1965). Internal consistency reliability for the current sample was .91.

**Life Events Checklist (LEC-5; Weathers et al., 2013a).** The LEC-5 is a 17-item measure which lists different potentially traumatic events. Participants are asked to report if the event “*Happened to them*”, “*Witnessed the event*”, “*Learned about the event*”, the event was “*Part of their job*”, they are “*Not sure*”, or the event “*Does not apply*” to them. There is no formal scoring or psychometrics available for the LEC-5, as it is a face valid measure of the presence or absence of exposure to a potentially traumatic event (Gray, Litz, Hsu, & Lombardo, 2004). For the purpose of the current study, item number eight, “*Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)*”, was dichotomized based on participants’ response to reporting whether the event happened to them directly (coded 0 if the event did not happen to them directly; coded 1 if the event happened to them directly).

**PTSD Checklist (PCL-5; Weathers et al., 2013b).** The PCL-5 is a 20-item measure which assesses PTSD symptom severity based on the Diagnostic and Statistical Manual of Mental Disorders – 5 (DSM-5; American Psychological Association, 2013). Participants respond to questions based on a five-point Likert scale, with responses ranging from “*Not at all*” to “*Extremely*”. Scores on the PCL-5 represent total symptom

severity and can range from 0 to 80. Psychometrics for the PCL-5 were tested using a sample of college students who had been exposed trauma. Internal consistency reliability for a previous college-aged sample was .94 (Blevins et al., 2015). Internal consistency reliability for the current sample was .96.

**Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988).** The MSPSS is a 12-item measure used to assess perceived quality of social support. Participants are asked about the quality of social support they receive from their friends, family, and significant other. Responses are based on a seven-point Likert scale from “*very strongly disagree*” to “*very strongly agree*”. Internal reliability for Significant Other, Family, and Friends scales were .91, .87, and .85 respectively. The total measure reliability was .88. The test-retest reliability over a 2 to 3-month period for Significant Other, Family, and Friends were .72, .85, and .75, respectively and .85 for the whole measure. Internal consistency reliability for the current sample was .96.

### **Procedure**

This study was approved by the Internal Review Board at Binghamton University, State University of New York. Participants in this study were asked to complete all measures online using SurveyMonkey, an online survey program used for confidential and password-protected collection of data. Considering the sensitivity of the questions asked, using this online format provided additional anonymity for students compared to coming into the laboratory.

### **Data Analytic Strategy**

T-tests, ANOVAs, and correlational analyses were used, as appropriate, to examine demographic variables as potential covariates in their impact on central constructs of interest (i.e., sexual risk-taking, PTSD symptom severity, self-esteem, and social support). Linear regressions were used to test the main hypotheses of the study. Linear regressions are often used for causal and predictive analyses (Statistics Solutions, 2013). A linear regression was performed to test the strength of the relation between sexual assault and PTSD when accounting for self-esteem and social support, and to determine if PTSD, self-esteem, and social support predict sexual risk-taking. Following the aims of this study (and the potential bidirectional relation), PTSD symptom severity is used as both a predictor of risk-taking behavior, and as a dependent variable.

## **Results**

Descriptive analyses revealed that participants were predominately White (69.0%,  $n = 158$ ) and heterosexual (82.1%,  $n = 188$ ). Thirteen percent of the sample ( $n = 30$ ) reported a history of sexual assault, and 71.8% ( $n = 163$ ) reported having experienced at least one traumatic event in their lifetime. Table 1 shows the demographic characteristics of the sample. Skewness and kurtosis were examined to determine normal distributions of variables of interest. Using an absolute z-score of less than 3.29 for the medium sample size ( $50 < n < 300$ ), all variables of interest were considered relatively normally distributed (Kim, 2013).

Group differences among demographics and constructs of interest were assessed using ANOVAs and t-tests. There was a significant group difference demonstrated between relationship status and sexual risk-taking behavior,  $F(5, 209) = 2.41, p = .04$ . That is, those in relationships were reporting significantly more sexual risk-taking ( $M =$

20.51,  $SD = 13.51$ ) than those who were single ( $M = 15.47$ ,  $SD = 14.41$ ). No other group differences were found. Therefore, relationship status was controlled for in analyses examining sexual risk-taking as a dependent or outcome variable. All bivariate correlations were in the expected direction, ranging from  $-.31$  to  $.36$  (refer to Table 2). Using independent samples t-test, significant effects were found between sexual assault history and PTSD symptom severity ( $t(224) = -5.29$ ,  $p < .001$ ), as well as between sexual assault history and sexual risk-taking behavior ( $t(217) = -2.10$ ,  $p < .05$ ).

To test the first hypothesis, that sexual assault history and social support would be most strongly associated with PTSD symptom severity compared to self-esteem, a multiple linear regression was performed. Sexual assault history ( $\beta = .31$ ,  $p < .001$ ), and self-esteem ( $\beta = -.28$ ,  $p < .001$ ) were significant predictors whereas social support was not a significant predictor of PTSD symptom severity ( $\beta = -.03$ , n.s., ( $F(3, 222) = 18.10$ ,  $p < .05$ )). Together, sexual assault history and self-esteem explained 20% of the variance in PTSD symptom severity ( $R^2 = .20$ ).

To test the second hypothesis, that sexual assault history, PTSD symptom severity, and self-esteem would be more strongly associated with sexual risk-taking behavior compared to social support, a hierarchical linear regression was performed. Relationship status (dichotomized as 0 = single, 1 = in some form of a romantic relationship) was entered as a control variable in the first block. All other variables of interest were entered into the second block. Sexual assault history ( $\beta = .14$ ,  $p < .05$ ) and PTSD symptom severity ( $\beta = .18$ ,  $p < .05$ ) were the only significant predictors of sexual risk-taking behavior (self-esteem,  $\beta = .03$ , n.s.; social support,  $\beta = .05$ , n.s. ( $F(5, 206) =$

3.49,  $p \leq .05$ ) explaining 7% of the variance ( $R^2 = .07$ ). Table 3 reflects the findings from both linear regressions.

Based on the results from the primary analyses, post-hoc analyses were conducted to test sexual assault, self-esteem, and social support as relative predictors of probable PTSD diagnosis. To run this analysis, probable PTSD diagnosis was determined using a cut-score of 33 (Blevins et al., 2015; Bovin et al., 2015; Wortmann et al., 2016) from the summed scores of the PTSD Checklist (Weathers et al., 2013b). Using this cut-score, 25% ( $n = 56$ ) of the sample were in the probable PTSD diagnosis category. Similar to the PTSD severity results above, binary logistic regression analysis demonstrated that sexual assault (Wald = 16.06,  $p = .00$ , OR = 5.89 (95% CI = 2.47, 14.04) and self-esteem (Wald = 11.90,  $p = .00$ , OR = .90 (95% CI = .84, .95) were significant predictors of PTSD diagnosis (social support,  $B = -.02$ , S.E. = .01,  $p = .11$  n.s.). The next step was to examine if the source of social support (from family, friends, or significant other) differed in ability to predict PTSD symptom severity and PTSD diagnosis. Individual linear regressions were run for each source of social support. Results showed that social support from family ( $\beta = -.17$ ,  $p < .05$ ) is the only significant predictor of PTSD symptom severity (social support from friends,  $\beta = -.09$ ,  $p = .18$  n.s., ( $F(1, 227) = 1.80$ ,  $p = .18$ ); social support from significant other,  $\beta = -.06$ ,  $p = .41$  n.s., ( $F(1, 227) = .70$ ,  $p = .41$ )). Refer to Table 4 for the post hoc linear regression analyses. In predicting PTSD diagnosis, binary logistic regression revealed that perceived social support from family (Wald = 13.28,  $p = .00$ , OR = .92 (95% CI = .88, .96) and friends (Wald = 6.43,  $p = .01$ , OR = .94 (95% CI = .89, .99) were significant predictors ((social support from significant

other,  $B = -.04$ ,  $S.E. = .02$ ,  $p = .12$ , n.s.). Refer to Table 5 for the post hoc binary logistic regression results.

Finally, PTSD diagnosis and source of social support were tested as predictors of sexual risk-taking behavior, after accounting for relationship status. Using a hierarchical linear regression (relationship status in block one, PTSD diagnosis in block two), PTSD diagnosis was a significant predictor of sexual risk-taking behavior ( $\beta = .16$ ,  $p < .05$ ), accounting for 4% of the variance ( $R^2 = .04$ ). Neither social support from family, friends, nor significant other were significant in predicting sexual risk-taking behavior (social support from family,  $\beta = -.02$ ,  $p = .77$  n.s. ( $F(2, 212) = 1.81$ ,  $p < .05$ ), social support from friends,  $\beta = .11$ ,  $p = .11$  n.s. ( $F(2, 212) = 3.05$ ,  $p < .05$ ), social support from significant other,  $\beta = .04$ ,  $p = .58$  n.s. ( $F(2, 212) = 1.93$ ,  $p < .05$ )).

## Discussion

The purpose of this study was to examine relative predictors (namely perceived quality of social support and self-esteem) of PTSD symptom severity and sexual risk-taking among college women. Previous literature has established a link between sexual assault, PTSD, and sexual risk-taking behavior (Strom et al., 2012; Turchik, 2012), but to the best of our knowledge, no study has examined the influence of self-esteem and social support in the same model amongst sexual assault when predicting PTSD symptom severity and sexual risk-taking behavior in a college sample. Understanding the role of potentially modifiable predictors such as self-esteem and social support on the relation between sexual assault, PTSD, and sexual risk-taking, may better inform clinicians in the

development of effective interventions for decreasing PTSD symptom severity and sexual risk-taking behavior in college students following a sexual assault.

Individuals in relationships reported engaging in more risk-taking behavior than their single counterparts in the current sample. This may be explained by the greater frequency of sexual intercourse between committed partners due to access and convenience. For instance, responses to questions such as: “How many times have you had vaginal intercourse without a latex or polyurethane condom” or “How many times have you given or received fellatio (oral sex on a man) without a condom” (Turchik & Garske, 2008), may inflate the total score for sexual risk-taking behavior and may not truly reflect risk-taking behavior (i.e., if a participant is in a committed monogamous relationship in which both partners have tested negative or have been treated for an STI, they may opt out of using condoms or dental dams as there is a low risk for contracting an STI and they may be using other means of protecting against pregnancy, such as an oral contraceptive or Intra-Uterine Device). Moreover, it has been found that rates of condom use decrease as commitment level in a romantic relationship increases (Martin et al., 2017b), perhaps in part to establish and increase trust and intimacy (Corbett, Dickson-Gómez, Hilario, & Weeks, 2009). Despite the impact of relationship status on sexual behaviors, sexual assault history and PTSD symptom severity could account for unique variance in sexual risk-taking behavior, above and beyond what is accounted for by relationship status.

As expected, there was a significant small-medium sized positive correlation between PTSD symptom severity and sexual risk-taking in the current college sample. Based on findings from previous literature (Hill, 2016; Strom et al., 2012), the direction

and intensity of the relation between PTSD and sexual risk-taking has varied. However, since college students are prone to partake in increased rates of sexual risk-taking behavior (Garcia et al., 2012; Turchik & Garske, 2008), it could be expected that the severity of PTSD could act as a catalyst for this relation, increasing the rate of an already established behavior.

The significant negative correlation between PTSD symptom severity and self-esteem replicated previous findings by Silvern and colleagues (1995). It has been posited that this association is due to the difficulty in coping with PTSD and feelings of self-blame, and other disorders linked to PTSD, such as depression (Tull, 2017). The insignificant correlation between PTSD symptom severity and perceived social support, however, was unexpected. Previous studies have found social support to be a robust predictor of PTSD, but regression analyses based on the current data did not find that to be the case for all forms of social support.

Contrary to previous literature (Atkeson et al., 1982; Burgess & Holmstrom, 1979; Campbell, Dworkin, & Cabral, 2009; Frazier & Burnett, 1994; Frazier, Mortensen, & Steward, 2005; Gutner, Rizvi, Monson, & Resick, 2006; Meyer & Taylor, 1986; Thompson et al., 2000; Valentiner, Foa, Riggs & Gershuny, 1996) and to what was hypothesized, the first multiple linear regression found that perceived social support was not significantly associated with PTSD symptom severity. In fact, self-esteem (and sexual assault history, as expected) was found to be significantly associated with PTSD symptom severity. This may suggest that self-esteem should be a key factor to focus on for PTSD symptom reduction in young adult women with a history of sexual assault. However, when social support was deconstructed into subscales of perceived quality



support from significant other, family, and friends, those results revealed that perceived social support from family was associated with PTSD symptom severity and probable PTSD diagnosis, with greater social support from family indicating a decreased likelihood for meeting PTSD diagnostic criteria. This indicates that familial social support may be the most crucial source of social support in cases where PTSD symptom severity is the most intense (above a cut-score of 33 on the PCL-5) (Blevins et al., 2015; Bovin et al., 2015; Weathers et al., 2013b; Wortmann et al., 2016). Results also suggest a relation between low familial social support, poor self-esteem, and PTSD symptom severity in young women, yet causal relations cannot be determined given the cross-sectional nature of the current study. While it is important to note that social support can, at times, have negative consequences, such as significant others enabling their partner to engage in avoidance of trauma related stimuli (Remer & Ferguson, 1996), results in this study indicate that social support from family may act as a buffer to help prevent PTSD symptoms from potentially meeting diagnostic criteria. Moreover, results of this study suggest that support from friends and family may help to prevent the development of a potential PTSD diagnosis.

As predicted, sexual risk-taking behavior was directly correlated to sexual assault history. This is supported by the findings of Johnson and Johnson (2013), who indeed found there to be a positive correlation. Among the variables hypothesized to be associated with sexual risk-taking behavior (i.e., self-esteem, social support, sexual assault history, and PTSD symptom severity and diagnosis), sexual assault and PTSD symptom severity (as well as PTSD diagnosis) were found to be significantly associated with sexual risk-taking behavior. Self-esteem and social support was not associated with

risk-taking above and beyond what was accounted for by sexual assault history and PTSD symptom severity. However, previous literature by Johnson and Johnson (2013) indicated social support as a moderator of the relation between sexual assault and sexual risk-taking behavior, and other studies have indicated self-esteem to be relevant to sexual risk-taking behavior (Ebert & Mason, 1987; Paul, McManus, & Hayes, 2000; Walsh, 1991). Though it is important to note that these studies did not include a measure of PTSD symptoms.

This study, like many others in this field, had its own set of limitations. To start, this study relied solely on the use of self-report measures for data collection. While the use of online self-report measures allows for a greater sense of anonymity among participants, which may allow for more truthful responses, it also limits the information that can be collected to subjective self-perceptions, which may or may not be accurate representations of the individual and his/her behavior. It is suggested that future research collect data in a two-step process. It may be advantageous to have participants complete online self-report measures from a remote location to increase a sense of anonymity, and to then invite participants into the lab setting for objective, behavioral, and physiological data collection. Another option may be to ask informants who know the participants well to complete measures based on their perception of the participants, and compare and contrast the responses.

To address the concern that some participants may not fully or truthfully disclose the extent of their sexually risky behaviors, this study was conducted online so that participants could feel free to provide their answers in a format that provides greater anonymity and in a comfortable setting of their own choosing. Furthermore, in the

development of the Sexual Risk Survey, Turchik and Garske (2008) tested the correlations between self-reported sexual risk-taking, social desirability, and threat of disclosure and determined that college students' scores on the Sexual Risk Survey were not reflective of impression management, self-deception, or feelings of threat from disclosure. The mean rate of sexual risk-taking behavior for the current sample ( $M = 17.89$ ,  $SD = 14.20$ ) is commensurate (only slightly higher) with what has been reported by previous research ( $M = 15.63$ ,  $SD = 11.29$  in female sample; Turchik & Garske, 2008;  $M = 16.30$ ,  $SD = 13.02$ , in male and female sample; Hahn, Simons, & Simons, 2016), and still within one standard deviation. Therefore, we are comfortable in the accuracy of the results reported by participants in the current sample.

Though relationship status was assessed using a single multiple-choice item response, not enough information was gathered on the depth of the individual's relationship to form meaningful interpretations of how relationship status affects sexual behaviors. For instance, participants were not questioned about the length of their relationship or about incidence of infidelity. These questions are particularly salient in making assumptions about the association between relationship status and sexual behavior, as the Sexual Risk Survey specifically asks participants to respond based on their behaviors over the past 6 months. Individuals new to a relationship, or who engage in infidelity may not be basing their answers solely on the sexual behaviors they share with their significant other. It is suggested that future research in this area take a more investigative look into the constructs of individuals' sexually intimate relationships and how those relationships affect sexual behavior versus risky sexual behavior.

A final limitation of this study is its inability to determine a baseline level of sexual risk-taking behavior pre-trauma. It is highly encouraged that future studies utilize

a longitudinal design to disentangle the influence of PTSD symptom severity and other variables on the trajectory of sexual risk-taking behavior over time. By tracking these constructs across time-points, researchers will be able to truly identify the direction of the relation between self-esteem, social support, PTSD, and sexual risk-taking behavior following sexual assault. Future studies may choose to explore additional potentially relevant constructs such as depression, anxiety, self-efficacy, and sensation-seeking.

In conclusion, the results of the current study showed that strong familial social support may help to reduce the likelihood of PTSD symptoms after sexual assault. Moreover, survivors that demonstrate higher PTSD symptom severity also have lower self-esteem. Therefore, it may be useful for clinicians to focus on building interventions for PTSD which target self-esteem building techniques, along with perhaps integrating elements of family therapy, to strengthen familial support structures for college women. Relationship status was found to play a role in influencing sexual behaviors, however once accounted for, results showed that women with higher PTSD symptom severity are more likely to engage in sexual risk-taking behavior.

Current findings and previous research also indicate that survivors of sexual assault are at risk for engaging in sexual risk-taking behaviors. Thus, even though self-esteem was not directly correlated to sexual risk-taking behavior, survivors of sexual assault who engage in increased sexual risk-taking behavior, especially for those who display increased PTSD symptom severity, may benefit from interventions which focus on building and strengthening self-esteem and familial relations to decrease PTSD symptoms, and thereby, decrease sexual risk-taking behavior. However, before definitive

conclusions and inferences can be made, more research is needed to replicate results and determine temporal precedence of the constructs of interest of the outcome variables.

## Tables

Table 1

*Demographics*

		%
Race/Ethnicity	White	69.0
	African American	3.1
	Hispanic or Latino	7.0
	Asian	11.4
	Other	0.8
	Multiracial	8.7
Year in College	Freshman	32.2
	Sophomore	45.8
	Junior	14.1
	Senior	5.7
	5 <sup>th</sup> Year	2.2
Enrollment in School	Full time	98.47
	Part time	1.3
Employment	Full time	2.6
	Part time	28.8
	Not employed	68.6
Sexual Orientation	Asexual	2.6
	Heterosexual	82.1
	Homosexual	3.5
	Bisexual	10.0
	Other	1.8
Relationship Status	Single	51.5
	Casually Dating	10.0
	Monogamous Relationship	36.2
	Engaged	.9
	Open Relationship	.9
	Married	.4

Table 2

*Correlations Among Sexual Risk-Taking, Self-Esteem, Perceived Social Support, and PTSD Symptom Severity*

	M (SD)	1	2	3	4
1. Sexual Risk-Taking Total	17.89 (14.2)	1.00			
2. Self Esteem	17.64 (5.76)	-.01	1.00		
3. PTSD Symptom Severity	20.88 (18.44)	.22**	-.31**	1.00	
4. Perceived Social Support	64.01 (18.47)	.06	.36**	-.12	1.00

*Note.* \*\* Correlation is significant at the 0.01 level (2-tailed).

Table 3

*Predictors of PTSD Symptom Severity and Sexual Risk-Taking Behavior*

<b>Criterion Variable</b>	<b>Predictors</b>	<b>B</b>	<b>SE B</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
PTSD Symptom Severity	History of Sexual Assault	16.80	3.28	.31	5.12	.00
	Self-Esteem	-.90	.21	-.28	-4.34	.00
	Quality of Social Support	-.04	.07	-.03	-.51	.61
Sexual Risk-Taking Behavior	Relationship Status	1.26	.93	.09	1.36	.18
	History of Sexual Assault	6.06	3.00	.16	2.02	.05
	PTSD Symptom Severity	.14	.06	.19	2.46	.02
	Self-Esteem	.08	.18	.03	.41	.68
	Quality of Social Support	.05	.06	.06	.83	.41



Table 4

*Post Hoc Linear Regression Analyses Examining Sources of Social Support as Predictors of PTSD Symptoms Severity and Sexual Risk-Taking Behavior*

<b>Criterion Variable</b>	<b>Predictors</b>	<b>B</b>	<b>SE B</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
PTSD Symptom Severity	Social Support from Significant Other	-.14	.17	-.06	-.83	.41
	Social Support from Family	-.43	.17	-.17	-2.56	.01
	Social Support from Friends	-.25	.18	-.09	-1.34	.18
Sexual Risk-Taking Behavior	Relationship Status	1.56	.94	.11	1.66	.10
	Probable PTSD Diagnosis	5.14	2.22	.16	2.32	.02
	Relationship Status	1.60	.98	.12	1.62	.11
	Social Support from Significant Other	.08	.14	.04	.56	.08
	Relationship Status	1.75	.94	.13	1.87	.06
	Social Support from Family	-.04	.14	-.02	-.28	.77
	Relationship Status	1.69	.93	.12	1.81	.07
	Social Support from Friends	.24	.15	.11	1.59	.11

Table 5

*Post Hoc Binary Logistic Regression Analyses Examining Predictors of Probable PTSD Diagnosis*

<b>Criterion Variable</b>	<b>Predictors</b>	<b>B</b>	<b>SE B</b>	<b>Wald</b>	<b>Sig.</b>	<b>Exp(B)</b>
Probable PTSD Diagnosis	History of Sexual Assault	-1.77	.44	16.03	.00	5.89
	Self-Esteem	-.11	.03	11.90	.00	.90
	Quality of Social Support	-.02	.01	2.57	.12	.98
	Social Support from Significant Other	-.04	.02	2.60	.11	.97
	Social Support from Family	-.08	.02	13.28	.00	.92
	Social Support from Friends	-.06	.03	6.43	.01	.94

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