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Sexual Assault, Post-Traumatic Stress Disorder Symptoms, and Sexual Functioning in Young Adult Women

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Sexual Assault, Post-Traumatic Stress Disorder Symptoms, and Sexual Functioning in Young
Adult Women

Sanne N. Wortel, Ph.D.

University of Connecticut, 2020

Individuals with a history of sexual assault often experience subsequent sexual dysfunction. Recent theories posit that Post-Traumatic Stress Disorder (PTSD) symptoms mediate this relationship; however, much of the literature is based on military samples. Young adult women in the years of emerging and early adulthood (i.e., 18-25) have higher rates of sexual assault compared to other age groups, yet the implications of sexual assault on their sexual functioning has rarely been evaluated. The purpose of this project was to test associations between sexual assault, PTSD, and sexual functioning in two samples of young adult women: one college sample of 230 students and one community sample of 38 low-income women of the same age. Participants reported on unwanted sexual experiences, PTSD symptoms, and sexual functioning, and the university sample also reported on sexual functioning one month later. Sexual functioning was operationalized based on DSM-5 models of sexual dysfunction (desire, arousal, orgasm, pain) and attachment theory models of sexual behavioral systems (sexual system hyperactivation and deactivation). Once past vaginal intercourse was controlled for, young women with a sexual assault history generally did not report worse sexual functioning in the arousal, orgasm or pain domains in either sample. In the university sample, sexual assault history was associated with greater sexual desire and a hyperactive sexual system (e.g., preoccupation about sexual inadequacy), with PTSD symptoms potentially mediating this link. PTSD symptoms were also predictive of worse sexual functioning over time. In general, PTSD symptoms were more strongly related to concurrent sexual functioning in the community sample

compared to the college sample. There was no evidence that specific domains of PTSD were particularly relevant to sexual functioning. Results from this study highlight one mechanism that may contribute to re-victimization in young women with a sexual assault history, and emphasize the need for sexual functioning measures and clinical interventions that are adapted to the sexual difficulties of young adult women.

Sexual Assault, Post-Traumatic Stress Disorder Symptoms, and Sexual Functioning in Young
Adult Women

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A Dissertation

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at the

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2020

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APPROVAL PAGE

Doctor of Philosophy Dissertation

Sexual Assault, Post-Traumatic Stress Disorder Symptoms, and Sexual Functioning in Young
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Introduction

Individuals with a history of sexual assault often experience subsequent sexual dysfunction (Messman-Moore, Brown, & Koelsch, 2005; Postma, Bicanic, van der Vaart, & Laan, 2013; Turchik & Hassija, 2014). Literature on the relation between sexual dysfunction and post-traumatic stress disorder (PTSD) suggests that PTSD symptoms may be one cause of sexual dysfunction for trauma survivors (Yehuda, Lehrner, & Rosenbaum, 2015). Individuals with PTSD experience symptoms of increased arousal, intrusion, avoidance, and negative changes in their cognitions or mood, after directly or indirectly experiencing a traumatic event (American Psychiatric Association, 2013). In a recent review, Yehuda and colleagues (2015) proposed a model delineating different psychological and biological processes in PTSD that may contribute to sexual dysfunction. Although aspects of her model have empirical support, much of this literature was conducted on men in the military (Cosgrove, Gordon, Bernie, Hami, Montoya, Stein, & Monga, 2002; Helmer, Beaulieu, Houlette, Latini, Goltz, Etienne, & Kauth, 2013; Hirsch, 2009). The focus on men is somewhat surprising given higher rates of PTSD among women than men (Jin, Xu, & Liu, 2014; Tolin & Breslau, 2007), and likely reflects the tendency for research on PTSD to focus on veteran populations even though women with a sexual assault history are an especially vulnerable population in terms of developing PTSD (Campbell, Dworkin, & Cabral, 2009). Research examining relations between PTSD and sexual dysfunction in women has also disproportionately focused on women in the military (Cohen, Maguen, Bertenthal, Shi, Jacoby, & Seal, 2012), who may be distinct in important ways from other groups of potentially vulnerable women, such as college students. One group at potentially heightened risk is young women in the years of emerging and early adulthood (i.e., 18-25). Compared to other age groups, young adult women have higher rates of sexual assault

victimizations (Sinozich & Langton, 2014). There are also developmental differences in normative sexual behaviors and functioning at this age (Halpern, Waller, Spriggs, & Hallfors, 2006; Kar, Choudhury, & Singh, 2015) which may have implications for how assault experiences or trauma impact sexual functioning. The purpose of this project was to test whether the association between sexual assault, PTSD, and sexual functioning is evident within two samples of young adult women drawing from the mediational model proposed by Yehuda and colleagues (2015). Furthermore, this project evaluated whether certain types of trauma symptoms are particularly related to specific types of sexual dysfunction in the years of emerging adulthood (see Figure 1).

Background

Sexual assault is strikingly common among young adult women. Women between 18 and 24 years old have the highest rates of sexual assault victimizations and rapes, compared with other ages groups (Sinozich & Langton, 2014). In large surveys of female university students, approximately 20-27% report experiencing an attempted or completed sexual assault (Carey, Durney, Shepardson & Carey, 2015; Conley, Overstreet, Hawn, Kendler, Dick, & Amstadter, 2017), although rates over 70% have been reported when broader definitions of assault are used (Turchik & Hassija, 2014). Although rates vary based on the type of sample and definition used, sexual assault is clearly a widespread phenomenon facing young women.

Definitions of sexual assault contribute largely to differences in the prevalence estimates. Operational definitions of sexual assault have varied considerably over time, with a large focus on rape: unwanted (completed or attempted) vaginal, oral, or anal penetration by way of physical force or alcohol or drug-facilitated penetration (Black et al., 2011; Thomas, Scott Tilley, & Esquibel, 2015). A large number of terms for unwanted sexual experiences are used in research

today, such as acquaintance rape (perpetrated by an acquaintance of the victim), date rape, sexual violence, coercion (pressure through nonphysical means), or unwanted sexual contact (unwanted sexual experience that involved touch, but not penetration). Although these many terms help us capture more specific forms of unwanted sexual experiences, many studies either use terms interchangeably or rely on broader terms (e.g., unwanted sexual experiences). This project used the term sexual assault to include all unwanted sexual experiences mentioned above.

Sexual assault has a significant impact on individuals and society. Women who experience sexual assault have poorer physical health, more psychological problems, and more relational and employment problems (Campbell et al., 2009; Davis, Petretic-Jackson, & Ting, 2001; Leserman, 2005). Sexual assault also comes at considerable national cost. The medical, legal, and social services cost associated with rape is estimated to be 127 billion dollars a year (DeLisi, Kosloski, Sween, Hachmeister, Moore, & Drury, 2010). Sexual violence among adolescents and young adults is estimated to cost \$45 billion dollars a year (“Child Sexual Abuse Cost,” n.d.). Sexual assault is associated with worse job performance, lower educational attainment, and reduced income (Anda et al., 2004; MacMillan, 2000), all of which impact individual’s economic potential and have ramifications for society as a whole.

The deleterious consequences of sexual assault have been well documented; however, relatively few studies have focused specifically on the potential impact to women’s sexual functioning. The extent to which women who have experienced a sexual assault are able to experience and enjoy positive sexual experiences may be studied less often because it is deemed secondary to other types of assault consequences (e.g., physical injury) or because of implicit attitudes about women’s sexual enjoyment more generally (Baumeister & Twenge, 2002). Given that positive sexual functioning can contribute to better mental and physical health across the

lifespan (for review, see Diamond & Huebner, 2012), there is a need for more research on barriers to sexual well-being among young women. In particular, identifying if and how sexual assault is related to sexual dysfunction among young women can provide insight into potential mechanisms and targets for intervention. The current study addressed this gap in the literature drawing from Yehuda et al.'s (2015) proposed meditational model from sexual trauma to PTSD to sexual functioning. In the following sections, I will review literature on the relationships between a) sexual assault and sexual dysfunction, b) sexual assault and PTSD, and c) PTSD and sexual dysfunction.

Sexual Assault and Sexual Dysfunction

Female sexual dysfunctions are identified by a disruption in a women's ability to experience sexual pleasure or to respond sexually, while causing significant distress or relational difficulties (American Psychiatric Association, 2013). Sexual problems are often classified into difficulties with desire, arousal, orgasm, or sexual pain (American Psychiatric Association, 2013). Problems with sexual functioning are quite common among women (Brotto & Klein, 2010). In a large national probability sample of 1,749 American women over age 18, 43% of the women were found to experience some problems with sexual functioning (Laumann, Paik, & Rosen, 1999). Twenty-two percent reported low sexual desire, fourteen percent identified low arousal, and seven percent reported sexual pain (Laumann et al., 1999). This study found that the prevalence of sexual dysfunctions decreased with age for women, with the exception of trouble lubricating (Laumann et al., 1999). In contrast, other studies have found an increase in most sexual dysfunctions with age, however, some difficulties have been found to have a U-shaped association with age (Hendrickx, Gijs, & Enzlin, 2015). This same study evaluated the difference between sexual dysfunction and sexual distress, which was also significantly

associated with age, where sexual distress was more frequent among younger women (Hendrickx et al., 2015). It is unclear why this discrepancy in age exists; it is clear, however, that more research is needed to understand sexual dysfunction among women during emerging adulthood.

Individuals who have experienced sexual assault are more at risk for sexual dysfunction and poorer subjective physical health than those who have not (Sadler, Mengeling, Fraley, Torner, & Booth, 2012). Even a single sexual assault experience has been associated with pain during sex and problems with sexual functioning (Sadler et al., 2012). Recent literature on female veterans has helped evaluate some of these associations. One study of mostly African American veterans showed that sexual assault victims experienced more frequent gynecological health symptoms, when compared to non-assaulted veterans (Campbell, Lichty, Sturza, & Raja, 2006). Specifically, women with a sexual assault history experience problems with sufficient lubrication and pain during intercourse (Postma et al., 2013; Sadler et al., 2012). Another study of female veterans in the Midwest found that one third of participants used lubricants to make sex comfortable and one quarter of the participants endorsed painful intercourse (Sadler et al., 2012).

Adolescents and young adult women have also been found to struggle with problems of sexual functioning and health after sexual assault. Adolescent victims of rape were found to be 2.4 times more likely to report sexual dysfunction than individuals who were not victimized (Postma et al., 2013). A study conducted with college students indicated that women who experienced sexual victimization that was more severe, such as rape, were most likely to describe problems with sexual functioning (Turchik & Hassija, 2014). Adolescent rape victims were also 2.7 times more likely to report difficulties with vulvodynia, irritable bowel syndrome, and lower urinary tract problems, known as pelvic floor dysfunction (Postma et al., 2013). The age at

which a person experiences sexual assault may also play a role in the severity of their sexual problems. When comparing adult victimization (after age 17) to childhood sexual abuse (CSA), adult victimization was associated with more sexual dysfunction (Messman-Moore et al., 2005). Although research has documented the relationship between sexual assault and sexual dysfunction, it is less clear if sexual assault is related to distinct subtypes of sexual dysfunction. Given age differences in normative sexual functioning, the relationship between sexual assault and sexual dysfunction may differ for younger women.

Sexual Assault and PTSD

In order to meet diagnostic criteria for PTSD, according to the Diagnostic and Statistical Manual, fifth edition (DSM-5), individuals must have experienced, witnessed or heard about a traumatic event. The DSM-5 defines a traumatic event as being exposed to serious injury, threatened or actual death, or sexual violence (American Psychiatric Association, 2013). PTSD is made up of different symptom clusters: intrusion symptoms (i.e., flashbacks, nightmares); avoidance symptoms; changes in cognitions or mood (i.e., negative beliefs about oneself, guilt, shame or anger, or the loss of interest in things); and alterations in arousal (i.e., hypervigilance; American Psychiatric Association, 2013).

It has been extensively documented that women who experience sexual assault have worse mental health problems (for a review see, Campbell et al., 2009). Almost one-third of female rape victims experience PTSD (Kilpatrick, 2000). Sexual coercion, in the absence of rape, has also been found to be a predictor of PTSD (Norwood & Murphy, 2012). A number of sexual assault variables (i.e., past mental health symptoms, past victimization, injury or perceived life threat during the assault, post assault coping and social support) have been linked to the development of PTSD (Klump, 2006). Furthermore, the presence of PTSD after sexual

assault may specifically impact subsequent functioning and other mental health symptoms. For example, PTSD symptoms have been found to account for changes in symptoms of anxiety and depression in the four months after sexual assault (Nickerson et al., 2013).

Young adult women may be at particular risk when it comes to developing PTSD in response to sexual assault. Women who were victimized before age 18 were 3.8 times more likely to suffer from PTSD, while women victimized as adults were 2.9 times higher compared to women with no sexual assault history (Masho & Ahmed, 2007). Given that young adult women may be at heightened risk for PTSD as a result of sexual assault, it is important to evaluate the negative consequences of PTSD among this population.

PTSD and Sexual Dysfunction

Several studies have shown that PTSD is associated with sexual dysfunction (for a review, see Yehuda et al., 2015). Most of the studies have been conducted with men in the military (Cosgrove et al., 2002; Helmer et al., 2013; Hirsch, 2009), though the few available studies on female sexual dysfunction have similar findings (Letourneau, Resnick, Kilpatrick, Saunders, & Best, 1996). These studies found that sexual dysfunction is greater in individuals with PTSD than for those without PTSD, regardless of the type of trauma (Cosgrove et al., 2002; Letourneau et al., 1996).

The affective and cognitive processes involved in PTSD may impact sexual functioning (Yehuda et al., 2015). Individuals with PTSD may avoid activities, such as sexual activity, that lead to physiological arousal, due to the fear of triggering an intrusive memory or flashback (Nunnink, Goldwaser, Afari, Nievergelt, & Baker, 2010). Similarly, in order to achieve orgasm a certain amount of control needs to be relinquished. Individuals with PTSD may feel angry, scared, or helpless when they are unable to relinquish that control, pairing the negative affect

with the sexual activity (Yehuda et al., 2015). The numbing and disconnection present in PTSD would also inhibit feelings of closeness and attachment, potentially impacting sexual functioning (Yehuda et al., 2015).

PTSD also disrupts a person's endocrinological, neurochemical, and neuroanatomical processes. For example, individuals with PTSD experience hyper reactive limbic systems and prolonged states of sympathetic nervous system (SNS) arousal (Yehuda, 2009; Zoladz & Diamond, 2013). In addition, among individuals living with PTSD, cortisol levels are often lower, leading to prolonged SNS activation (Brotto & Klein, 2010; Delahanty, Raimonde, and Spoonster, 2000; Yehuda, 2002). Testosterone may also be impacted by changes in cortisol; in men, testosterone has been found to decrease following cortisol release (Chatterton, Vogelsong, Lu, & Hudgens, 1997). These neurobiological systems are less able to suppress physiological arousal for individuals with PTSD, including hypervigilance and intrusive memories of the trauma (Yehuda et al., 2015).

The hormones and neurological networks involved in sexual functioning (including desire, arousal, and orgasm) are the same as those activated in PTSD, including the SNS, cortisol, norepinephrine, and testosterone (Yehuda et al., 2015; Zoladz & Diamond, 2013). Healthy sexual functioning requires an ideal level of SNS activation (Lorenz, Harte, Hamilton, & Meston, 2012). Too much or too little SNS activation would contribute to sexual dysfunction. There are differences between women with a history of sexual assault and those without in associations between SNS arousal and physiological sexual response. In one study, Rellini and Meston (2006) found that SNS arousal (through exercise) was not related to increased physiological sexual response for women with a history of CSA and PTSD, compared to women without CSA history who did show an increased physiological sexual response. Changes in

cortisol also impairs sexual functioning. After exposure to sexual stimuli, a non-clinical sample of women showed that an increase in salivary cortisol was related to less subjective desire, arousal, and sexual satisfaction (Hamilton, Rellini & Meston, 2008). It is hypothesized that the changes in hormones and SNS activation for individuals with PTSD impact sexual functioning because the physiological arousal present in PTSD becomes paired with fear and threat, instead of pleasure (Yehuda et al., 2015).

The Current Study

As reviewed above, there is a large body of literature documenting the relationship between sexual assault and sexual dysfunction, sexual assault and PTSD, and PTSD and sexual dysfunction. Yehuda and her colleagues (2015) proposed PTSD as a mediator between trauma and sexual dysfunction, however, they focused largely on nonsexual trauma in men or on sexual assault and general health outcomes among women in their review. Few studies have focused specifically on young adult women. Given that this population differs from adults in normative sexual experiences, and is at heightened risk for sexual assault, the applicability of Yehuda's model specifically to this population cannot be inferred from existing research.

The present study examined the relation between sexual assault, PTSD, and sexual functioning amongst young women drawing from the model proposed by Yehuda and colleagues (2015). For the purpose of this project, sexual functioning includes indicators of sexual satisfaction, sexual response, and sexual system strategies (hyperactivation or deactivation). Sexual functioning was measured with the Changes in Sexual Functioning Questionnaire, female version, (CSFQ-14-F; Keller, McGarvey, & Clayton, 2006) and the Sexual Systems Functioning Scale (SSFS; Birnbaum, Mikulincer, Szepeswol, Shaver, & Mizrahi, 2014). The CSFQ is a widely-used measure to evaluate sexual functioning including subdomains in desire, arousal,

orgasm and pain. The sexual disorders listed in the DSM-5 (e.g., Female Sexual Interest/Arousal Disorder) are structured around these subdomains (American Psychiatric Association, 2013).

The SSFS measure conceptualizes sexual behaviors as reflecting two dimensions, hyperactivation and deactivation. The concepts of sexual system hyperactivation or deactivation are rooted in attachment theory (Bowlby, 1969/1982), which utilizes an evolutionary framework to describe how individuals rely on relationships to survive. While research in attachment theory has focused primarily on activation of the attachment system in relationships, sexual relationships can be viewed similarly (Szielasko, Symons, & Price, 2013). According to attachment theory, humans have certain underlying cognitive-behavioral “systems” that serve evolutionary goals. For example, the attachment system includes set of behaviors (e.g., attending to actions of caretaker, crying to elicit help) meant to ensure bonding between a child and caretaker and thus the child’s survival. The sexual system serves the evolutionary function of reproduction. This system is made up of various behaviors and capacities (e.g., approaching a desirable partner, reading a partner’s signals) to help meet reproductive goals. In addition to reproduction, these behaviors contribute to positive romantic relationships and physical gratification, other important aspects of well-being (Birnbaum et al., 2014). Just as the nature of behaviors in the attachment system will vary based on early experiences (e.g., insecure attachment patterns) within the child-caretaker relationship, sexual system behaviors can also be shaped by negative sexual or relationship experiences. Birnbaum and colleagues (2014) described two possible forms of suboptimal sexual functioning--hyperactivation or deactivation. Hyperactivation of the sexual system involves intensifying mating efforts, more intense desire for sex, and more concern with engaging or maintaining partners. In contrast, deactivation

involves suppression of sexual needs and a view that sex is not a source of pleasure but rather of disappointment.

Using these conceptualizations of sexual functioning, three specific questions were addressed in this study: 1) Is there a relationship between sexual assault and sexual functioning among emerging adult women; 2) Do PTSD symptoms potentially mediate this relationship; and 3) Are there specific PTSD symptom domains that are particularly influential in the link between sexual assault and sexual dysfunction? These questions were addressed in two young adult samples (18-25 years old). The first sample included 230 female university students who participated in an online survey and a brief follow up. The second sample was drawn from a low-income, predominantly minority sample of young women of a similar age. Including two samples (one at university and one low-income from the community) helped provide a more complete picture of this age group.

Although a primary interest of this study was PTSD symptoms, these symptoms often occur with depression and dissociative symptoms due to both comorbidity and common elements (e.g., negative affect). Given overlap between PTSD with depression and dissociative symptoms, it is important to determine the specificity of relations between sexual assault, PTSD, and sexual functioning. Understanding whether it is PTSD symptoms specifically (versus generally poor mental health) that is related to sexual assault and sexual functioning can provide insight into potential mechanisms underlying the mental health-sexual function relation, and highlight important symptoms to target in intervention for women with mental health symptoms and sexual functioning problems. To address this question, I examined whether sexual assault history was associated with PTSD after controlling for depression and dissociation, and similarly whether PTSD was related to sexual functioning after controlling for these symptoms.

Finally, in the university sample, I included a brief one-month follow-up measure of recent sexual activity and functioning to examine prospective relations between sexual assault and PTSD symptoms on subsequent sexual functioning.

Study I Methods

Participants and Procedures

In Study I, 230 college women participated, with 197 completing the follow-up survey. The college student sample ranged from 18 to 23 years old ($M = 18.88$, $SD = .98$). The majority of the sample identified as White (65.1%), while 18.3% identified as Asian, 9.2% Hispanic, 3.1% Black, 2.6% mixed and 1.7% other. The sample was primarily college freshman (43%) and sophomores (37.4%). The majority of the sample identified as heterosexual (93.9%) and were living in a dorm on campus (83.9%). See Table 1 for further demographics. Female students accessed the online survey through the participant pool system. Procedures involved responding to survey questions online (via Qualtrics). The link took them to the study via Qualtrics, where they were asked to provide their ID number. Then, they read a description of the study and consented to participate. After providing consent, respondents answered the survey questions described in the measures section. For all questions, they were given the option of “prefer not to answer” or “I don’t know,” so they were not required to answer all questions. Initial surveys took about 45 minutes to complete. In the consent information, all students were told the study involved two phases, an initial survey and a brief follow-up. They received one credit at the completion of the initial survey and then a second credit after completion of the brief follow-up one month later. The follow-up was triggered via Qualtrics, which sent an email including the follow-up link 28 days after initial study completion.

Measures

Sexual Assault History. Participants were asked about their sexual assault history using 10 items, 7 items from the Sexual Experiences Survey (SES; Koss et al., 2007) and 3 items from interviews by Littleton, Grills-Taquechel, and Axsom (2009) and Orchowski and Gidycz (2012). The SES asked about sexual experiences that were unwanted. For example, “How often has someone had oral sex with you or made you have oral sex with them without your consent?” Participants answer “never,” “1 time,” “2 times,” or “3+ times.” Cronbach’s reliability for the SES in this study was .83. The other three questions ask how old the participant was the first time they had an unwanted sexual experience, what the relationship was with the person who did it to them, and if at the time of the assault the participant was using alcohol or drugs.

Sexual Functioning. Two measures of sexual functioning were included so as to measure both physiological and biological aspects of sexual functioning (the CSFQ-14-F) and subjective experiences of sexual functioning (the SSFS). Participants completed 14 items from the Changes in Sexual Functioning Questionnaire, female version, (CSFQ-14-F; Keller et al., 2006). Cronbach’s alpha demonstrated adequate reliability for this study ($\alpha = .87$). Participants do not have to be sexually active to complete this survey. The questions ask about participants’ sexual desire, arousal, orgasm and experiences of pain, such as: “How often do you have painful orgasms?”, “Are you easily aroused?”, and “How frequently do you engage in sexual thoughts?” Responses are on a five point Likert scale ($1=never$, $5=everyday/always$). Participants also completed the Sexual Systems Functioning Scale (SSFS; Birnbaum et al., 2014). This is a 24-item measure based on attachment theory and behavioral systems conceptualization of sex. The measure has two domains: hyperactivation (including items such as: “I worry about not being good enough in bed”) and deactivation (including items such as: “I feel comfortable responding

to my partner's sexual needs"). Using 18 samples, Birnbaum and colleagues (2014) demonstrated the reliability, concurrent validity, and predictive validity of the SFSS as a measure of sexual functioning. Cronbach's reliability for the current study was .81.

Sexual Activity and Health. Participants were asked nine questions about their sexual activity and health behaviors from the CDC Youth Risk Behavior Surveillance System (YRBS; Eaton et al., 2008). Sexual items asked whether the participant had yet engaged in specific acts (e.g. vaginal sex) and about sexual history (e.g., number of partners).

To assess typical sexual activity, participants answered eight questions based on the Sexual Activity Questionnaire (Byers & Heinlein, 1989) about how frequently in the past month they have engaged in different sexual behaviors (i.e., masturbation, kissing, fondling, oral sex, vaginal sex and anal sex). Participants responded using a five point Likert scale (*1=never, 5=everyday/always*) adapted from the CSFQ (Clayton, McGarvey, & Clavet, 1997). They also stated whether they have been to the gynecologist and if they used a condom or other methods to prevent pregnancy, the last time they had sexual intercourse. Though this is not a validated measure, Cronbach's alpha for the eight items indicated adequate reliability in the sample ($\alpha = .81$).

Sexual Functioning and Activity Follow-up. Participants were asked the same eight items about sexual activity in the past month (i.e., masturbation, kissing, fondling, oral sex, vaginal sex, and anal sex) from the measure above, as well as the 14 items from the CSFQ for the last month

PTSD. Participants' PTSD symptomatology was assessed using widely validated measures. Initially, participants completed a slightly modified version of The Life Events Checklist for DSM-5 (LEC-5; Weathers, Blake, Schnurr, Kaloupek, Marx, & Keane, 2013).

This 17-event check list asked participants to identify whether one or more of the events had happened to them, whether they had witnessed it happening to someone else, or whether they had learned about. Subsequently, participants identified their most distressing event: “looking above please enter the number of the event that was most stressful for you.” Those who did not identify a distressing event were asked: “thinking about the most stressful thing that has happened to you, please complete the following questions.” Participants were then assessed for PTSD symptoms using the Posttraumatic Stress Checklist for DSM-5 (PCL-5; Weathers, Litz, Keane, Palmieri, Marx, & Schnurr, 2013). This measure consists of 20 items, such as “feeling jumpy or easily startled.” Participants responded on a five-point Likert scale, 1 = *not at all*, 5 = *extremely*. Cronbach’s reliability for this study was .95. For this study, participants were not required to report on PTSD symptoms specifically due to a sexual assault; however, data was collected on the type of event they responded to so it was possible to look at symptoms specific to a sexual assault versus a different traumatic event. People who endorsed item #17 on the LEC checklist (“any other very stressful experience”) or did not endorse a stressful event from the LEC checklist were provided with a fill-in box and asked to give a very short description of the type of experience they had in mind while responding.

Depressive Symptoms. Participant depressive symptoms were assessed with the nine item Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001). Participants self-reported on the frequency of their depressive symptoms over the previous two weeks. They used a four point Likert scale (*1=not at all to 4=nearly every day*). The PHQ-9 items were derived from DSM-IV diagnostic criteria for Major Depressive Disorder. A total score of 10 or above was considered the clinical cutoff for “probable depression.” Cronbach’s reliability for this study was .88.

Dissociative Experiences. Participants completed the Brief Dissociative Experiences Scale (DES-B; Dalenberg & Carlson, 2010). This self-report measure contained eight items that assessed how severe their dissociative experiences were in the last week. Participants responded on a five point Likert scale (1= not at all, 5= more than once a day) to statements like: “I find myself staring into space and thinking of nothing; I find that I did things that I do not remember doing.” Cronbach’s reliability for this study was .78.

Demographic information. Basic demographic information was collected including participants’ birth date, race/ethnicity (Black, Hispanic/Latina, Caucasian/White, Asian, Native American, or Other), educational level, living location (on campus versus off campus), sorority affiliation, parental education level, and parental marital status. In addition to general marital status, participants were asked if they were in a romantic relationship and the length of the current relationship.

Data Analytic Plan

Prior to addressing research questions, descriptive statistics were used to document the frequency of specific variables (e.g., sexual assault experiences, sexual desire). T-tests and chi-square tests were used to examine bivariate relationships between all variables and to determine if certain demographic factors should be used as control variables (e.g., age, sexual experience). Initially, t-tests were used to compare women with and without a sexual assault history on sexual functioning variables. Subsequently, ANCOVAs were used to compare women with and without sexual assault history on sexual functioning variables, controlling for past vaginal intercourse since this variable was strongly related to sexual functioning (i.e., while the CSFQ measure can be used with women who have not yet engaged in intercourse, responses on many items would be expected to differ based on one’s sexual history). Correlations were used to evaluate

relationships between sexual functioning subscales and between mental health measures and sexual functioning subscales. Using bootstrapping methods, Hayes (2013) process macros were used to test for the direct and indirect relationships (via trauma symptoms) between sexual assault history and sexual functioning. Although tests of mediation in cross sectional data are problematic because they inflate associations (Maxwell & Cole, 2007), these tests were done to obtain preliminary insight into potential mechanisms of influence.

To test the research question about specificity, domains of PTSD symptoms, mean scores were computed for each of the four domains of PTSD symptoms. I examined bivariate relationships between each of the four domains and sexual functioning, to measure which is related to aspects of sexual functioning. In addition, I examined specificity by testing for unique associations between PTSD symptoms and sexual functioning, controlling for two other symptoms frequently related to trauma experiences, depression and dissociation. For longitudinal analysis, I used repeated measures ANOVA and hierarchical regression to determine if sexual assault or PTSD symptoms at baseline were predictive of change in sexual functioning on the CSFQ over the one month period. Data was analyzed using SPSS 20.

Power Analysis

As recommended by Kline (2005), a sample size of 200 participants is sufficient to test mediational models. Two hundred and thirty participants were included in the initial survey to allow for 15% attrition at the follow-up or for missing data. Based on G*power, this sample size provided sufficient power ($1-\beta=.80$) to detect small to medium effects ($r=.28$) in a mediational model with up to two covariates included. In large college samples, approximately 30% of respondents report some type of sexual assault; consequently, power should not be impacted by a low base rate of endorsement of sexual assault.

Study II Methods

Participants and Procedures

In an earlier study entitled *The Cultural Context of Health Disparities in Adolescent Girls*, funded by the NIH (1R21HD065185-01), information was collected about behavioral antecedents, cultural values, and family context of low income, high risk adolescent girls and their mothers. The sample consisted of 194 adolescent girls (59% Latina, 22% Black, 18% non-Hispanic White, 2% “Other”) and their mothers from the mid-sized, low-income city of New Britain, CT. Families were recruited from schools, health centers, community agencies, and through word-of-mouth incentives. Data was collected using adolescent self-report and parent-report surveys administered using audio computer-assisted self-interview (ACASI), observational dyadic interaction tasks, and qualitative methods. The aim of this study was to assist community partners with tailoring health programs to emerging adults in low-income communities.

The present study, Study II, was a brief follow-up survey to investigate the recent functioning of these daughters, who are now emerging adults. In the initial study, 85% of the sample agreed to be contacted for additional follow-up studies. In Study II, 38 young adult women participated. The sample ranged from 19 to 24 years old ($M = 22.46$, $SD = 1.34$), 30.6% were Hispanic, 27.8% White, 22.2% Black, 16.7% mixed, and 2.8% other (see Table 2). Contact was made to these families using multiple methods including mailings based on addresses they provided, emails, and phone-calls. I also used public information (e.g., white pages, people-search) to get updated addresses when available. Participants received a letter (email, text, etc.) describing the study and providing them the information on how to participate, including an electronic link to the online survey, or phone number to call for a phone interview. Participants

responded to survey questions via the online survey (via Qualtrics). Surveys took about 20-25 minutes for the daughters. Participants received a \$15 gift card as compensation for their time.

For those who chose to participate via the web (by computer or mobile device), they were given a web-link to the study via Qualtrics, where they were asked to provide the ID number to begin. Then, they read a consent page and were asked to agree. After providing consent, respondents answered survey questions described in the measures section. For all questions, they were given the option of “prefer not to answer” and “I don’t know,” so they were not required to answer all questions. At the end of the computer survey, respondents provided contact information for gift cards via a link to a second survey, to ensure information provided during the survey is not linked to personal contact information.

Measures

This study included several of the same measures as Study I. There were a few differences due to limited time and to be consistent with measures administered in the initial study.

Sexual Assault History. See description in Study I.

Sexual Functioning. Participants completed the Changes in Sexual Functioning Questionnaire, female version, (CSFQ-14-F; Clayton et al., 1997) to assess their current sexual functioning. See description in Study I.

Sexual Activity and Health. See description in Study I.

PTSD. Participants completed a modified version of The Life Events Checklist for DSM-5 (LEC-5; Weathers et al., 2013). For this study, the LEC-5 was modified to include 7 of the most likely events, instead of 17. This modification was consistent with the original New Britain Study. Subsequently, participants identified their most distressing event and were

assessed for distress due to PTSD symptoms using the Posttraumatic Stress Checklist-Civilian measure (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1994), based on DSM-IV criteria for PTSD instead of the PCL-5. To remain consistent with the initial data collection for the New Britain Study, this study continued to use DSM-IV criteria for PTSD, which consists of three primary domains which overlap with three of the four domains present in DSM-5.

Depressive Symptoms. See description in Study I.

Demographic information. Primary demographic information was collected in the original study, including participants' birthdate and race/ethnicity (Black, Hispanic/Latina, Caucasian/White, Asian, Native American, or Other). Mothers indicated how old they were when their first child was born, their educational level and that of the adolescent's father, their employment status, housing situation (e.g., rental, section 8 qualified, homeowner), and daughters' free lunch status at baseline. The current follow-up study collected updated information regarding the daughters' current monthly income, marital status, employment or educational status, and whether or not she has children.

Data Analytic Plan

The same data analytic plan was used as in Study I to examine if there were similar patterns, with the recognition that this community sample is underpowered. Still, this allowed us to examine if the patterns from Study I were generalizable beyond the college sample.

Power Analysis

Based on existing studies with similar populations and the time lapse, we expected response rates from 20-30% (approximately 35-60 families). Since this second sample is much smaller ($n = 38$), results were used descriptively rather than for significance testing.

Nonetheless, these results allowed us to examine if the relationships/patterns are similar across groups with distinct demographic characteristics.

Results

Study I Descriptive and Frequencies

Across the sample, 28.3% had never been sexually active. Of those who report being sexually active, 20.9% reported sexual activity more than twice a week; 30.4% reported sexual activity more than once a month, up to twice a week, and 23.5% reported rarely having sex. About 20 percent endorsed having had more than four partners in their lifetime, 9.1% reported three partners, 12.6% reported two partners, and 28.7% reported only one partner. The majority of the sample (41.3%) endorsed being 17-years-old the first time they had sex. In all subsequent analysis controlling for sexual history, a dichotomized variable reflecting whether the participant had or had not yet had vaginal intercourse was included.

On the five domains of sexual functioning on the CSFQ (desire frequency, desire interest, arousal, orgasm and the total functioning), the mean scores ranged from one to five, where 1 = never/no enjoyment and 5 = always/great enjoyment. The mean score for desire frequency was 2.91 ($SD = 1.04$), desire interest was 2.96 ($SD = 1.03$), arousal was 3.12 ($SD = .98$), orgasm was 3.01 ($SD = 1.27$), and the overall total was 3.16 ($SD = .82$). On the SSFS, the average was slightly higher for hyperactivation ($M=3.18$, $SD=1.21$) than deactivation ($M=2.99$, $SD=.91$). See Table 3 for relationships between the SSFS and the CSFQ.

Sexual assault experiences were measured using the SES. In this sample 35% reported an attempted sexual assault (oral, vaginal, or anal) and 20% reported a completed assault (oral, vaginal, or anal). The 36.5% who experienced either attempted or completed assaults were used for subsequent analyses. The item asking about other unwanted sexual experiences of lesser

severity (i.e., fondling) was not included. Of the types of completed sexual assault reported, the most frequent was vaginal (14%), followed by oral (9%) and anal (8%). Twenty-five percent reported attempted vaginal assault, 25% oral, and 13% anal. Within this sample, 8% stated they experienced an assault three or more times.

Depression and PTSD symptoms were measured on validated measures, which have clinical cut off scores. In this sample, 18.7% were above the cut off (score of 10) for depression and 15.2% were above the cut off (score of 30 or above) for PTSD symptoms. Only 8.7% completed the PTSD measure (PCL) thinking about a sexual assault experience.

Is There a Relationship Between Sexual Assault and Sexual Functioning?

The first set of analyses examined mean group differences in sexual functioning (using the CSFQ) based on sexual assault history (yes/no). When looking at raw score differences, individuals with sexual assault experiences appear to have better sexual functioning, driven by desire frequency, desire interest, and arousal (see Table 4). However, this pattern changed when controlling for past vaginal intercourse (see Table 5). Once past vaginal intercourse was controlled for, adjusted mean scores differed by group on sexual desire frequency ($F(1, 208) = 4.19, p = .04$) and a trend on sexual desire interest ($F(1, 208) = 3.23, p = .07$), while the arousal differences disappeared. Women with a sexual assault history reported greater desire frequency and interest than women without a sexual assault history.

When examining group differences in sexual hyperactivity and deactivation from the Sexual Systems Functioning Scale (SSFS) by sexual assault history, the groups differed on hyperactivity ($F(1, 208) = 6.40, p = .01$), but not deactivation. Women with a sexual assault history reported greater hyperactivity than women without a sexual assault. Interestingly, this group difference only emerged after controlling for sexual history (i.e., there was no group

difference in the t-test comparing the two groups but there was in ANCOVA results controlling for sexual history). Table 2 includes the correlations between the CSFQ and the SSFS sexual functioning measures.

How Does PTSD Relate to Sexual Assault and Sexual Functioning?

When comparing individuals who endorsed either an attempted or completed sexual assault to those without a sexual assault history, women with a sexual assault history were higher on PTSD symptoms ($t(227) = 5.31, p < .001, \text{Cohen's } d = .70$), ($M = 22.37, SD = 17.34$) compared to ($M = 11.76, SD = 12.72$). This group also showed higher levels of depression ($t(227) = 3.38, p = .001, \text{Cohen's } d = .46$) and dissociation symptoms ($t(226) = 2.91, p = .004, \text{Cohen's } d = .39$) (see Table 6). Thus, across the various mental health measures, women with a sexual assault history reported significantly more symptoms, with effect sizes in the medium range.

The second step to identifying potential indirect effects between sexual assault history and sexual functioning is to determine how PTSD relates to the sexual functioning measures. Table 7 presents correlations between mental health measures and the various sexual functioning measures. PTSD was correlated with desire interest ($r = .179, p = .007$) and hyperactivation ($r = .295, p < .001$). Depression and dissociation were also correlated with desire interest, hyperactivation, and deactivation. In general, however, correlations were nonsignificant or small in magnitude, suggesting PTSD symptoms were generally not related to many aspects of sexual functioning measured on the CSFQ. Of the sexual functioning measures, the SSFS-Hyperactivation domain was most consistently related to women's mental health.

Given the pattern of relationships presented in Tables 3 through 7, PTSD met criteria to be tested for indirect effects in only one relationship: sexual assault \rightarrow PTSD symptoms \rightarrow SSFS

hyperactivation. Using the process macro from SPSS, these variables were tested (with bootstrapping methods to obtain confidence intervals) to determine whether the magnitude of indirect effects was statistically significant. The direct effect from sexual assault on hyperactivation was not significant; .22 [95% CI -.11 to .55]. However, the indirect effect on hyperactivation was significant; .23 [95% CI .09 to .43]. Lastly, the total effect was significant; .46 [95% CI .13 to .79]. The ratio of indirect effect to total effect was .51, which indicated that 51% of the total effect is due to the indirect effect. In other words, the majority of the relation between sexual assault and greater sexual hyperactivation was attributable to PTSD symptoms. Although interpretations of mediation are limited in cross-sectional data, this pattern of results is consistent with the hypothesis that PTSD symptoms mediate the relationship between sexual assault and hyperactivation of sexual functioning systems.

Are Specific PTSD Symptom Domains Particularly Influential?

To further explore the relationships between sexual assault, PTSD symptoms and sexual functioning, the individual subdomains of PTSD were examined. These domains include intrusion symptoms (B), persistent avoidance (C), negative alterations in mood and cognitions (D), and alterations in arousal and reactivity (E). The B, C, D, E domains of the PTSD measure were not significantly correlated with the CSFQ domains or with the SFSS deactivation scale. Hyperactivation correlated with all PTSD subdomains ($r = .21 - .31$). Overall, there was no indication that one specific PTSD domain was related to the sexual functioning variables as predicted.

Specificity of PTSD in the Sexual Assault – Sexual Functioning Association

To evaluate whether sexual assault history is related to distinct aspects of PTSD above and beyond depression and dissociation, I conducted an ANCOVA with sexual assault as the

independent variable and PTSD symptoms as the dependent variable, controlling for depression and dissociation. Sexual assault was associated with more PTSD symptoms, even after controlling for these other symptom domains ($F(1, 222) = 15.49, p < .001$). I also ran post-hoc ANCOVAs testing depression and dissociation as dependent variables, while controlling for the other two respectively. Neither of these were significant (depression: $F(1, 222) = .378, p = .54$; dissociation: $F(1, 222) = 0.0, p = .99$). This pattern of results suggests that sexual assault was more closely tied to PTSD symptoms than depression or dissociation.

I then examined if the relationship between PTSD and sexual functioning would continue to hold, beyond depression and dissociation. In the bivariate correlations between PTSD and sexual functioning measures (presented in Table 7), PTSD was only correlated with desire and hyperactivation. In correlations controlling for depression and dissociation (Table 8), there were no significant associations. This suggests it is not the distinct parts of PTSD associated with those two domains of sexual functioning, but rather aspects of PTSD shared with related mental health conditions, such as depression and dissociation. Since PTSD was not significant beyond depression and dissociation, I did not test if the indirect effect of PTSD in relation to sexual assault and sexual functioning was significant above and beyond other mental health concerns.

Sexual Assault and PTSD as Predictors of Sexual Functioning Over Time

Does sexual assault predict a change in (total) sexual functioning over time? To test this question, I conducted repeated measures ANOVA with the sexual functioning measure (total score on the CSFQ) at the two-time points as a dependent variable and sexual assault as the independent variable. Results were nonsignificant ($F(1, 198) = .84, p = .36$). Across the college sample total sexual functioning scores were going up over the follow-up month (time 1 $M = 3.17$; time 2 $M = 3.36$; $F(1, 198) = 13.52, p < .001$), and this increase was largely due to those

students who started having sex during that period. While secondary to study findings, the significant increase over time suggests that the study sample and period (Introductory Psychology courses in the Fall semester) may be a time of significant change in sexual activity among female students. Consequently, differences in sexual functioning may not emerge till later in students' college experience.

To evaluate if PTSD was related to a change in total sexual functioning over time, I used hierarchical regression. In this analysis, CSFQ total scores at Time 2 was the dependent variable, CSFQ at Time 1 was entered first as a predictor and PTSD symptoms were included in a second block. Overall, the model was significant ($F(3, 197) = 15.88, p < .01$, total $R^2 = .08$). In addition, PTSD symptoms predicted a significant decrease in sexual functioning at time two, ($\beta = -.18, p < .01, \Delta R^2 = .03, F(1, 197) = 7.94, p < .01$). At the start of the study, baseline PTSD was not associated with total sexual functioning concurrently; however, baseline PTSD symptoms were predictive of later sexual functioning. Women with higher PTSD symptoms showed a decline in sexual functioning over the one month period. Together, these results suggest that sexual functioning increased for the whole group during the study period, however those women with elevated PTSD symptoms functioning did not show the same increase.

Study II Results

Descriptive and Frequencies

In Study II, 38 young adult women from the local community participated. Due to the small sample size and cross-sectional time point, the following analyses are descriptive and should be interpreted with caution. The goal of this sample was to determine if the general pattern of results was evident among young women of a similar age but from a more economically disadvantaged background than most university students and mostly not living on

college campuses. Of this sample, 27% had never been sexually active. About 29% reported sexual activity more than twice a week, while 31.6% reported sexual activity more than once a month, up to twice a week. About 34% endorsed having had more than four partners in their lifetime, 15.8% reported three partners, 13.2% reported two partners, and 2.6 percent reported only one partner. The majority of the sample (36.8%) endorsed being 16-years-old the first time they had sex.

On the five domains of sexual functioning on the CSFQ (desire frequency, desire interest, arousal, orgasm and the total functioning) the item scores ranged from one to five, where 1 = never/no enjoyment and 5 = always/great enjoyment. The mean score for desire frequency was 2.91 ($SD = 1.04$), desire interest was 2.96 ($SD = 1.03$), arousal was 3.12 ($SD = .98$), orgasm was 3.01 ($SD = 1.27$), and the overall total was 3.16 ($SD = .82$).

Sexual assault experiences were measured using the SES. In this sample 36.9% reported an attempted sexual assault (oral, vaginal, or anal) and 21.1% completed assault (oral, vaginal, or anal). The 36.8% who experienced either attempted or completed assaults were used for subsequent analyses. The item asking about less severe unwanted sexual experiences (i.e., fondling) was not included. Of the types of completed sexual assault reported, the most frequent was vaginal (18.4%), followed by oral (15.7%) and anal (5.3%). Twenty-six-point-four percent reported attempted vaginal assault, 26.3% oral, and 10.5% anal. Within this sample, 8% stated they experienced an assault three or more times.

Looking at the clinical cut off scores for the measures of depression and PTSD symptoms, about 34 percent of this sample was above the cut off for depressive symptoms and 21 percent of the sample was above the cut off for PTSD.

Is There a Relationship Between Sexual Assault and Sexual Functioning?

The first set of analyses examined the relationship between sexual assault and sexual functioning (using the CSFQ), controlling for past vaginal intercourse (see Table 9). Adjusted mean scores did not differ by group on any of the subdomains (desire, arousal, orgasm) or the CSFQ total. Women with a history of sexual assault did not differ on CSFQ scores compared to women without such history (see Table 9).

How Does PTSD Relate to Sexual Assault and Sexual Functioning?

Women with a sexual assault history reported more PTSD symptoms ($t(35) = 2.55, p = .015, \text{Cohen's } d = .85$), ($M = 1.55, SD = .98$) than their counterparts who had not experienced sexual assault ($M = .77, SD = .85$). This group also showed a trend for higher levels of depression ($t(36) = 1.90, p = .07, \text{Cohen's } d = .66$) (see Table 10). The magnitude of effect size differences suggests that limited power likely contributes to non-significant results.

Table 11 presents correlations between mental health measures and the various sexual functioning measures. After controlling for past vaginal intercourse, PTSD was correlated with desire-interest ($r = .38, p = .02$) and arousal ($r = .36, p = .04$). Depression was not correlated with any of the sexual functioning measures. In contrast to Study 1 in which there were few relations between PTSD symptoms and CFSQ domains, correlations between PTSD symptoms and CSFQ domains were moderate in size and generally statistically significant, despite the very small sample size.

Given the pattern of relationships presented in Tables 9 through 11, the following variables met criteria to be tested for indirect effects from sexual assault via PTSD: desire interest and arousal. Using the process macro from SPSS, these variables were tested to determine whether the magnitude of indirect effects was statistically significant, controlling for

having had vaginal intercourse. Neither of the indirect effects from sexual assault to PTSD symptoms to desire interest or arousal were significant. The lack of findings should be interpreted in the context of the very small sample size.

Specificity of PTSD

To evaluate whether sexual assault history is related to distinct aspects of PTSD above and beyond depression, I conducted an ANCOVA with sexual assault as the independent variable and PTSD symptoms as the dependent variable, controlling for depression and sexual experience. Sexual assault was not associated with more PTSD symptoms, when controlling for depression ($F(1, 36) = .966, p = .33$). I also ran a post-hoc ANCOVA testing depression as the dependent variable, while controlling for PTSD, which was not significant either ($F(1, 36) = .034, p = .85$). This pattern of results suggests that sexual assault was not more closely tied to either PTSD or depression symptoms, however in this small sample there is very limited power to examine specificity.

Afterwards, I examined if the relationship between PTSD and sexual functioning would continue to hold, beyond depression. In the bivariate correlations between PTSD and sexual functioning measures (presented in Table 11), PTSD was only correlated with desire and arousal. In correlations controlling for depression and vaginal intercourse (Table 12), there were no significant associations. This suggests it is not the distinct parts of PTSD associated with those two domains of sexual functioning, but rather aspects of PTSD shared with related mental health conditions (such as depression). Since PTSD was not significant beyond depression, I did not test if the indirect effect of PTSD in relation to sexual assault and sexual functioning was significant above and beyond other mental health concerns.

Discussion

Previous literature suggests that PTSD symptoms may be one cause of sexual dysfunction for trauma survivors (Yehuda et al., 2015). However, much of this research was conducted with men (Cosgrove et al., 2002; Helmer et al., 2013; Hirsch, 2009) or women (Cohen et al., 2012) in the military. In light of these limitations, this study examined the role of sexual assault and PTSD symptoms on sexual functioning in two samples of young women. Given high rates of sexual assault during the years of emerging adulthood, this is a critical developmental period for this line of research.

Relation Between Sexual Assault and Sexual Functioning

In both samples included in this study, approximately 37% of women reported a history of completed or attempted sexual assault. These rates are slightly higher than the rates (20-27%) reported in other studies of college women (Carey et al., 2015; Conley et al., 2017). In general, young women with a sexual assault history did not report worse sexual functioning as measured by the CFSQ once past vaginal intercourse was controlled. There was a small group difference on desire frequency in the university sample, but overall group differences were minimal. In prior studies, women with a sexual assault history had greater difficulties with sexual functioning, specifically low sexual desire, low arousal, pain or difficulties with orgasm (Kelley & Gidycz, 2019; Laumann et al., 1999; Sadler et al., 2012). One possible explanation for this difference is the age of focus in this study (Mean age 18.8). At this age, young women may not experience the severity of physiological sexual dysfunction required by the CSFQ measure since they likely have less overall sexual experience and involvement than older woman. For example, items on such as “frequency of painful orgasms” depend on the frequency of regular sexual activity. While the CSFQ is one of the most widely used measures of sexual functioning, it may

not be well suited to younger populations. For younger women, sexual dysfunction may instead present as sexual distress, as reflected in behaviors and attitude. Indeed, Hendricks and colleagues (2015) found that sexual distress was more frequent among younger women, while physiological sexual dysfunction increases with age. Rellini and colleagues (2007) also found that young adult women with a history of childhood sexual abuse reported greater sexual distress and did not show differences in sexual dysfunction. Consistent with this possibility, young women in the university sample with a sexual assault history did have higher scores on the SFSS hyperactivation scale. This scale measures concerns about sexual performance and sexual desirability, which are aspects of sexual distress more than physiological dysfunction.

Hyperactivation of the sexual system involves intensifying mating efforts, including more intense desire for sex and more concern with engaging or maintaining partners (Birnbaum et al., 2014). In contrast, deactivation involves suppression of sexual needs and a view that sex is not a source of pleasure but rather of disappointment. One might expect that an individual with a trauma history would avoid sexual encounters or thinking about sexuality; however, the current study findings do not support this assumption. Rather, findings suggest that experiences of sexual assault could lead to more frequent activation of the sexual system. If this is the case, it may be one of the mechanisms underlying revictimization. Women with a sexual assault history report engaging in more casual sex and many experience sexual revictimization (Classen, Palesh, & Aggarwal, 2005; Lemieux & Byers, 2008). Because having a hyperactivated sexual system is associated with more concern about one's sexual desirability and a tendency to feel better when pursuing sexual experiences (Birnbaum et al., 2014), young women with a sexual assault history and hyperactivated sexual system may seek more transient sexual experiences, putting them at risk for re-victimization. Previous studies have focused on PTSD symptoms and hazardous

drinking as potential mechanisms leading to revictimization (Littleton & Ullman, 2013). These findings suggest that aspects of the attachment system may also play a role.

Relation Between PTSD and Sexual Functioning

In both samples, young women with a sexual assault history reported worse mental health than peers, including PTSD, depression, and dissociation symptoms. This is consistent with a large body of prior research (for a review, see Campbell et al., 2009). In previous studies, PTSD symptoms are associated with physiological sexual dysfunction (Cosgrove et al., 2002; Letourneau et al., 1996). Results from this study are somewhat mixed. In the university sample, there was a small correlation between PTSD and more desire (frequency) in sex based on the CSFQ. In the community sample, there were moderate correlations between PTSD and sexual interest and arousal. Thus, rather than PTSD symptoms being associated with worse sexual functioning as operationalized by the CSFQ, these results would suggest that symptoms may be related to better sexual functioning, at least in some domains. However, as mentioned earlier, these young women may be thinking about sex more in a distressed manner. If so, they may endorse items like “I feel desire for sex” without that reflecting healthy sexual desire. For example, these women could desire sex, and then feel distressed that they are not actually sexually desirable. This is consistent with the correlation found between PTSD symptoms and hyperactivation in the college sample. It would be possible for someone with a hyperactivated attachment system who experiences preoccupation with their sexual desirability to score higher on some domains of the CSFQ without it reflecting healthier sexual functioning.

The differences in associations between PTSD symptoms and physiological sexual dysfunction in these two studies (few, small correlations in Study I, where the correlations were moderate in size and occasionally significant in Study II, despite the small sample size) may be

influenced by differences in the severity of mental health symptoms. More of the young women in Study II were above the cut off scores for depression and PTSD symptoms (34% and 21% respectively) compared to Study I where 19% were above the cut off for depression and 15% were above for PTSD symptoms. Though the two groups are reporting similar levels of sexual dysfunction, in Study II PTSD symptoms are more closely tied to the sexual functioning variables. As a higher risk sample, the population in Study II may have different experiences with PTSD. Alternatively, differences in the daily stressors, backgrounds, or relationship status's may influence the relationship between PTSD and sexual dysfunction in the two groups.

Sexual assault and PTSD were both related to hyperactivation of sexual system functioning. As a result, I tested if sexual assault had an indirect effect through PTSD on hyperactivation. The indirect effect on hyperactivation was significant, while the direct effect was not significant, with 51% of the total effect was due to the indirect effect. In other words, the majority of the relation between sexual assault and sexual function hyperactivation was attributable to PTSD symptoms. While tests of indirect effects in cross-sectional data should be interpreted as preliminary given the potential for effect sizes to be inflated (Maxwell & Cole, 2007), this finding extends Yehuda and colleagues' (2015) proposed model of PTSD as a mediator between trauma and sexual dysfunction to young adult women with a history of sexual assault. In particular, it highlights different domain of sexual functioning that may be impacted by trauma related symptoms associated with a sexual assault history. Most of Yehuda's work has focused on behavioral and physiological markers of sexual dysfunction; the current findings suggest that cognitive aspects of sexual functioning (e.g., attachment related cognitions about one's self as a sexual partner) could also be impaired.

Specificity of PTSD Compared to Other Mental Health Concerns

Research on trauma related symptoms and sexual functioning have tended to focus on PTSD. However, PTSD is only one type of trauma-related symptom. Focusing just on PTSD may miss other trauma-related symptoms that interfere with sexual well-being. In addition, a PTSD diagnosis is comprised of symptoms in four different domains, and sexual dysfunction may only be associated with some of these domains. To extend the body of literature on PTSD and sexual functioning, a secondary goal of this study was to better understand the specificity of PTSD-sexual functioning link. This was done in two ways: by looking at associations between PTSD and sexual assault and sexual functioning independent of depression and dissociation symptoms and by looking at how the different domains of PTSD relate to sexual functioning.

Results from Study I provided some evidence of specificity of the sexual assault – PTSD association. While sexual assault history was associated with higher levels of PTSD, depression, and dissociation, when unique aspects of each disorder were considered (i.e., differences in symptoms when controlling for the other two domains), only PTSD symptoms remained significant. These findings suggest that sexual assault has an impact on both common elements of PTSD, depression and dissociation (e.g., negative affect), as well as specific aspects of PTSD. Limited literature has looked at this phenomenon. Studies that do look at the comorbidity of PTSD and depression post trauma find that groups differ on severity of symptoms, not type of symptoms (depression versus PTSD; Au, Dickstein, Comer, Salters-Pedneault, & Litz, 2013; Stein & Kennedy, 2001). The severity groups in the study by Au and colleagues (2013) differed significantly on numbing, hyperarousal, PCL total score and the total depression score. Future work would help elucidate how mental health symptoms overlap and interact post trauma.

Subsequently, I examined if the relationship between PTSD and sexual functioning was similarly unique, above and beyond other mental health concerns. When controlling for depression (and dissociation in Study I) there were no significant relationships found between PTSD and the sexual functioning variables in either study. Because PTSD was generally unrelated to most of the physiological sexual functioning measures, the lack of significant partial correlations is not surprising. However, this does indicate that the relation between PTSD and sexual system hyperactivation may be a reflection of women with mental health problems or trauma symptoms (not necessarily PTSD) having greater preoccupation with their sexual desirability and performance. Although not a primary focus of this study, it is worth noting that PTSD symptoms were unrelated to sexual system deactivation, while depressive symptoms were. Future studies should explore the possibility that different types of symptoms are associated with different aspects of the sexual functioning system conceptualized in attachment theory (i.e., hyperactivation versus deactivation).

In terms of specific domains of PTSD, the literature posits that the PTSD hyperarousal may be particularly linked to problems with physiological sexual functioning (Rellini & Meston, 2006; Yehuda et al., 2015); however, there was no indication of this specific association in this sample. That is, the domain most related to total PTSD symptoms (hyperactivation) was correlated with all PTSD subdomains. One possibility is that because there was generally less sexual experience in this sample of university students, there was not enough variability in specific behavioral and physiological domains (e.g., pain during intercourse) to be correlated with specific domains of PTSD symptoms.

Longitudinal Findings: Changes in Sexual Functioning Over Time

Longitudinally, I was interested in whether sexual assault and PTSD predict a change in sexual functioning over time. There was no evidence that university women with a sexual assault history showed a decline or improvement in sexual functioning over the one-month period relative to women without that history. Across the sample, there was an overall increase in sexual functioning reported during the one month period, due largely to increases scores in the subset of women who began the study saying they had never had sexual intercourse. Many of these students were in their first or second year at college, and thus may have been becoming more sexually active as part of normative development. With increased activity, it is not surprising that their sexual functioning scores would go up. However, this does highlight the fact that the time period of this study (e.g., Fall semester for students predominantly in their first and second year of college) may be a developmental period that involves a lot of change in sexual functioning; consequently, studies with university samples may have different results depending on when data is collected.

Interestingly, findings did suggest that PTSD symptoms may be associated with a decline in sexual functioning over the one month period. Higher PTSD at baseline predicted lower sexual functioning at follow-up, when controlling for sexual functioning at baseline. Indeed, PTSD symptoms were negatively related to sexual functioning at Time 2, but unrelated at Time 1. This may again be due to the timing of the data collection. Young adulthood is a transitional period for women, where there is generally an increase in sexual activity; this may be especially true for students in the early parts of their college career. Possibly, as students gain more sexual experience, sexual functioning measures may have more variability. For example, a young woman who is not having sex is unlikely to report pain during sex. As more individual

differences in sexual functioning emerge during this developmental period, risk factor such as a sexual assault and PTSD may become more salient determinants of young women's sexual well-being.

Given the association between PTSD symptoms and hyperactive sexual system functioning, one possibility is that women elevated on both these measures seek out more sexual experiences because of preoccupation with sexual adequacy, but that these experiences are not necessarily enjoyable based on indicators of the CSFQ (e.g., orgasm). If so, these young women could be on a negative trajectory with regard to their sexual functioning. As a result, this may be a good time to intervene clinically to prevent worsening of sexual functioning over time.

Measurement of Sexual Functioning in Young Populations

In this population, sexual functioning was highly correlated with past vaginal intercourse. Approximately 28% of the university sample and 27% of the community sample reporting never having vaginal intercourse. In Study I, those with sexual assault history initially appeared to have healthier sexual functioning because they reported more desire frequency, desire interest, and arousal. However, after controlling for past vaginal intercourse, most of these associations no longer existed. Similarly, in the community sample, effect sizes (Cohen's *d*) based on raw scores were medium in size, but the adjusted means after controlling for past vaginal intercourse were much smaller. In other words, although this measure was designed to be usable with people who are not currently having sex, responses vary considerably in young women who have versus have not yet had vaginal intercourse. This finding speaks to the difficulty in research on healthy sexual functioning in young populations where women are just becoming sexually active. Young adulthood is a transitional period where there is significant variability in sexual experiences. This normative variability may "mask" variability due to other factors, such as

mental health. Moreover, we do not have a good sense of what is normative in this age group with regard to sexual behavior. For example, it is unclear at what age women begin looking at sexual reading material, and whether it is appropriate at any age for it to be considered dysfunction (e.g., avoidance) to not do so. Similarly, it is unclear whether not having an orgasm during a sexual experience should be considered sexual dysfunction in a newly sexually active population with limited sexual experience to understand their own preferences. The CSFQ uses questions similar to these to evaluate a person's difficulties with sexual desire, arousal, orgasm, and pain during sex when being evaluated for sexual dysfunction as conceptualized in the DSM IV. Young women may appear as though they have poorer sexual functioning, though this may be normative in this phase of sexual development. This is where a measure that investigates attitudes and behaviors, such as the Sexual Systems Functioning Scale (SSFS) may be better at assessing sexual health in this age group.

In addition to impacting measurement, the relationship between lack of sexual experience (vaginal intercourse in the present study) and sexual functioning leads to questions about whether or not to include those without sexual experience in studies on sexual assault. Screening for lack of sexual experience would lead to a larger sample with more accurate answers about their sexual functioning as it is evaluated by measures such as the CSFQ. However, not including these individuals could mean losing individuals impacted by sexual assault who do not consider themselves to have had sex. This is a small proportion of the population, but they may still experience significant negative consequences, such as genital injury (White & McLean, 2006). The field should evaluate this group more specifically to assess if they should be included in all studies or if they are a unique group and should be examined separately.

Future Directions

This study examined the relationships between sexual assault, PTSD, and sexual functioning for young women. Some of the most interesting findings were from the measure assessing sexual functioning from an attachment theory perspective (Birnbaum et al., 2014). Unfortunately, this measure was not included in the community sample; thus, it is unclear if the link found among the university sample would hold in a sample at higher risk. This measure should be used in a broader range of populations going forward. Additionally, future work should evaluate how a hyperactive system would relate to subsequent change in sexual behaviors and whether this approach to sexuality puts women at higher risk for sexual victimization or revictimization. More research is also needed on the relationship between deactivation and hyperactivation and if an individual could be high on both deactivation and hyperactivation, representing a potential maladaptive/disorganized approach to sexuality. Finally, the impact of sexual assault characteristics (i.e., severity, use of a weapon, perpetrator identity, substance use) on PTSD and hyperactivation should be evaluated, as these other factors have been found to impact the expression of PTSD symptoms (Culbertson & Dehle, 2001; Kaysen et al., 2010; Lindquist et al., 2013) and in turn potentially sexual functioning.

Finally, much of the current literature around sexuality with college students and younger adolescents typically focuses on sexual risk behaviors. It would be helpful if our future work evaluates the meaning of healthy sexual functioning in young adult women. Specifically, we need measures that include healthy sexual functioning of this population. The lack of research in this area likely reflects a cultural attitude about sexuality and women. In the United States, the sexuality of women is often not openly discussed or described as a normal, healthy part of development (Baumeister & Twenge, 2002). Especially for adolescent girls, where experiencing

no pleasure, desire or never having had an orgasm would not be identified as sexual dysfunction (Binik & Hall, 2014). This larger sociocultural context impacts the types of measures that have been developed for measuring young women's sexuality.

Limitations and Strengths

There are several limitations to this study. First, sexual assault history was collected retrospectively through a self-report measure. Although studies have demonstrated that SES is valid and reliable (Johnson, Murphy, & Gidycz, 2017), it is subject to biases associated with underreporting or difficulty remembering details (Hardt & Rutter, 2004). Second, though this study was longitudinal, it was limited to a one month follow-up, which limits our ability to assess temporal precedence. Especially when considering sexual functioning, we cannot be sure how functioning changes over the course of a year, before, and after an assault experience. In addition, the mediational analyses were based on the cross-sectional data. Third, not all of the participants reporting on PTSD symptoms would meet Criterion A- having experienced a traumatic event, they were given the option to respond about a stressful experience that would not qualify (i.e., a break up with partner). Only about nine percent of women from the college sample responded to the PCL (to assess PTSD symptoms) about a sexual assault. Fourth, as described earlier, many young adult women in the sample had yet to initiate sex, which potentially confounded some measures. I chose not to select on sexual history so as to allow for participation of women who may have had a sexual assault but not consider themselves as having had sexual intercourse yet (five women in this sample). A larger cohort of these individuals would be needed to meaningfully evaluate their sexual functioning.

Despite these limitations, this study also had several strengths, including multiple measures of sexual functioning. The definition for sexual assault in this study was kept broad, to

include attempted or completed assault. This project also included two samples, a college sample and a community sample from a higher risk population (i.e., low-income women, primarily Latina) who are disproportionately impacted by negative sexual health outcomes (e.g., unplanned pregnancy, HIV); research focusing on the sexual functioning in these young women is particularly important to inform evidence-based interventions.

Clinical Implications

This study of young adult women demonstrates the need for clinical interventions for sexual assault that are tailored to this age group and address not only mental health, but also sexual functioning and distress. Interventions addressing sexual assault on college campuses are often aimed at education, increasing awareness, and prevention. These programs are important in increasing knowledge about sexual assault, however, there is little evidence that they decrease the prevalence of sexual assault on college campuses (Anderson & Whiston, 2005) and they do not directly help those who have been assaulted. Additionally, almost half of undergraduate students do not acknowledge their sexual assault experience (Cleere & Lynn, 2013) and the majority do not seek treatment (Russell & Davis, 2007). Thus, interventions are needed to identify these individuals and encourage those who are struggling to seek treatment.

College women who seek help after sexual assault are often first referred to medical healthcare professionals or rape crisis centers. The process of disclosure and reporting of sexual assault can be very long and complex, involving many social systems (i.e., police, medical examiners, mental health services). When these young women are successfully connected with treatment, they may not have access to the most supportive types of therapy. For example, cognitive behavioral therapy and exposure therapy have the strongest empirical support for treatment of sexual assault (Russell & Davis, 2007), however rape crisis centers (where students

may be most likely to go) may not offer these treatments. Although there is less empirical support, it seems many rape crisis centers predominantly rely on crisis intervention (Bennice & Resick, 2002). These findings and the current study support the need for training of university providers and better access to helpful, evidence-based interventions for young adult women who experience sexual assault.

Young adult women who manage to become connected with treatments are often treated for trauma symptoms, and interventions rarely target sexual difficulties. There are a number of reasons sexual difficulties are not addressed if a client is presenting for treatment of PTSD. First, sexual problems are not typically included in an assessment of PTSD and thus may not be identified (O'Driscoll & Flanagan, 2016). The current study supports the notion that sexual problems should be assessed among patients who have sexual assault history and PTSD, including changes in sexual attitudes or distress. Secondly, clinicians may assume that the concerns will improve while treating the PTSD (O'Driscoll & Flanagan, 2016). There is a growing body of literature that suggests treatments for PTSD have little to no effect on sexual problems (Baggett, Eisen, Gonzalez-Rivas, Olson, Cameron, & Mona, 2017; O'Driscoll & Flanagan, 2016). In exposure therapy for PTSD, for example, male veterans showed no improvement in sexual problems and those with comorbid sexual dysfunction even showed less improvement in PTSD symptoms (Badour, Gros, Szafranski, & Acierno, 2016). One study of military women, similarly showed no difference in sexual problems after prolonged exposure, except when there was a loss of PTSD diagnosis (Schnurr, Lunney, Forshay, Thurston, Chow, Resick, & Foa, 2009). Finally, practitioners may not feel able to treat sexual concerns or feel the sexual difficulties should be treated by a specialized sex therapist, after the trauma symptoms have remitted (O'Driscoll & Flanagan, 2016). Few psychological training programs in the

United States or Canada specifically prepare students to treat issues of sexuality (Mollen, Burnes, Lee, Abbott, 2018; Reissing & Giulio, 2010). The lack of sufficient training leaves psychotherapists unprepared to deal with the common issues of sexuality. The present study suggests not only that our field needs to be prepared to address sexual dysfunction and distress post sexual assault, but also the importance of doing so across the lifespan.

Due to the cultural expectations of sexuality during adolescence, many of the interventions for sexual dysfunctions were developed for adults. In this population of young adult women, focusing on arousal or pain issues may not help those having sexual difficulties because the difficulties are presenting as sexual distress and anxiety. In adults, sexual dysfunction interventions focus on a combination of pharmacological management and psychotherapy, including mindfulness, cognitive-behavioral therapy, writing interventions, and the common sex therapy technique of “sensate focus” (graduated emphasis on sensations; Binik & Hall, 2014). Sensate focus can be combined with in vivo exposure. Many of these interventions are done in the context of a sexual relationship (Baggett et al., 2017). The young adult women with a history of sexual assault may not have a partner or may not be engaging in sexual encounters in which they could practice “touch exposures.” Further research about interventions for adolescents and young adults with sexual problems is needed to better address the needs of this unique population.

Conclusion

This study has expanded the literature on sexual assault, PTSD, and sexual functioning in young adult women. Findings highlight that young adult women with a history of sexual assault and who have more PTSD symptoms may have specific types of sexual functioning problems, including a hyperactive sexual system (a preoccupation with feelings of sexual inadequacy).

Contrary to hypotheses, young women with a sexual assault history did not report worse sexual functioning (in the domains of desire, arousal, orgasm or pain) once past vaginal intercourse was controlled. This suggests that in this age group sexual difficulties may present more as sexual distress. The nature of this sexual distress (hyperactivation) may lead them to seek more sexual experiences, potentially putting them at risk for re-victimization. Additional research using a larger sample of young adult women with a history of sexual assault is needed to elucidate the long-term implications of sexual assault on sexual functioning and re-victimization. This information could improve clinical interventions for young adult women with a history of assault and help prevent future difficulties with sexual functioning in adulthood.

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Table 1. Study I Demographic Information on Women with and without SA History

	Sexual Assault History N = 84	No Assault History N = 145	χ^2 or <i>t</i> -value
Race			15.49*
White (N = 149)	38.9%	61.1%	
Asian (N = 42)	16.7%	83.3%	
Hispanic (N = 21)	57.1%	42.9%	
Black (N = 8)	14.3%	85.7%	
Mixed (N = 6)	66.7%	33.3%	
Other (N = 4)	50.0%	50.0%	
Romantic Relationship			0.96
Yes (N = 106)	39.6%	60.4%	
No (N = 122)	33.9%	66.1%	
Year in School			1.22
Freshman (N = 99)	34.3%	65.7%	
Sophomore (N = 86)	40.0%	60.0%	
Other (N = 45)	24.3%	75.7%	
Living Location			6.69
In Dorm (N = 193)	35.9%	64.1%	
Other (N = 37)	40.5%	59.5%	
Sexual Orientation			1.17
Heterosexual (N = 216)	36.3%	63.7%	
Homo, Bi, Other (N = 14)	42.9%	57.1%	
Sex Ever			24.92**
Yes (N = 164)	46.3%	53.7%	
No (N = 65)	10.9%	89.1%	
OBGYN checkup			5.64
Never been (N = 118)	31.6%	68.4%	
Only last year (N = 45)	33.3%	66.7%	
Annually (N = 61)	49.2%	50.8%	

Note. + = $p < .1$; * = $p < .05$; ** $p < .001$; SA = Sexual Assault; Homo = Homosexual; Bi = Bisexual.

Table 2. Study II Demographic Information on Women with and without SA History

	Sexual Assault History N = 14	No Assault History N = 24	χ^2 or t-value
Race			3.22
White (N = 10)	60.0%	40.0%	
Hispanic (N = 11)	27.3%	72.7%	
Black (N = 8)	37.5%	62.5%	
Mixed (N = 6)	33.3%	66.7%	
Other (N = 1)	0%	100%	
Romantic Relationship			1.03
Yes (N = 24)	41.7%	58.3%	
No (N = 13)	30.8%	69.2%	
Avg. Monthly Income			6.42
Under \$500 (N = 13)	46.2%	53.8%	
\$500-1000 (N = 12)	41.7%	58.3%	
\$1000-2000 (N = 5)	60.0%	40.0%	
Over \$2000 (N = 3)	0%	100%	
Living location			4.82
With mom (N = 19)	36.8%	63.2%	
At college (N = 10)	50.0%	50.0%	
Other (N = 9)	30.0%	70.0%	
Sexual Orientation			6.27
Heterosexual (N = 28)	35.7%	64.3%	
Homo, Bi, Other (N = 8)	50.0%	50.0%	
Sex Ever			4.52*
Yes (N = 27)	48.1%	51.9%	
No (N = 10)	10.0%	90.0%	
OBGYN checkup			4.68
Never been (N = 9)	11.1%	88.9%	
Only last year (N = 7)	42.9%	57.1%	
Annually (N = 20)	50.0%	50.0%	

Note. SA = Sexual Assault; Homo = Homosexual; Bi = Bisexual

Table 3. *Study I Correlations Between CSFQ and SSFS subscales / Correlations Controlling for Sexual Intercourse*

	Hyperactivation	Deactivation
Desire Frequency	.03 / .02	-.62** / -.54**
Desire Interest	.22** / .24**	-.41** / -.31**
Arousal	.05 / .04	-.59** / -.48**
Orgasm	-.12 / -.13	-.51** / -.46**
CSFQ Total	.00 / -.02	-.67** / -.59**

Note. + = $p < .1$; * = $p < .05$; ** $p < .001$; CSFQ = Changes in Sexual Functioning Questionnaire; SSFS = Sexual Systems Functioning Scale.

Table 4. *Study I Mean Scores and Standard Deviations of Sexual Functioning for Women with and without SA History*

	Total N= 228	Sexual Assault History	No Assault History	<i>t-value</i>	<i>Cohen's d</i>
Desire Frequency	2.91(1.04)	3.36(.88)	2.80(1.04)	3.41**	0.58
Desire Interest	2.96(1.03)	3.25(.95)	2.90(1.03)	2.12*	0.35
Arousal	3.12(.98)	3.45(.85)	3.02(1.00)	2.67*	.46
Orgasm	3.01(1.27)	3.22(1.19)	2.95(1.29)	1.30	.22
CSFQ Total	3.16 (.82)	3.44(.71)	3.10(.83)	2.61*	.44
Hyperactive	3.18 (1.21)	3.32(1.15)	3.15(1.22)	.88	.14
Deactive	2.99 (.91)	2.82(.84)	3.04(.93)	-1.49	-.25

Note. + = $p < .1$; * = $p < .05$; ** $p < .001$; SA = Sexual Assault.

Table 5. Study I Adjusted Mean Scores and Standard Errors of Sexual Functioning for Women with and without SA History (controlling for past sexual intercourse and year in college)

	Sexual Assault History	No Assault History	<i>F</i> (1, 208)
Desire Frequency	3.16(.09)	2.92(.07)	4.19*
Desire Interest	3.18(.11)	2.92(.09)	3.23+
Arousal	3.26 (.09)	3.12(.07)	1.37
Orgasm	2.98(1.3)	3.07(.11)	.31
CSFQ Total	3.29 (.08)	3.23(.06)	.37
Hyperactive	3.44(.13)	3.02(.10)	6.40*
Deactive	2.96(.09)	2.90(.07)	.20

Note. + = $p < .1$; * = $p < .05$; ** $p < .001$; SA = Sexual Assault.

Table 6. *Study I Mental Health Differences Between Women with and without SA History*

	Total N= 228	Sexual Assault History N= 82	No Assault History N =146	<i>t-value</i>	<i>Cohen's d</i>
PTSD	15.70 (15.44)	22.37 (17.34)	11.76 (12.72)	5.31**	0.70
Depression	6.50 (5.74)	8.13 (5.99)	5.54 (5.36)	3.38**	0.46
Dissociation	6.36 (6.41)	7.96 (6.85)	5.44 (5.98)	2.91*	0.39

Note. + = $p < .1$; * = $p < .05$; ** $p < .001$; SA = Sexual Assault.

Table 7. Study I Correlations Between Mental Health Measures and SF subscales / Correlations Controlling for Sexual Intercourse

	PTSD	Depression	Dissociation
Desire Frequency	.11 / .05	.02 / -.09	.06 / .04
Desire Interest	.18* / .16*	.14* / .12	.15* / .17*
Arousal	.10 / .06	-.00 / -.05	.05 / .08
Orgasm	-.02 / -.03	-.11 / -.15*	-.02 / -.00
CSFQ Total	.08 / .02	-.01 / -.10	.05 / .03
Hyperactivation	.30** / .30**	.30** / .32**	.22** / .23**
Deactivation	.13 / .17*	.20** / .29**	.14* / .16*

Note. + = $p < .1$; * = $p < .05$; ** $p < .001$; SF = Sexual Functioning.

Table 8. *Study I Correlations Between PTSD and SF subscales, Controlling for Sexual Intercourse, Depression, and Dissociation*

	PTSD
Desire Frequency	.12+
Desire Interest	.07
Arousal	.11
Orgasm	.05
CSFQ Total	.09
Hyperactivation	.12+
Deactivation	-.02

Note. + = $p < .1$; * = $p < .05$; ** $p < .001$; SF = Sexual Functioning.

Table 9. *Study II Mean Scores and Standard Deviations of Sexual Functioning for Women with and without SA History*

	Sexual Assault History	No Assault History	Cohen's <i>d</i>	<i>F</i> (1, 30)
Desire Frequency	3.07 (1.00)	2.57 (1.29)	0.43	.87
Desire Interest	2.83 (.96)	2.52 (.76)	0.35	.08
Arousal	3.36 (.80)	2.77 (.95)	0.74	1.14
Orgasm	3.43 (.65)	2.78 (1.37)	0.63	.32
CSFQ Total	3.32 (.58)	3.22 (.89)	0.72	.00

Note. ⁺ = $p < .1$; * = $p < .05$; ** $p < .001$; SA = Sexual Assault. Sample size was 30 because several respondents did not answer orgasm questions, but the pattern remains the same with or without those questions included. The *F* value is based on ANCOVA adjusting for past sexual experience.

Table 10. *Study II Mental Health Differences Between Women with and without SA History*

	Total N= 38	Sexual Assault History N = 14	No Assault History N = 24	<i>t-value</i>	<i>Cohen's d</i>
PTSD	18.19 (16.44)	26.43 (16.59)	13.17 (14.50)	2.55*	0.85
Depression	8.03 (6.34)	10.50 (5.39)	6.58 (6.50)	1.90+	0.66

Note. + = $p < .1$; * = $p < .05$; ** $p < .001$

Table 11. *Study II Correlations Between Mental Health Measures and SF subscales / Correlations Controlling for Sexual Intercourse*

	PTSD	Depression
Desire Frequency	.38* / .25	.19 / .18
Desire Interest	.46** / .38*	.25 / .24
Arousal	.45** / .36*	.20 / .18
Orgasm	.23 / .11	.11 / .07
CSFQ Total	.28 / .14	-.04 / -.11

Note. ⁺ = $p < .1$; * = $p < .05$; ** $p < .001$; SF = Sexual Functioning.

Table 12. *Study II Correlations Between PTSD and SF subscales, Controlling for Sexual Intercourse and Depression*

	PTSD
Desire Frequency	.24
Desire Interest	.35+
Arousal	.31
Orgasm	.07
CSFQ Total	.27

Note. + = $p < .1$; * = $p < .05$; ** $p < .001$; SF = Sexual Functioning.

Figure 1. PTSD Mediating the Relationship Between Sexual Assault and Sexual Functioning

