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When and why are difficulties with sexual functioning distressing to women? Building a contextual model of sexual dysfunction

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When and why are difficulties with sexual functioning distressing to women? Building a contextual model of sexual dysfunction

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Dedication

"If you were successful, somebody along the line gave you some help … Somebody helped to create this unbelievable system we have that allowed you to thrive."
-- Barack Obama

This dissertation is dedicated to the people who made me believe I could to anything, especially my parents and my profoundly amazing wife. My friends Ryan, Brandon, Joe, Issam, Marcelo, Tim, and Susan make the whole journey worthwhile. Lastly, this project is dedicated to the teachers that inspired me, especially Kieran Sullivan, Amara Brook, and Cindy Meston.

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When and why are difficulties with sexual functioning distressing to women? Building a contextual model of sexual dysfunction

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Recent research suggests that, while up to 58% of women may experience significant difficulties with sexual function, only a third of these difficulties are associated with clinically relevant levels of subjective distress, suggesting a complex relationship between these two factors. We have relatively little understanding as to when sexual difficulties are distressing to women and why some difficulties are distressing while others are not. The current project aimed to begin answering these questions in a number of ways. First, I attempted to replicate previous findings regarding moderators of the association between sexual function and subjective distress. Second, I attempted identify the behavioral and cognitive mechanisms through which sexual impairments cause distress. Participants were 87 adult women from the local community who reported recurrent impairments in sexual function in the past month, and who were currently in sexually-active heterosexual relationships. Participants completed in-person diagnostic interviews and validated self-report measures before completing four weeks of daily online questionnaires assessing their sexual and relational experiences. Results provided additional support for previously identified moderators including relational satisfaction, age, and history of childhood sexual abuse. Additionally, a number of factors mediated the association between sexual function and distress within individuals over time.

Specifically, a majority of the statistical effect of sexual function on subjective distress was accounted for by the degree to which impaired sexual function decreased the physical pleasure experienced by the individual during sexual activity. Other consequences of impaired sexual function such as decreased frequency of sexual activity and negative emotional reactions by the partner did not mediate this association. These findings add to theories of sexual dysfunction by taking into account the important ways in which sexual impairments play out in the context of romantic relationships. The results also may explain mechanisms through which current treatments for sexual dysfunction decrease sexual distress, potentially improving our ability to focus interventions on the factors that are of greatest importance to patients.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

"Sexual function" is generally broken down into five components based on the pioneering work of Masters and Johnson (1966) and the subsequent contributions of researchers such as Helen Kaplan (1995); much of the following definitions are paraphrased from Rosen et al. (2000) unless otherwise noted:

1. *Sexual Desire* refers to a feeling that includes wanting to have a sexual experience, feeling receptive to a partner's sexual initiation, and thinking or fantasizing about having sex. Difficulties with desire include a lack of desire, receptivity, and/or use of fantasy.
2. *Subjective Sexual Arousal* refers to feeling turned on, excited, or "into it" during sex. Difficulties with subjective arousal include not feeling turned on during sex.
3. *Physiological Sexual Arousal* generally refers to the results of increased blood flow to the vagina and surrounding areas, which induce feelings of warmth or tingling in the genitals, lubrication (wetness), and/or muscle contractions. Difficulties with physiological arousal include a lack of lubrication, and/or genital swelling, tingling, or warmth.
4. *Orgasm* has been difficult to define (Mah & Binik, 2001). However, it is generally understood as a "peak sensation of intense pleasure creating an altered state of consciousness usually accompanied by involuntary rhythmic contractions of the pelvic muscles… that resolves the sexually induced vasocongestion… usually with an introduction of well-being and contentment." (Meston, Hull,

Levin, & Sipski, 2004). Difficulties with orgasm include difficulty in reaching, or inability to reach, orgasm during sexual activity.

5. *Sexual Pain* refers to pain or discomfort in the genital or pelvic area during or following sexual activity. Difficulties with sexual pain include the presence of noticeable pain.

In ideal cases, women experience no impairments in any of these areas, i.e., a woman's level of desire and arousal are normatively appropriate and satisfactory to both her and her partner(s), it is easy to reach orgasm, and any physical discomfort during sex is minimal. However, impairments in female sexual function are among the most commonly reported health problems in the U.S. with estimated 1-year prevalence rates ranging from 32% to 85% (Hayes, Dennerstein, Bennet, & Fairley, 2008; Laumann, Palik, & Rosen, 1999; MacNeil & Byers, 1997). Although estimates differ widely, the most common sexual impairment appears to be low sexual desire (64%), followed by difficulties with orgasm (35%), arousal (31%), and sexual pain (26%; Hayes, Bennet, Fairley, & Dennerstein, 2006).

While it is clear that impairments in female sexual function are widely prevalent, the question of how to define these impairments has been a source of controversy in the field. The first reason that impaired sexual function has been difficult to define is that "impairments" must always be assessed in relation to normative levels of a construct. However, many researchers are skeptical of the concept of "normative" levels of sexual function (Tiefer & Hall, 2010), suggesting that an individual's sexual experience should be compared to their desired quality of interaction rather than social norms defined by an

externally-imposed value system. Secondly, DSM-IV-TR diagnostic criteria (APA, 2000) specify that some impairments should only be labeled as *sexual dysfunction* if they occur in the absence of specific medical conditions. Unfortunately, this criterion requires a full medical examination, a process that is rarely included in the diagnostic process due to high cost. Thirdly, impairments in sexual function are typically conceptualized as intra-individual conditions, meaning that simple discrepancies between partners in terms of sexual desire or arousal to do not imply an "impairment" so long as neither partner exhibits abnormally low levels of desire/arousal.

This last difficulty is of particular importance given that males typically report higher levels of sexual desire than females (Baumeister, Catanese, & Vohs, 2001). Indeed, much research in the field of evolutionary psychology supports the evolutionarily adaptive value of differences in sex drive and socio-sexuality (Schmitt, 2005) and suggests that this difference is generally biologically-based and universal across cultures. Although a number of researchers have provided evidence that conflicts somewhat with the conceptualization of purely biologically-based differences in sex drive (Eagly & Wood, 2005), the fact remains women report lower sexual desire than males on average (Lippa, 2009), and there is evidence suggesting that this difference may increase over the course of romantic relationships (Klusmann, 2006). In the context of these normative differences in sexual desire, it is often difficult to determine whether a women is experiencing "impaired" sexual desire, or simply less desire than her partner.

Despite these difficulties of defining impairments in female sexual function, it is essential to study these impairments for a number of reasons. First, sexual activity has

been rated as a very important aspect of people's lives worldwide (Mulhall, King, Glina, & Hvidsten, 2008) and impaired sexual function has been shown to be associated with decreased personal well-being in a number of studies (e.g., Hurlbert, Apt, & Rabehl, 1993; Morokoff & Gillilland, 1993). For example, a recent study assessing moment to moment happiness suggested that sexual activity was by far the activity most closely associated with well-being (Killingsworth & Gilbert, 2010). Additionally, unsatisfying sexual activity has been tied to lower relationship satisfaction in a number of studies (Byers, 2005) and is one of the best predictors of divorce (Karney & Bradbury, 1995). Given this importance, many studies have been published over the past decade identifying risk factors for self-defined impairments in female sexual function. For example, researchers have found that impaired sexual function is more common in post-menopausal women (especially in cases of surgically induced menopause; Shifren, Monz, Russo, Segreti, & Johanes, 2008; Hayes et al., 2008), women whose partners are experiencing erectile dysfunction (Oberg & Fugl-Meyer, 2005), women reporting mental health difficulties (Hayes et al., 2008), women reporting less satisfying relationships (Oberg & Fugl-Meyer, 2005), and women with poorer physical health (Kang, Laumann, Glaser, & Palik, 2005).

However, one of the most interesting findings in these recent studies has been that impairments in female sexual function are not always associated with negative subjective

outcomes such as increased sexual distress or decreased sexual satisfaction[1] (Hayes et al., 2008; Oberg & Fugl-Meyer, 2005; Shifren et al., 2008). For example, Ferenidou and colleagues (2008) found that 80% of their sample were satisfied with their sexual function, despite the fact that almost 70% reported at least one difficulty with sexual function. Likewise, a 2007 study found that, although 38% of their sample qualified for a least one ICD-10 diagnosis of sexual dysfunction, only 6% of the sample was greatly distressed by their sexual symptoms (King, Holt, & Nazareth, 2007). Additionally, studies have found that, while rates of difficulties with sexual function tend to increase with age, rates of function problems with significant concurrent sexual distress tend to be highest in middle-aged women as compared to older women (Rosen et al., 2009; Shifren et al., 2008). Indeed, even in clinical trials of treatment for female sexual dysfunction, researchers have reported a relatively large subset of women who see their sexual difficulties as minor inconveniences (Stravynski et al., 2007), limiting their engagement in treatment.

While these studies have effectively made the case that impaired female sexual function is not always distressing, they generally do not address the question of when impaired sexual function is distressing and when it is not. To begin exploring this question, my colleagues and I have recently conducted a number of studies assessing the

[1] In the current proposal Sexual Distress refers to concern, anxiety, and/or frustration regarding one's sex life, a definition in line with those currently used in the field of female sexual dysfunction (Derogatis, Rosen, Leiblum, Burnett, & Heiman, 2002). Sexual Satisfaction has been defined as the individual's subjective evaluation of the positive and negative aspects of one's sexual relationship, and his/her subsequent affective response to this evaluation (Lawrance & Byers, 1992). As recent studies have suggested that sexual distress and satisfaction may be partially independent constructs (Stephenson & Meston, 2010), I refer to them separately throughout the proposal, or jointly as sexual "well-being."

strength of association between measures of female sexual function and subjective sexual distress. In the first (Stephenson & Meston, 2010), we found that both relational intimacy and attachment anxiety moderated this association in undergraduate women. Impairments in some aspects of sexual function were associated with high distress only in the context of relationships with little intimacy, especially for women high in attachment anxiety. In other cases, even highly impaired sexual function was not associated with significant distress. This study was one of the first to specifically identify factors that statistically moderated the association between sexual function and distress in women, and also suggested that relevant moderating factors may differ depending on the aspect of sexual function under consideration.

In a second study (Stephenson, Hughan, & Meston, 2012), we compared women with and without histories of childhood sexual abuse (CSA) and found that multiple aspects of sexual function were more weakly tied to sexual distress for women with a history of CSA. Specifically, women with a history of CSA reported high distress even in the context of only slightly impaired sexual function. This disconnect between sexual function and distress was even more pronounced for women who were abused by a family member. In a third study (Stephenson & Meston, 2012), we found that age also moderated the association between sexual desire and distress such that the two were more strongly associated for younger women as compared to older women, replicating the findings of earlier studies (Rosen et al., 2009).

While the initial goal of these studies had been to identify protective factors – contexts in which women reported little distress despite impairments in sexual function –

a more complicated picture emerged from the findings. While we did identify a number of protective factors (e.g., relational intimacy, attachment orientation), we also found a number of cases in which women reported high levels of sexual distress in the context of non-impaired or slightly impaired sexual function. In particular, older women and women with a history of CSA were fairly distressed about their sex lives on average regardless of their level of sexual function (Stephenson et al., 2012; Stephenson & Meston, 2012)

The potential practical importance of such findings was underscored by another study (Stephenson, Rellini, & Meston, 2013) in which we found that improvements in sexual function over the course of sex therapy were only associated with decreases in sexual distress in certain cases. Specifically, women who were relatively satisfied with their overall relationships (despite meeting criteria for sexual dysfunction) exhibited decreased distress in response to improvements in sexual function. This association – that improvements in sexual function are associated with improvements in subjective well-being – is an essential assumption underlying a majority of sexual health interventions. However, we also found that women who were dissatisfied with their overall relationship not only did not exhibit this expected association, they actually reported *increased* distress in response to improvements in sexual function. These results, taken together with previous findings, suggest that the association between sexual function on the one hand and subjective sexual well-being on the other may me much more complex than previously assumed, and that understanding this association is an essential step in the effective and appropriate utilization of sexual health interventions.

While these initial studies have provided some information as to *when* sexual function is related to sexual distress, they do not answer an equally important question: *Why* aren't sexual function and distress correlated in many cases? There are two broad potential explanations for this disconnect. The first is that impaired sexual function *is* distressing in and of itself, but that a majority of women who experience impaired sexual function also exhibit protective factors that serve to decrease the degree to which the impaired function is distressing. In other words, impaired sexual function may be a universal and automatically aversive stimulus (such as intense pain), but most individuals are protected from this distress by other factors. For example, highly satisfying non-sexual aspects of romantic relationships may provide benefits that outweigh the negative aspects of sexual difficulties for some women, making impaired sexual function less distressing. A second possibility is that impaired function *is not* distressing in and of itself. Rather, it is possible that the secondary behavioral and/or cognitive consequences of impaired function can engender subjective distress, and that either A) these distressing consequences are only present in some cases of impaired sexual function, and/or B) these consequences are distressing to some individuals and not to others. For example, impaired sexual function may, in some cases, lead to negative partner reactions during sex such as sadness or frustration, and these partner reactions may be the source of distress for many individuals. These two explanations are not incongruent.

While a number of researchers have identified factors which may serve as protective factors to make impaired sexual function less distressing such as relational intimacy (Stephenson & Meston, 2010), older age (Rosen et al., 2009), and subjective importance

of sex (Hayes et al., 2008), we are not aware of any published studies that have attempted to outline specific immediate negative consequences of impaired sexual function that may serve as secondary mechanisms through which impaired sexual function causes distress. Indeed, researchers have noted that "research on specific patterns of interaction implicated in sexual dysfunction is scant. This stands in stark contrast to marital interaction research, which has identified several interactional patterns predictive of overall relationship satisfaction, marital stability, and divorce. The association between these patterns and sexual satisfaction or sexual function is unknown, as marital researchers have largely ignored sexual relationships of couples." (Moore & Heiman, 2006; pg. 79). Exploring the patterns of how impairments in sexual function play out, both intrapersonally and interpersonally in the context of coupled sexual activity, has the potential to explain the mechanisms through which impaired sexual function may impact the individual's level of distress. Such information regarding the potential negative consequences of impaired sexual function is relevant to a number of theoretical models of human sexuality.

For example, Barlow's model of sexual dysfunction (Barlow, 1986) guides much of the current treatment and research of sexual dysfunction. This model posits that individuals with sexual dysfunction tend to enter into a sexual situation with negative affect and expectancies and that their attentional focus is subsequently drawn to the "public consequences of not performing" (pg.146) or other non-erotic stimuli (e.g., body image concerns, external stressors, etc.). This focus on non-erotic stimuli during sexual activity is thought to increase anxiety and maintain low levels of arousal through

distraction, resulting in continued poor performance and later avoidance of erotic cues. Although this theoretical model forms the basis of much of modern sex therapy, there is very little research that specifically outlines the range of consequences of impaired function that takes place during or immediately following sexual activity. Indeed, while the initial model was noticeably focused on relatively de-contextualized internal processes (target of attention, performance concerns, etc.), more recent conceptualizations have noted that "contextual features of sexual interactions, both internal and external, largely determine a woman's overall experience during sexual activity, thereby increasing the potential for negative affect…" (Weigel, Scekowski, & Barlow, 2005; pg. 90). Additionally, recent empirical work on Barlow's model has highlighted the importance of the interpersonal consequences of impaired function (Nelson & Purdon, 2011), suggesting that distracting non-erotic thoughts may be driven in large part by these consequences. While these contextual features of sexual interactions hold the potential to increase our understanding of sexual dysfunction, the specific nature of these features remains unclear.

In addition to deepening our knowledge of one key aspect of Barlow's model, the distressing consequences of impaired sexual function may help explain the cyclical nature of the dysfunctional cognitive-behavioral cycle outlined in the model. As stated above, the initial component of Barlow's model that sets the dysfunctional cycle in motion is the individual's negative affect and expectancies upon entering a sexual situation. Given the natural reinforcers of sexual activity (physical pleasure, intimacy, etc.), it is logical to assume that such a negative stance in response to sexual activity must

be somehow actively maintained. In cognitive terms, such a negative stance could be maintained either by A) avoidance (either physical or experiential) of sexual activity, which would stop new learning regarding the potentially benign nature of sexual impairment from taking place, or B) by the continued experience of distressing outcomes when engaging in sexual activity (i.e., continued learning that the sexual impairments are *not* benign). Given that many women with impaired sexual function continue to engage in sexual activity with their partners, it is likely that these distressing consequences play a primary role in maintaining negative affect regarding sex in many cases. In sum, the specific negative consequences of impaired sexual function may represent a key mechanism for the maintenance of sexual difficulties, expanding beyond avoidance to explain the self-sustaining nature of the processes described in Barlow's model.

A second relevant theoretical model of sexual difficulties is the Dual Control Model proposed by Bancroft, Janssen, and colleagues (Bancroft, Graham, Janssen, & Sanders, 2009). This model posits that sexual desire and arousal are the result of two competing processes - sexual excitation and sexual inhibition - that are neurologically mediated by distinct physiological mechanisms. The authors of this model suggest that, while normal levels of sexual excitation and inhibition are adaptive, the inhibition system may be overly active in individuals with sexual dysfunction. This inhibition system may be activated by a number of factors, including the "negative emotional or interpersonal consequences" of sexual activity (pg. 122). Indeed, there is some empirical evidence that women with sexual difficulties tend to score highly on validated measures of sexual inhibition (Sanders, Graham, & Milhausen, 2008). But, while these measures do assess

potential negative consequences of sexual activity, the consequences are limited to A) being observed by others, B) contracting a sexually transmitted infection, C) becoming pregnant, and D) experiencing impairments in sexual function. It is likely that the range of sexual consequences that can activate inhibitory processes is wider than these four examples. While research on the Dual Control Model has focused on these long-term negative consequences of sexual activity, the immediate relational context of sexual activity is key for women (Petersen & Hyde, 2010) and immediate consequences of sexual activity that take place in this context may be just as important as long-term consequences.

Given the potential theoretical and clinical value, the general aim of the current study was to propose and test a model that describes the association between female sexual function and subjective distress that can account for the individual differences identified in earlier studies. The hypothesized contextual model incorporates elements of ecological and cognitive theories (Henderson, Lehavot, & Simoni, 2009; Sacco & Beck, 1995) (see figure below) and was arrived at using two primary assumptions. The first assumption, based on Beck's cognitive model, is that difficulties with sexual function are not necessarily distressing in and of themselves in that they are merely events in the world. The cognitive model suggests that events in the world do not cause negative emotional reactions; rather, it is the way in which these events are interpreted that determines the ultimate emotional outcomes. This assumption would seem to apply to difficulties with female sexual function, based on the fact that many women experience impaired sexual function without concurrent distress and unhappiness. Rather than

merely their presence or absence, it is likely that the degree to which these difficulties negatively impact well-being is dependent on A) their specific negative effects on the individual's sexual and/or interpersonal experiences, and B) the interpretations individuals make regarding their difficulties. As can be seen in the figure below, this conceptualization is similar to Beck's classic cognitive model wherein an activating event is interpreted in some way and it is this interpretation that gives rise to an emotional response

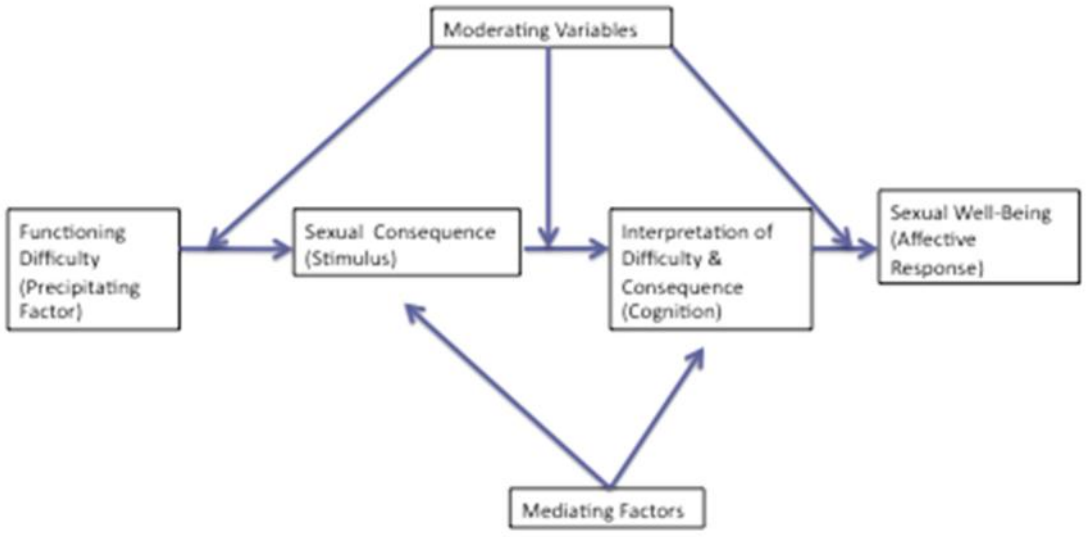

Figure 1: Working model of sexual difficulties affecting sexual well-being.

The second assumption of the model, based on an ecological conceptualization, is that sexual function impairments exist within a multi-faceted personal, interpersonal, and social context, and that factors related to the impairment itself (e.g. life-long vs.

acquired), the individual (e.g., attachment orientation), the relationship (e.g., emotional intimacy), and the social context (e.g., gender roles) can moderate each link in the chain from sexual function to consequence to interpretation to emotional outcome. Importantly, this means that the same impairment can have different consequences and be interpreted in different ways depending on the context within which the impairment exists. Additionally, specific consequences and interpretations may be more distressing for some individuals than for others. In sum, my working model posits that the link between difficulties with sexual function and sexual distress is mediated by the specific consequences of the difficulty and the individual's interpretation of these consequences, with both consequences and interpretations being determined by contextual moderating factors.

Based on pilot work, clinical case studies (e.g., Leiblum, 2007), clinical experience, and consultations with professional sex therapists, we included four primary categories of negative sexual consequences in the current study that could take place during or immediately following sexual activity: decreased pleasure (for self or partner), increased discomfort (for self or partner), disruption/prevention of sexual activity, and negative partner reactions. Decreased pleasure and disruption of sexual activity are logical potential consequences of some sexual impairments. For example, a lack of adequate vaginal lubrication can result in irritation to the labia during attempted penetration and this irritation can be painful enough to disrupt sexual activity. Other sexual consequences, such as negative partner responses, do not necessarily follow logically from impaired sexual function, i.e., there is nothing inherent in the functioning

difficulties that would lead to negative partner reactions. However, in clinical practice, it is often these responses that cause a couple to seek treatment. Indeed, the DSM-IV-TR includes "interpersonal difficulties" as one of its criteria for sexual dysfunction (APA, 2000) specifically to account for the fact that it is often the sexual partner's response that is most distressing to the individual.

Although a partner may respond to a sexual function impairment in many ways, four general categories of responses were included in the current study: negative reactions towards the individual experiencing the impairment, negative reactions towards his/herself, negative reactions towards the relationship, and general sadness/dissapointment. According to participants in a pilot study (see below), these categories of partner reactions adequately captured their range of sexual experiences, though there are likely finer distinctions that can be drawn in future research.

The second type of mechanism assessed in the current study was the ways in which impaired sexual function can be interpreted. In the current research, we focused on a type of interpretation that has received attention from both marriage and sexuality researchers: *causal attributions,* or the perceived causes of events. In the field of sexuality, causal attributions have primarily been studied in the context of Barlow's model of sexual dysfunction (Barlow, 1986). Recall that Barlow's model posits that individuals with and without sexual dysfunction respond differently to sexual stimuli. Those with dysfunction tend to approach a sexual situation with negative affect, negative expectancies, and a lack of perceived control whereas those without dysfunction approach sexual situations with positive affect, positive expectancies, and high perceived

control. A more recent component of Barlow's model is the hypothesis that, for men, this difference in ways of approaching sexual situations is the result of individual differences in attributional style regarding an initial experience of a difficulty with sexual function. In support of this hypothesis, studies have found that men with sexual dysfunction are more likely to make internal and stable attributions regarding their sexual function difficulties (Fichten, Spector, & Libman, 1988; Peterson et al., 1982) while men without sexual dysfunction (of whom up to 90% experience occasional difficulties attaining or maintaining erections; Carter & Sokol, 1989), are more likely to identify external factors to explain impaired sexual function. In fact, experimentally inducing an internal, stable attributional style towards erectile difficulties can result in poorer subsequeny erectile response (Weisberg, Brown, Wincze, & Barlow, 2001).

While this work suggests that sexual attributions play an important role in male sexual dysfunction, it is limited in a number of ways. The first and most obvious is that the framework has not been expanded to women. The second is that, while attributions have been tested as a correlate and possible etiological factor in impaired physiological arousal, the association between attributions and affective factors like distress has received relatively little attention. Third, Barlow and colleagues have studied a relatively restricted range of attributions. Specifically, their Attributional Style Questionnaire (ASQ; Peterson et al., 1982) measures only three types of attributions: internality, stability, and globality. The current study addressed each of these limitations by expanding research on sexual attributions to women, exploring the association between

sexual attributions and subjective distress, and expanding the range of attributions studied.

Causal attributions have long been a target of research in the area of marital satisfaction. Of specific interest is the work of Thomas Bradbury and his colleagues who have performed a number of studies examining the nosology and impact of attributions regarding the causes of relational conflicts. In a seminal review, Bradbury and Fincham (Bradbury & Fincham, 1990) suggested that the attributions partners make regarding the causes of interpersonal conflicts tend to fall along the primary dimensions of locus, stability, control, and specificity. Locus refers to the location of the cause, namely whether it resides primarily within the individual, within his/her partner, or in some external factor (note that this is more nuanced than Barlow's dichotomy of internal vs. external causes). Stability refers to whether the cause of the conflict is likely to be long-lasting or transient. Control refers to how much control an individual has over the cause of the conflict. And specificty refers to whether the cause of the conflict is specific to the content of the conflict or whether it is indicative of wider issues in the relationship. Additionally, Bradbury and others (e.g., Brewin & Antaki, 1987) have suggested that attributions regarding responsibility and blame should be measured as distinct from other causal attributions. For example, assuming that a relational partner is at least somewhat responsible for a conflict, this responsibility can differ in terms of control (the degree to which he/she could have helped causing the conflict), intent (whether he/she caused the conflict on purpose), and blame (the degree to which he/she deserves to be blamed for the conflict). Barlow's measurement of sexual attributions does not include these aditional

categories, which may be especially important in the context of ongoing sexual relationships.

Each of these types of attributions has been shown to be associated with martial satisfaction in a number of studies and a validated measure encompasing all of these attributions is available: the Relational Attribution Measure (RAM, Bradbury & Fincham, 1992). Although sexual difficulties are not strictly analagous to relational conflict, they can likely be interpreted along these same dimensions. For example, anorgasmia can be interpreted as stemming from personal failings or partner ineptitude and the partner can be seen as having a greater or lesser degree of control over his/her level of sexual skill. By using a measure of sexual attributions based on the RAM, the current study assessed how a wide range of sexual attributions were associated with sexual distress for the first time. My hypothesis was that sexual function would be more closely associated with sexual distress to the degree that the causes of impaired function were interpreted as internal to the individual, permanent, and general in the relationship, and when one's partner was interpreted as being responsible for the functional impairment, in control of his/her influence, intending to have this effect, and worthy of blame.

In addition to evaluating the mediating effects of sexual consequence and attributions, the current study was also meant to expand past research on moderators of the association between sexual function and distress. As stated above, one of the key assumptions of my contextual model is that the same impairment in sexual function can result in different consequences and be interpreted in different ways depending on contextual moderating factors. These moderating factors are likely numerous and exist at

multiple levels of environmental systems. The first, most proximal level is made up of factors related to the sexual impairment itself, including severity, and whether the impairment is lifelong vs. acquired, general vs. situational, or due to psychological factors vs. due to combined factors. Depending on which category sexual impairments fall under, they may have different consequences and/or be interpreted in different ways. For example, if a difficulty is situational as opposed to general (e.g., occurs only in the context of partnered sexual activity), the individual may be more likely to interpret the cause of the difficulty as his/her partner, an interpretation that is likely more distressing than an interpretation of the cause as external to the relationship.

The second group of contextual moderators are those at the person level. These include individual differences that may make impaired sexual function more or less distressing by altering their consequence and/or interpretations. While some of these factors can be relatively constant (e.g., gender, attachment style, personality), others can change over time (e.g., age, psychopathology). In current study, three individual-level moderators were assessed: history of childhood sexual abuse, attachment orientation, and age. Each of these have been identified as a moderator of the association between sexual function and sexual distress in earlier studies (Stephenson et al., 2012; Stephenson & Meston, 2010; Stephenson & Meston, 2012).

The third group of moderators are those at the interpersonal relationship level. Factors at this level include both those related to the sexual partner (e.g., sexual knowledge, coping style) and of the relationship (e.g., level of intimacy, communication, length). In the current study, we assessed relational satisfaction. Relational satisfaction

has been defined in a number of ways, with at least 15 validated measures available (Karney & Bradbury, 1995). The most commonly used measure is the Dyadic Adjustment Scale (DAS, Spanier, 1976). However, a number of researchers have raised the issue that the DAS was never meant to measure *satisfaction*, but rather the more abstract and encompassing construct of *adjusment* (Eddy, Heyman, & Weiss, 1991), which overlaps with a number of other factors that are distinct from satisfaction such as communication and conflict style. As such, in the current study, I use the term relational satisfaction to refer specifically to global sentiments regarding the relationship rather than specific aspects of the quality of the relationship. Relational satisfaction has been identified as a moderator of the association between sexual function and sexual distress in an earlier study (Stephenson, et al., 2013).

The fourth group of moderators involve those at the level of wider social context. This level would include factors such as social norms for sexual activity and function, gender roles, and the availability of treatments for sexual dysfunction. The current research did not include factors from this level due to the fact that there is no foundational research from which to form hypotheses. However, the cultural context of sexual dysfunction will likely be an important target of future research.

While fully exploring each of these moderators is far beyond the scope of the current project, I selected a number of limited goals. First, I attempted to replicate previous findings regarding moderators of the association between sexual function and distress using a sample that includes both participants with and without diagnoses of sexual dysfunction. Second, I attempted to extend previous findings by testing mediated

moderational models wherein the moderational effect of these factors is accounted for by differences in medational factors (consequences and attributions). For example, testing whether the moderating effect of attachment anxiety (wherein sexual function difficulties are more strongly associated with distress for anxiously attached women) is no longer present when accounting for sexual attributions.

In sum, my working contextual model of sexual difficulties provided an initial framework within which to examine how a number of diverse factors are associated with sexual function, sexual distress, and the link between the two. The overall goal of the current study was to provide an emperical basis for this model, thereby increasing our knowlede as to when and why difficulties with sexual function are distressing to women. To achieve this overarching goal, I had a number of more specific goals:

Goal 1: *Establish the psychometric properties of a revised measure of sexual consequences and attributions.*

To effectively assess the roles of sexual consequences and attribution in FSD, it was necessary to create and validate a measure of these factors.

Goal 2: *Test cross-sectional mediational models*

My primary hypothesis in the current study was that impaired sexual function would affect distress levels because of its consequences and associated interpretations. I tested this hypothesis using indirect effects models, also known as meditational models. The first iteration of this process involved the use of cross-sectional models.

Goal 3: *Test a series of mediated moderational models to determine if previously identified moderational effects are acounted for by differences in sexual consequences and/or attributions.*

My hypothesis was that previously identified interaction effects would be replicated, and that these interaction effects would be explained by sexual consequences and attributions.

Goal 4: *Estimate event-level associations between sexual consequences/attributions and distress and the variance of these associations.*

Assessing the intra-individual association between factors over time provides higher quality evidence than cross-sectional correlations of possible causative relationships.

Goal 5: *Test a multi-level mediational model*

To strengthen my confidence in the findings from goal 2, I assessed indirect effects in the context of multi-level, repeated measures data, which allowed me to test the entire mediational pathway within individuals over time.

PILOT WORK

Before conducting the current study, I completed a pilot study using a preliminary version of the Measure of Attributions and Sexual Consequences (MASC). For this study, I recruited 24 female participants in romantic relationships that reported at least one impairment in sexual function in the past year. Eleven of the women were being treated for a DSM-IV-TR diagnosed sexual dysfunction. Thirteen of the women had not been diagnosed with sexual dysfunction, but reported impaired sexual function. A majority of the participants in each group were undergoing physical therapy and were recruited via e-mails from their physical therapy clinic. Participants filled out an anonymous online

survey, which included the Female Sexual Function Index (FSFI; Rosen et al., 2000), the Sexual Satisfaction Scale for Women (SSS-W; Meston & Trapnell, 2005), the Relationship Assessment Scale (Hendrick, Dicke, & Hendrick, 2002), and the MASC. The MASC assessed a range of sexual consequences and sexual attributions. First, participants were instructed to rate how often their sexual difficulties (self-defined impairments in desire, arousal, lubrication, orgasm, and/or sexual pain) resulted in three broad categories of consequences.

Self-oriented consequences - those directly detrimental to one's own sexual experience, included:

1. Decreased pleasure for self
2. Disruption of sexual activity (having to stop before one or both partners would like)
3. Decreased frequency of sex (having sex less often)

Partner response consequences - those related to the partner's reactions, included:

1. Partner expressing negative emotions towards him/herself (e.g., decreased self-esteem, anger towards self)
2. Partner expressing disappointment and/or sadness
3. Partner expressing frustration/anger towards the individual experiencing the sexual difficulty
4. Partner expressing doubts about the sexual relationship
5. Partner pressuring the individual to engage in sexual activity more often than she would like

Partner-oriented consequences - those primarily affecting the partner's sexual experience, included:

1. Decreased partner pleasure
2. Increased partner discomfort
3. Decreased partner interest in sexual activity

Second, participants were asked to consider their beliefs regarding the causes of their sexual difficulties and rate them along a number of continua.

Locus attributions included:

1. To what degree the causes are internal to the individual
2. To what degree the causes are internal to the individual's partner
3. To what degree the causes are external to the individual and her partner

Globality attributions included:

1. To what degree the causes are specific to sexual activity
2. To what degree the causes are global to the relationship

Stability attributions included:

1. To what degree the causes are stable (vs. transitory)

Control attributions included:

1. To what degree the causes are under the individual's control
2. To what degree the causes are under the partner's control

Partner intent attributions included:

1. To what degree the partner purposefully affects the individual's sexual function
2. To what degree the partner's intent was positive (vs. negative)

Blame attributions included

1. To what degree the partner deserved to be blamed for the sexual difficulties
2. To what degree the individual deserved to be blamed for the sexual difficulties

The goals of this pilot of the MASC were A) to assure that questionnaire items were clear to a lay-sample, B) to determine whether items accurately captured women's sexual experiences, C) to gather information on the central tendency and variation of individual items, and D) to assess the strength of association between items of the MASC and sexual function, sexual distress, and sexual satisfaction.

Goal A

I included a number of free response items in the pilot survey asking women to comment on confusion they felt regarding the items and if they had suggestions for additional items. Responses were generally positive and no confusion was noted. One helpful suggestion was to split the first locus attribution item into two items, one assessing the degree to which the cause is internal to the individual and *psychological*, and one assessing the degree to which the cause is internal to the individual and *physical*. This is a potentially important distinction and these new items were included in the final study.

Goal B

My next aim was to assure that each consequence was reported to some degree and that each exhibited some variability in the sample, i.e., I wanted to insure that no consequences were included which were never reported, or reported at the same rate across all individuals. All consequences were reported at least rarely by some participants. Additionally, all of the consequences exhibited substantial variability,

sometimes reported as rare and sometimes reported as frequent. Attribution items also showed substantial variability across the sample. One exception was the partner blame item. For this item, only three participants responded with anything other than a one on a six point scale (partner deserves no blame).

Goal C

One basic assumption of my working model is that poorer sexual function should be associated with greater frequency of sexual consequences. The initial pilot data supported this assumption, with every consequence exhibiting a significant correlation with at least one aspect of sexual function. In general, the strength of association between consequences and sexual function ranged from .2 to .6. Importantly, these associations showed interpretable patterns. For example, we would assume that, in heterosexual relationships, difficulties with lubrication would be more likely to lead to negative partner-oriented consequences (e.g., decreased pleasure, increased discomfort for the partner) than would problems with orgasm which should have little direct impact on the partner's physical sensations. My data supported this difference, with lubrication exhibiting stronger correlations with partner-oriented consequences as compared to orgasm:

FSFI Subscale	Less Partner Physical Pleasure	Partner Physical Discomfort	Partner Decreased Interest
Orgasm	-.19	.07	-.20
Lubrication	-.50*	-.43*	-.50*
* p<.05			

Table 1: Orgasm vs. lubrication – association with sexual consequences.

Another assumption of the research is that these negative consequences are tied to sexual distress and satisfaction, and that there is inter-individual variation in the strength of this association. My pilot data suggested that a majority of the consequences were tied to both satisfaction and distress. For example, decreased sexual frequency and decreased partner pleasure exhibited moderate to strong association with sexual distress and satisfaction:

	Sexual Satisfaction	Relational Concern	Personal Concern
Decreased Sexual Frequency	-.71**	-.37	-.45*
Decreased Partner Pleasure	-.74**	-.52*	-.33
* p<.05; ** p<.01			

Table 2: Decreased sexual frequency vs. decreased partner pleasure – association with subjective well-being.

Additionally, even for consequences that were more weakly tied to satisfaction and distress on average, I found substantial inter-individual variability, suggesting the presence of important moderators of the association between the consequence and well being. For example, partner frustration/anger was weakly tied to sexual well-being on average:

	Satisfaction	Relational Concern	Personal Concern
Partner frustration/anger	-.15	-.51*	-.12
* p<.05; ** p<.01			

Table 3: Association between partner frustration/anger and subjective well-being.

However, when explicitly asked to rate how distressing this consequence is on a scale from 1 (not distressing at all) to 5 (extremely distressing), it was clear that there was a subset of individuals who found this consequence very distressing, and another subset who found it minimally distressing:

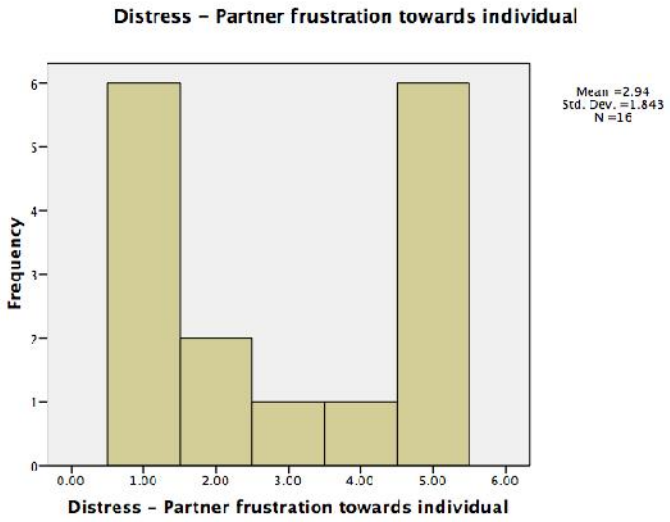

Figure 2: Ratings of distress regarding partner anger/frustration.

It is less appropriate to correlate individual attribution items with distress and satisfaction as past theorists have suggested that it is the pattern of attributions rather than individual attributions that shape affective responses (Bradbury & Fincham, 1990). For example, in the pilot sample, the single item assessing the degree to which causes were seen as external to the individual was weakly associated with sexual satisfaction (r =.23, *ns*). However, when the three locus items were combined into a locus subscale, with higher scores indicating beliefs that the causes of sexual difficulties were less internal to the individual and her partner and more external, the subscale score was more strongly

associated with sexual satisfaction (r = .65, p < .01). However, it is important to note that a number of individual attributions and subscale scores were relatively weakly tied to reported well-being, especially stability (r = .06 and .22 for satisfaction and personal distress respectively). Given the small sample size, this weak association may have been caused by chance. However, it will be important to assess the usefulness of this item given a larger and more diverse sample.

Chapter 2: Methods

PARTICIPANTS

Participants were recruited through two primary means: advertisements aimed at the general public, and targeted recruitment undertaken by sexual health care providers. Public advertisements included a combination of flyers and online advertisements posted on community websites such as craigslist.org. Individuals making general inquiries about studies conducted at the Sexual Psychophysiology Laboratory were also extended the opportunity to participate if they met inclusion criteria (below). In addition, general information about the study was made available on the Meston laboratory web site, www.mestonlab.com.

All public advertisements provided basic information about inclusion criteria and the time commitment involved in the study. Participants were able to obtain further information by visiting the laboratory web site or by telephoning the laboratory. Participants who expressed interest in the study were screened by telephone for inclusion and exclusion criteria. Women who were eligible and willing to participate were scheduled for an initial visit, which took place in the Sexual Psychophysiology Laboratory, at which time they were given full information about the study and provided informed consent.

Participants were also recruited through sexual health care providers in the community including the Austin Center for Women's Sexual Health (ACWSH; www.miaustin.com/), Sullivan Physical Therapy (www.sullivanphysicaltherapy.com/), and the Women Partners in Health Center (http://www.wpih.net/public_html/), along

with a number of sex therapists in private practice. All centers and therapists reviewed and approved the study procedures and agreed to be involved in recruitment. To avoid overlap with active treatment, providers informed potential patients of the opportunity to participate in a paid research study during their initial contact calls. Providers outlined basic information about selection criteria and the time commitment involved in the study and asked potential participants for their consent to send their contact information to the principle investigator. Health providers clearly informed participants that their participation, or lack thereof, in the study would in no way affect their treatment and that the research was being performed through the University of Texas, *not* their treatment provider. Women who expressed interest in participating were contacted within 48 hours and screened over the phone by a trained research assistant to assure that they meet inclusion criteria and be scheduled for an intake assessment.

Unfortunately, despite continued willingness to aid the research process, participant referral from sexual health providers was minimal, with a total of 6 participants in the study coming from these sources over 12 months of recruitment. Upon consultation with these providers, it seemed clear that the time necessary for recruitment was overly burdensome. However, this difficulty did not result in a lack of participants meeting DSM-IV-TR criteria for sexual dysfunction (see below).

Women were eligible to participate in the study if they met the following criteria:

1. *Age 18 or older*. Due to the sexual nature of the study, only adults were recruited.

2. *Currently in a monogamous, heterosexual relationship*. As a number of the factors of interest involve relational partners, participants needed to be involved in a romantic relationship. Also, as some measures (relational satisfaction and intimacy) referred to a specific relationship, it would be difficult to identify one relationship as "primary" for women engaged in multiple sexual relationships.
3. *Regular access to internet*. As a majority of the study measures were completed online, it was necessary for participants to have access to the internet.
4. *Currently sexually active and willing to attempt sexual activity during the study*. One of the primary goals of the proposed research was to examine intra-individual changes in sexual experience over time. As such, women who were not currently sexually active would not be able to provide the necessary data. Sexual activity included vaginal intercourse, oral sex, anal sex, and petting (manual sex). An "attempt" was defined in the current study as genital contact by the partner with the intention of inducing pleasure.
5. *Fluent in English*. Most of my measures were available only in English; suitable alternatives were not available.
6. *Impaired sexual function.* Given the goals of the current study it was necessary that all participants were experiencing impairments in sexual function to one degree or another, however, it was also necessary to include both distressing and non-distressing cases of impaired sexual function in the

study sample. As such, all participants needed to report that they had been experiencing low sexual desire or arousal, difficulty reaching orgasm, and/or pain during sexual activity in the past month, but did not need to report significant distress regarding these impairments.

Potential participants were excluded based on the following criteria:

1. *Factors that put participant at risk of physical harm as a result of sexual activity*. Women were excluded from the study if they had been informed by a medical professional that they were not healthy enough to engage in sexual activity.
2. *Self-report of an untreated serious mental health condition.* This included untreated bipolar disorder or schizophrenia.
3. *Sexual Aversion / Sexual Phobia*. Women who reported phobic aversion to sexual activity were excluded from the study.
4. *Any other medical or psychiatric condition which, in the opinion of the investigator or participant, would put the participant at risk and preclude participation in the study*.

Ninety women attended an intake assessment. Of these, three were excluded – one because it became clear over the course of the intake interview that she was experiencing undiagnosed manic symptoms. A second individual was excluded because she was in a relationship with a married man (a qualitatively different relational dynamic than other participants in the study). Lastly, one was excluded because it became clear that she was not literate enough to fully understand the written questionnaires used in the study.

These exclusions resulted in a final sample of 87 women. The average age of participants was 27.44 years (SD=6.74), with an average relationship length of 45.60 months (SD = 63.38 months). Twenty three (26.4%) participants were married and the remaining were in a monogamous sexual relationship. Two (2.3%) participants had a high school diploma only, 27 (31%) had completed some college, 35 (40.2%) had completed an undergraduate degree, and 23 (26.4%) had completed an advanced degree. Seventy participants (80%) identified as Caucasian, 12 as Latino (14%), 5 as African American (6%), and 6 as Asian American (7%). Twenty four (27.6%) participants reported a history of childhood sexual abuse and 9 additional participants reported adult sexual assault only. Thirty nine (44.8%) participants reported a past mental health diagnosis, primarily mood and anxiety disorders.

Fifty two participants reported low sexual desire; of these 31 (59.6%) met criteria for Hypoactive Sexual Desire Disorder (HSDD). Forty seven participants reported low subjective arousal; of these 21 (44.7%) met criteria for Female Sexual Arousal Disorder (FSAD) -subjective subtype. Fifty participants reported impaired genital lubrication; of these 13 met criteria for FSAD-physiological subtype (26%). Seventy participants reported difficulty reaching orgasm; of these 27 (38.6%) met criteria for Female Orgasmic Disorder (FOD). Forty seven participants reported difficulties with sexual pain; of these 17 (36.2%) appeared to meet criteria for dyspareunia or vaginismus (8 were

likely vaginismus)[2]. Thirty four participants (39.1%) reported likely partner sexual dysfunction including premature ejaculation, erectile dysfunction, and low sexual desire.

A clinical cutoff of 26.5 has been established for the FSFI (Wiegel, Meston, & Rosen, 2005), with scores below this point being indicative of likely sexual dysfunction. As would be expected, the average score of 22.63 in the current sample was below this point. More specifically, 75.8% (N=66) of the sample scored below this cutoff. Of the participants given any FSD diagnosis (N=57), only three (5.3%) scored above 26.5. Of the participants not given any FSD diagnosis (N=31), 58.6% (N= 18) scored above this cutoff[3].

PROCEDURES

Women agreeing to participate attended a clinical intake interview at the Sexual Psychophysiology Lab on The University of Texas campus where they provided informed consent, answered questions regarding their sexual and relational experiences, and completed a number of online self-report measures (see Measures). One portion of this intake was a face-to-face semi-structured interview to assess for sexual dysfunction based on DSM-IV-TR criteria performed by the Principle Investigator. This interview included questions assessing each aspect of sexual function (desire, arousal, orgasm, and pain), the impact of sexual difficulties on the participant's life, and any resulting distress. Participants were categorized as meeting criteria for sexual dysfunction if A) they

[2] Diagnosis of both of these conditions requires a physical examination, which was beyond the scope of the current study. As such, these diagnoses should be considered very tentative.

[3] These percentages suggest A) that we effectively sampled both women with and without diagnosable FSD, and B) that the diagnostic labels provided by the PI were fairly accurate.

reported significantly impaired sexual function[4], B) they reported significant distress regarding this impaired sexual function, and C) this distress was not only limited to frustration during sexual activity, rather, that the sexual impairment had a significant impact on the individual's overall quality of life and/or romantic relationship. Additional questions assessed current frequency of sexual activity with partner, occurrence of any current or previous abuse in the relationship, and past sexual experiences including history of sexual dysfunction, and history of sexual abuse.

For four weeks after the initial session, participants completed daily online measures regarding their sexual experiences, including any instances of attempted vaginal penetration, oral sex, and petting (manual genital stimulation) involving both partners[5]. Participants were asked to engage in sexual activity with their partner at a frequency that was comfortable to them, however, participants were encouraged to attempt to engage in sexual activity at least 5 times during the month of being assessed. Each day, participants reported on their level of sexual desire, sexual consequences and attributions, and sexual satisfaction/distress. On days where sexual activity took place, participants also reported their level of sexual arousal, the occurrence of orgasm, and the occurrence of any sexual pain. Participants received daily e-mail reminders to complete their measures.

[4] In the current study, the following loose criteria were used to define impairments in sexual function: sexual desire less frequently than 2 days in a typical week and lower than the individual would like, adequate subjective or genital arousal during less than 50% of sexual episodes and lower than the individual would like, reaching orgasm in less than 25% of sexual episodes, or taking over 45 minutes to reach orgasm, experiencing pain rated higher than a 4 out of 10 during 25% or more of sexual episodes.

[5] We also tracked instances of masturbation. However, as many of the items of the MASC and the outcome measures explicitly include the relational partner, experiences surrounding masturbation were not of primary interest.

All daily diary data was collected online using surveymonkey.com, which allowed me to confirm the time and date of completion (to assure that measures were completed daily). Participants received $1 a day for completing daily assessments and a $1 a week bonus for completing all seven days, allowing participants to earn up to $32 over the course of the study. Participants who did not attempt sexual activity during the first 14 days of the study (N=6) were sent a reminder e-mail that engaging in sexual activity was a necessary component of participation. Four participants discontinued their participation prior to completing four weeks of daily measures because their romantic relationships ended. At the conclusion of four weeks, participants were provided with compensation and with referral information for a number of sexual health care providers in the local community.

Intake Measures

Female Sexual Function Index (FSFI)

The FSFI is a 19-item questionnaire that is subdivided into 6 domains: desire, mental arousal, physical arousal (lubrication), orgasm, satisfaction, and sexual pain. The FSFI has been shown to differentiate between women with and without female sexual arousal dysfunction (Rosen et al., 2000) female orgasmic disorder, and hypoactive sexual desire disorder (Meston, 2003). All domains have acceptable internal consistency (Cronbach's α = 0.95), inter-item reliability (Cronbach's α = 0.82 - 0.92) and test-retest reliabilities during a four-week interval (Pearson's r = 0.85). Divergent validity has been established using the Locke-Wallace Marital Adjustment Test. Cronbach's alpha in the

current sample was .93 for desire, .99 for arousal, .94 for lubrication, .89 for orgasm, .88 for satisfaction, and .87 for pain.

Sexual Satisfaction Scale for Women (SSS-W)

The SSS-W (Meston & Trapnell, 2005) is a 30-item self-report measure of female sexual satisfaction that provides scores on three domains of sexual satisfaction and two of sexual distress, as well as a total score. The domains assessed have been confirmed using factor analyses and include: contentment, communication, compatibility, relational concern, and personal concern (each with 6 items). The SSS-W full-scale score and each of the domain scores have been shown to reliably discriminate women with sexual dysfunction from age-matched controls. Internal consistency and test-retest reliabilities are within the acceptable range. In the current study, the personal concern subscale was used as the primary measure of sexual distress. Cronbach's alpha in the current sample was .83.

Couples Satisfaction Index (CSI)

As mentioned above, while the DAS is the most commonly used measure of relational satisfaction, serious concerns have been raised regarding the appropriateness of interpreting the measure assessing global satisfaction with the relationship. Funk and Rogge (2007) have recently created a new measure that includes components of the DAS, and well as items from other validated measure of relational satisfaction (e.g., Locke & Wallace, 1959). Analyses suggest that this new scale is a more precise measure of relational satisfaction than previously used scales and, thus, should provide for increased statistical power. The CSI has three forms made up of 4, 16, or 32 items. Each form has

been shown to reliably differentiate distressed form non-distress couples and shows excellent concurrent validity with other scale of relational satisfaction. In the current study, we used the 16-item measure, which measures global aspects of relational satisfaction and has been shown to be highly correlated with the full 32-item measure (r = .99) in the initial validation study (Funk & Rogge, 2007). Cronbach's alpha in the current sample was .98.

Measure of Attributions and Sexual Consequences (MASC)

The MASC is a newly created 24-item questionnaire assessing the consequences of impaired sexual function and an individual's attributions regarding the causes of her sexual impairments. The measure includes three categories of sexual consequences: consequences related to one's own sexual experience, consequences related to the partner's sexual experience, and negative partner reactions. The measure also includes six categories of causal attributions: locus, stability, globality, control, partner intention, and blame. Although still in the validation stage, initial pilot data (see above) suggested that items of the SCAM were associated with both sexual function and sexual well-being. See Results section for additional information regarding the reliability and validity of this scale.

Experiences in Close Relationships Scale – Revised (ECR-R)

The ECR-R (Sibley, Fischer, & Liu, 2005; Sibley & Liu, 2004) is a 12-item measure of adult attachment orientation. Although there has been debate as to the appropriateness of using self-report scales to measure attachment orientation (Mikulincer & Shaver, 2003), the ECR-R has been shown to be one of the most reliable and valid

measures of this type, exhibiting excellent psychometric properties and explaining between 30% and 40% of variation in ratings of attachment-related emotions experienced during interactions with a romantic partner (Sibley et al., 2005). Additionally, this scale is recommended for use when attachment is to be utilized in moderation analyses, making it appropriate for use in the current study (Sibley et al., 2005). Cronbach's alpha in the current sample was .86 for attachment anxiety and .71 for attachment avoidance.

Trauma History Questionnaire (THQ)

Incidents of childhood sexual abuse were assessed using the THQ (Green, 1996), a 24-item self-report measure used to examine physical and sexual traumatic experiences. Questions on the THQ are in a yes/no format, and when a respondent endorses a question, he/she is asked to provide her age at the time of the event and the event's frequency, as well as the nature of relationship with person (stranger, friend, relative, parent, sibling) and the nature of the abuse (penetrative or non-penetrative). The THQ has demonstrated test-retest reliability coefficients between .54 and .92 over a two to three month period (Norris & Hamblen, 2004). In the current study, we included the items related to sexual and physical abuse only.

Daily Measures

Sexual Function

Daily measures of sexual function consisted of the most representative items of function subscales from the FSFI. Desire, arousal, lubrication, orgasm, and pain were measured on a continuous scale with responses ranging from low to high.

Sexual Consequences

Event-level sexual consequences were identical to those measured at intake. Participants were asked to report the degree to which each consequence occurred during the sexual episode.

Sexual Attributions

Event-level sexual attributions were measured in the same way as general attributions, with the exception that participants rated episode-specific causes of the sexual impairment experienced that day (rather than the causes of their sexual impairments in general). A number of attribution items were not included in the daily measure given their severely skewed distribution in pilot research. Specifically, items assessing partner intent and blame for the individual and her partner were not included in daily measures.

Sexual Satisfaction

Daily sexual satisfaction was measured with a single item: "How satisfied have you been with your overall *sexual life* today?"

Sexual Distress

Daily sexual distress was measured using two items, one assessing relational distress ("I feel like my sexual difficulties today adversely affected my relationship") and one assessing personal distress ("My sexual difficulties today were distressing to me personally").

Life Satisfaction

Daily life satisfaction was measured using a single item: “Overall, I am satisfied with life today.” The life satisfaction daily measure was rated on a 7-point scale; all other daily items used 5-point scales.

Variable: Mean (SD)	Sexual Distress	Sexual Function	Sexual Desire	Sexual Arousal	Lubrication	Orgasmic Function	Sexual Pain
Sexual Distress: 15.75 (5.26)	1	.443**	.346**	.604**	.247*	.247*	.052
Sexual Function: 19.04 (4.46)		1	.679**	.781**	.765**	.392**	.546**
Sexual Desire: 3.31 (1.40)			1	.534**	.360**	.091	.233*
Sexual Arousal: 3.69 (1.29)				1	.472**	.274*	.265*
Lubrication: 4.24 (1.50)					1	.149	.438**
Orgasmic Function: 3.20 (1.51)						1	-.246*
Sexual Pain: 4.66 (1.42)							1
Relational Satisfaction: 59.99 (16.26)							
Life Satisfaction: 22.84 (7.41)							
Attachment Avoidance: 14.64 (8.15)							
Attachment Anxiety: 23.11 (7.65)							
Sexual Consequences: 24.74 (7.93)							
Sexual Attributions Factor 1 - Partner Causes: 7.98 (3.73)							
Sexual Attributions Factor 2 - Personal Causes: 10.47 (3.67)							
Sexual Attributions Factor 3 - Medical Causes: 12.05 (2.76)							
*** p<.001; ** p<.01; * p<.05							

Table 4: full caption, next page

Variable	Relational Satisfaction	Life Satisfaction	Attachment Avoidance	Attachment Anxiety	Sexual Consequences	Sexual Attributions Factor 1	Sexual Attributions Factor 2	Sexual Attributions Factor 3
Sexual Distress	.339**	.425**	-.324**	-.115	-.555**	-.264*	-.346**	-.100
Sexual Function	.111	.188	-.136	.106	-.454**	.119	-.156	-.309**
Sexual Desire	-.039	.024	.089	.186	-.513**	.143	-.299**	-.267*
Sexual Arousal	.219*	.225*	-.163	-.052	-.524**	-.058	-.152	-.190
Lubrication	.014	.076	-.048	.150	-.272*	.051	-.068	-.214
Orgasmic Function	.195	.256*	-.248*	-.156	.034	.021	-.095	.081
Sexual Pain	-.068	.082	-.006	.084	-.203	.162	.073	-.380**
Relational Satisfaction	1	.426**	-.597**	-.329**	-.343**	-.516**	-.062	.156
Life Satisfaction		1	-.427**	-.242*	-.187	-.186	-.297**	.139
Attachment Avoidance			1	.132	.241*	.478**	.159	-.233*
Attachment Anxiety				1	-.073	.303**	.220*	-.214*
Sexual Consequences:					1	.200	.320**	.175
Sexual Attributions Factor 1 - Partner Causes						1	.209	-.320**
Sexual Attributions Factor 2 - Personal Causes							1	-.279*
Sexual Attributions Factor 3 - Medical Causes								1
*** p<.001; ** p<.01; * p<.05								

Table 4: Correlation matrix for all intake measures.

Chapter 3: Results

GOAL 1: ESTABLISH THE PSYCHOMETRIC PROPERTIES OF A REVISED MEASURE OF ATTRIBUTIONS AND SEXUAL CONSEQUENCES

Descriptive statistics, including mean and standard deviation were computed for each item of the MASC. Normality statistics such as skewness and curtosis were also assessed and any indications of non-normality are noted in the table below. Internal reliability (using Cronbach's alpha) was also computed.

Consequence	Mean Frequency	SD	Number reporting	% reporting	Notes regarding normality
Less Pleasure	3.76	1.08	86	0.99	
Sex Disrupted	2.36	1.16	63	0.72	
Decreased Frequency of Sex	3.28	1.44	72	0.83	
Partner Sadness	2.52	1.19	67	0.77	
Partner Less Pleasure	2.38	1.26	49	0.56	
Partner Negative Emotions Towards Self	2.18	1.17	56	0.64	Positively skewed, skewness = 2.96 SE
Partner Anger	1.51	1.51	28	0.32	Positively skewed, skewness = 6.30 SE
Partner Relational Doubts	1.55	1.55	25	0.29	Positively skewed, skewness = 6.31 SE
Partner Decreased Pleasure	2.43	1.26	60	0.69	
Partner Discomfort	1.43	0.76	25	0.29	Positively skewed, skewness = 6.62 SE
Partner Less Desire	2.01	1.18	46	0.53	Positively skewed, skewness = 3.42 SE
Partner Pressure to Have Sex	1.88	1.25	36	0.41	Positively skewed, skewness = 4.42 SE
Total Consequences	24.74	7.93			
Cronbach's Alpha for Consequences	.85				

Table 5: Descriptive statistics for consequences items of MASC.

As can be seen, each consequence was reported to some degree by at least a quarter of the sample. However, a number of the individual consequences were positively skewed, with relatively few participants reporting outcomes such as partner discomfort and anger as frequent consequences of their impaired sexual function. Despite these items being rarely endorsed, the full-scale measure of consequences was generally normally distributed and exhibited adequate internal reliability, suggesting a single factor structure.

Item	Mean	SD	Notes regarding normality
Internal, personal	4.14	1.54	
Internal, physical	3.42	1.96	
Partner Cause	2.51	1.69	Positively skewed, skewness = 2.82 SE
External Cause	3.98	1.68	
Cause specific to sex	3.68	1.64	
Cause global to relationship	3.05	1.71	
Cause under individual's control	4.31	1.14	
Cause under partner's control	4.76	1.20	Negatively skewed, skewness = 2.80 SE
Stability of cause	4.33	1.03	
Partner intent	1.56	.92	Positively skewed, skewness = 6.04 SE
Partner blameworth	1.66	.95	Positively skewed, skewness = 5.70 SE
Individual Blameworthy	3.30	1.52	
Cronbach's Alpha for Attributions	.23		

Table 6: Descriptive statistics for attributions items of MASC.

Attribution items of the MASC were generally more normally distributed, with items regarding the partner (intent, etc.) being somewhat positively skewed. However,

the full-scale score was not internally reliable, suggesting the possibility of multiple factors being tapped. To test this possibility, a principle components analysis was performed using direct oblimin rotation. Three factors returned Eigenvalues of 1.5 or higher and these three factors accounted for 54% of the inter-item variance. Given inter-factor correlations as high as .19, we opted to retain direct oblimin rotation, rather than varimax rotation, which would force orthogonality of the factors.

	Factor Loading		
Item	Factor 1	Factor 2	Factor 3
Internal-personal cause	-0.01	**0.83**	0.01
Internal-physical cause	-0.34	-0.13	**0.39**
Partner cause	**0.8**	0.01	0.06
External cause	-0.12	**-0.45**	0.41
Cause specific to sex	-0.15	-0.03	-0.06
Cause global to relationship	0.33	0.31	0.32
Cause under personal control	0.02	-0.41	**0.61**
Cause under partner's control	**-0.72**	-0.11	0.3
Stability of cause	-0.11	0.3	**0.73**
Partner intent	**0.65**	-0.03	0.28
Partner blameworthy	**0.81**	-0.11	-0.1
Individual blameworthy	-0.04	**0.81**	0.11

Table 7: Factor loadings from principe components analysis.

The three factors indicated by the analysis were generally interpretable. The first factor included four items (bolded in table): partner cause, cause under partner's control, partner intent, and partner blameworthy. High scores on this factor would indicate that the woman saw her impaired sexual function as stemming from her partner, that her partner had some control over his influence, that his intent was negative, and that he was worthy of blame. The internal reliability of this factor was acceptable (.77).

The second factor included three items: internal personal cause, external cause (negative load), and individual blameworthy. High scores on this factor would indicate that the woman saw her impaired sexual function as stemming from personal, non-medical factors, that the causes were not external to her or the relationship, and that she was worthy of blame. The internal reliability of this factor was acceptable (.67). The third factor included three items: internal physical cause, cause under personal control (negative load), and stability. High scores on this factor would indicate that the woman saw her impaired sexual function as stemming from personal medical factors, that she is not in control of her impaired sexual function, and that the causes are stable. The internal reliability of this factor was below the acceptable range (.36), suggesting weak cohesiveness of this factor.

Item	Mean	SD	Notes regarding normality	Cronbach's alpha
Factor 1: Partner-related causes	7.98	3.73	Positively skewed, skewness = 4.35 SE	.77
Factor 2: Individual-related causes	10.47	3.67		.67
Factor 3: Physical causes	12.05	2.76		.36

Table 8: Descriptive statistics of attributions factors.

In addition to internal reliability, it was important to establish the basic validity of the various components of the MASC. Because the construct of sexual consequences is meant to assess processes specific to sexual activity (i.e., not more general personal or interpersonal factors), we would expect that it would be strongly related to measures of

sexual well-being, establishing concurrent validity. While it may be related to overall relational satisfaction and life satisfaction, we would expect these associations to be weaker, establishing divergent validity. Pearson product-moment correlations were calculated and confirmed these hypotheses: sexual consequences were strongly associated with sexual satisfaction (the satisfaction subscale of the FSFI; $r = -.50$, $p<.001$), more weakly associated with relational satisfaction ($r = -.34$, $p<.01$), and only marginally significantly related to overall life satisfaction ($r = -.19$, $p=.09$).

The sexual attribution factors presented a somewhat more complicated situation. For factor 1 – partner related causes – I would expect strong associations with both sexual and relational satisfaction given the explicit connection to the relational context, but weaker associations with life satisfaction. Pearson correlations confirmed these assumptions. Factor 1 was related to both sexual satisfaction ($r = -.32$, $p<.01$) and relationship satisfaction ($r = -.52$, $p<.001$), but weakly related to life satisfaction ($r = -.19$, $p=.09$).

I would also expect factor 2 – individual related causes - to be related to sexual satisfaction. However, given that perceived personal responsibility for sexual difficulties can exist relatively independent of the relational context, we would expect a weaker association between this factor and relational satisfaction. Additionally, such internal attributions may indicate a more general negative attributional style (e.g., “when things go wrong, it’s my fault”). For example, research on depressive disorders has found that the tendency to attribute negative life events to internal, stable factors prospectively predicted incidence of major depression (Alloy et al., 2006). To the degree to which

factor 2 taps such a general depressive attributional style, this factor may also be related to measures of general life satisfaction. Again, correlation coefficients generally reflect these assumptions. Factor 2 was related to sexual satisfaction ($r = -.24$, $p<.05$) and life satisfaction ($r = -.30$, $p<.01$), but not relational satisfaction ($r = -.06$, $p=.57$).

Given that Factor 3 – medical causes – was not internally reliable, it was difficult to predict how it may be related to well-being. Correlations suggested that factor 3 was not related to relational or life satisfaction, but was marginally significantly associated with sexual satisfaction ($r = -.22$, $p=.053$).

Lastly, I would expect all of these factors to differentiate between women with and without FSD. Based on the overall study hypotheses, the distress associated with impaired sexual function should depend on the degree to which it gives rise to negative consequences and is interpreted in negative ways. As such, I would expect participants who meet criteria for a diagnosis of FSD to score higher on these measures. One-way ANOVAs suggested that, compared to women with impaired sexual function only, women with FSD reported more frequent negative consequences ($F (1,82) = 29.28$, $p<.001$), higher belief in self-related causes ($F (1,84) = 7.17$, $p<.01$), and higher belief in partner-related causes ($F (1,84) = 4.00$, $p<.05$). However, belief in medical-related causes did not differentiate these two groups ($F (1, 83) = 1.42$, $p=.24$). These analyses help establish the criterion validity of these measures.

Summary

The MASC appeared generally reliable and valid, with the exception of factor 3 – medical causes – of the attribution measure. Sexual consequences appeared to adhere to a

single factor that was internally reliable, was related to measures of subjective well-being in predicted ways, and differentiated between women with and without FSD. Sexual attributions appeared to exhibit a multi-factor internal structure with the most reliable distinction being between primarily personally-related causes and primarily partner-related causes. These two factors were internally reliable and related to subjective well-being in expected ways. A third factor, chronic medical problems, also showed promise but was not internally reliable, was weakly related to measures of subjective well-being, and did not differentiate between women with and without an FSD diagnosis.

GOAL 2: TEST CROSS-SECTIONAL MEDIATIONAL MODELS

The primary assumption of my model is that impairments in sexual function affect well-being through their consequences and interpretations. This relationship would be exhibited by significant statistical mediation wherein the association between sexual function and well-being is decreased or eliminated when controlling for sexual consequences and attributions. Initially, I tested this hypothesis using the cross-sectional intake data utilizing Baron and Kenny's (Baron & Kenny, 1986) classical method. This method requires a series of four Ordinary Least Squares (OLS) linear regressions. The following criteria must be met to conclude that statistical mediation is present: the IV (sexual function) must be related to the DV (well-being), the IV must be related to the mediator (sexual consequences/attributions), the mediator must be related to the DV, and when controlling for the mediator, the association between the IV and DV must be weakened to a statistically significant degree, established using a sobel test.

Sexual consequences partially mediated the association between sexual function and sexual distress. Specifically, the direct effect of sexual function to sexual distress was significant (F (1, 81) = 19.50, p<.001; ß = .44, p<.001), sexual function was associated with sexual consequences, and sexual consequences were associated with sexual distress. Finally, the association between sexual function and sexual distress was weaker when controlling for sexual consequences (F (1,78) = 20.73, p<.001, ß = .22, p<.05) and this weakening was significant as indicated by a sobel test (z=3.15, p<.01). Alwin and Hauser (1975) created a method of roughly estimating the portion of a direct effect that is accounted for by a mediating factor. Using this method, approximately 48.4% of the total effect of sexual function on sexual distress was mediated by sexual consequences.

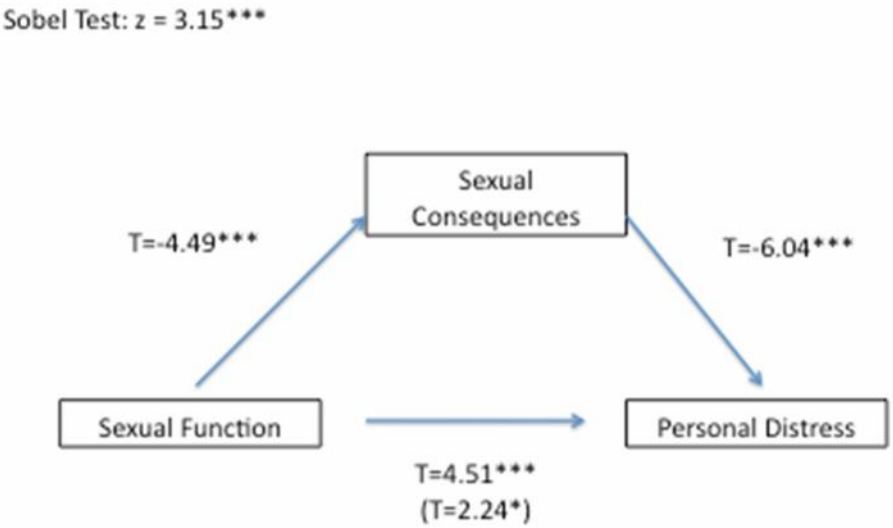

Figure 3: Mediational model using all sexual consequences.

In order to more fully elucidate this initial result, a similar procedure was followed to perform a number of exploratory analyses. Specifically, sexual function was broken down into its components to test whether sexual consequences mediated the association between each aspect of sexual function and sexual distress. Partial mediation was found in the cases of sexual arousal. Sexual arousal was associated with sexual distress ($F(1,84) = 47.72$, $p<.001$, ß = .60, $p<.001$) and this association was significantly weakened when controlling for sexual consequences ($F(1,81) = 30.07$, $p<.001$, ß = .41, $p<.001$) as indicated by a sobel test ($z=2.90$, $p<.01$). 30% of the total effect of sexual arousal on sexual distress was mediated by sexual consequences. *Full* mediation (association between sexual function and sexual distress no longer significant when controlling for sexual consequences) was found in the cases of sexual desire ($z=3.58$, $p<.001$; 45.2% of total effect mediated), lubrication ($z=2.87$, $p<.05$; 61.7% of total effect mediated), and sexual pain ($z=2.16$, $p<.05$; 77.5% of total effect mediated). No significant mediation was found for orgasm.

Each consequences was also tested individually to assess whether it mediated the association between sexual function and sexual distress. Decreased physical pleasure for self fully mediated this association (conditional ß (c') = .223, ns; $z=3.00$, $p<.01$; 49.7% of total effect mediated). Decreased frequency of sexual activity partially mediated this association ($z=2.41$, $p<.05$; 34.2% of total effect mediated), as did decreased pleasure for partner ($z=2.45$, $p<.05$; 28.8% of total effect mediated). Disruption of sexual activity was marginally significant ($z=1.83$, $p=.067$; 21.7% of total effect mediated).

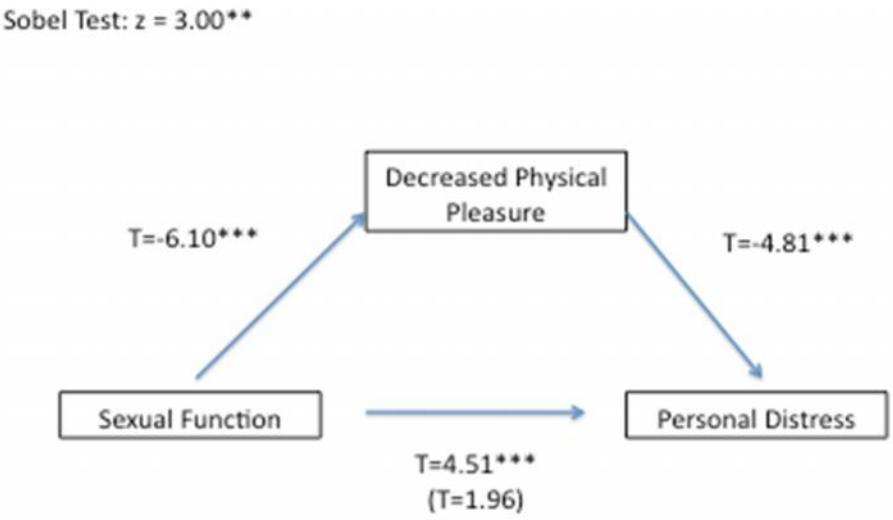

Figure 4: Mediational model using decreased physical pleasure only.

In regards to sexual attributions, no significant mediation was found – controlling for the full scale score, individual items, or subfactors generally did not significantly weaken the association between sexual function and sexual distress. However, in conducting exploratory analyses, I found significant partial mediation in that the 'global relational causes' item partially mediated the association between sexual desire ($z=2.19$, $p<.05$; 38.4% of total effect mediated) and arousal ($z=3.20$, $p<.01$; 29.3% of total effect mediated) and sexual distress.

Summary

Sexual consequences generally mediated the association between sexual function and sexual distress. The effect was especially pronounced (full mediation) for sexual desire, lubrication, and sexual pain. The effect was absent in the case of orgasm. The consequences that most strongly mediated this association were, in order, decreased

pleasure for self, decreased pleasure for partner, decreased frequency of sexual activity, and disruption of sexual activity. Attributions generally did not mediate this association, but exploratory analyses suggested that the degree to which the causes of sexual impairments were attributed to problems with the overall relationship may partially account for the association between desire/arousal and distress.

GOAL 3: TEST A SERIES OF MEDIATED MODERATIONAL MODELS

Next, I tested a series of mediated moderational models to meet two aims. First, I was attempting to replicate previously identified moderational effects of relationship satisfaction, age, history of CSA, and attachment anxiety (Stephenson et al., 2012; Stephenson & Meston, 2010; Stephenson & Meston, 2012; Stephenson, et al., 2013). The models for these tests included sexual distress regressed on sexual function, the moderating variable, and the interaction between these two predictors[6]. If a significant interaction was not found for this initial analysis, I then performed analyses including each component of the FSFI in place of the full-scale score. These analyses were appropriate given that previously identified interaction effects often applied only to specific components of sexual function. For example, in one previous study the interaction between sexual function and age (Stephenson & Meston, 2012) was tested only in regards to sexual desire.

Second, I followed the recommendations of Muller and colleagues (Muller, Judd, & Yzerbyt, 2005) to assess for mediated moderation wherein the interaction between the

[6] Preliminary analyses were also run to assess for non-linear associations between predictors and the outcome variable and, when identified, these associations were controlled for in subsequent analyses.

independent variable (sexual function) and moderator (CSA, age, etc.) is accounted for by a mediator (sexual consequences/attributions). The authors of the article describe mediated moderation as the following (note that "treatment effect" is analogous to the effect of the independent variables – in this case, sexual function):

> "mediated moderation, can happen only when moderation occurs: the magnitude of the overall treatment effect on the outcome depends on the moderator. Given that the magnitude of the treatment effect depends on an individual difference or context variable, then the mediated moderation question is concerned with the mediating process that is responsible for that moderation. What is the process through which that overall moderated treatment effect is produced?" (pg. 853)

To assess for this possibility, a number of of models must be estimated. First, the initial interaction must be significant (B_{43} in equation 1 below). Second, another two models must be estimated (equations 2 and 3 below) and two additional conditions must be met:

1) EITHER B_{53} and B_{64} are significant, or B_{51} and B_{65} are significant (both of these can be true)
2) B_{63} should be smaller than B_{43}

Equation 1 – initial moderation
$Y = \text{intercept} + B_{41}*X + B_{42}*Mo + B_{43}*X*Mo$

Equation 2
$Me = \text{intercept} + B_{51}*X + B_{52}*Mo + B_{53}*X*Mo$

Equation 3
$Y = \text{intercept} + B_{61}*X + B_{62}*Mo + B_{63}*X*Mo + B_{64}*Me + B_{65}*Me*Mo$[7]

[7] In these equations Y refers to the dependent variables, X refers to the independent variable, Mo refers to the moderator, and Me refers to the mediator. Residual error is also included in all models.

The following analyses assessed for these conditions.

Relational Satisfaction

Preliminary analyses indicated that relational satisfaction exhibited a cubic association with sexual distress, so squared and cubed transforms of CSI were included as control variables in subsequent models. The interaction between CSI and sexual function was marginally significant ($F(5, 80) = 8.63$, $p<.001$, ß = 1.02, $p=.079$; see figure 5 below). When controlling for sexual consequences, this effect became slightly more pronounced (ß =1.26, $p<.05$), suggesting a possible mild suppression effect rather than mediated moderation. In regards to attributions, two single attribution items weakened the interaction coefficient: internal personal attributions (ß for interaction term = .842, ns) and partner blameworthy attributions (ß for interaction term = .864, ns). However, these reductions were not large enough to reach significance according to Muller's (2005) criteria.

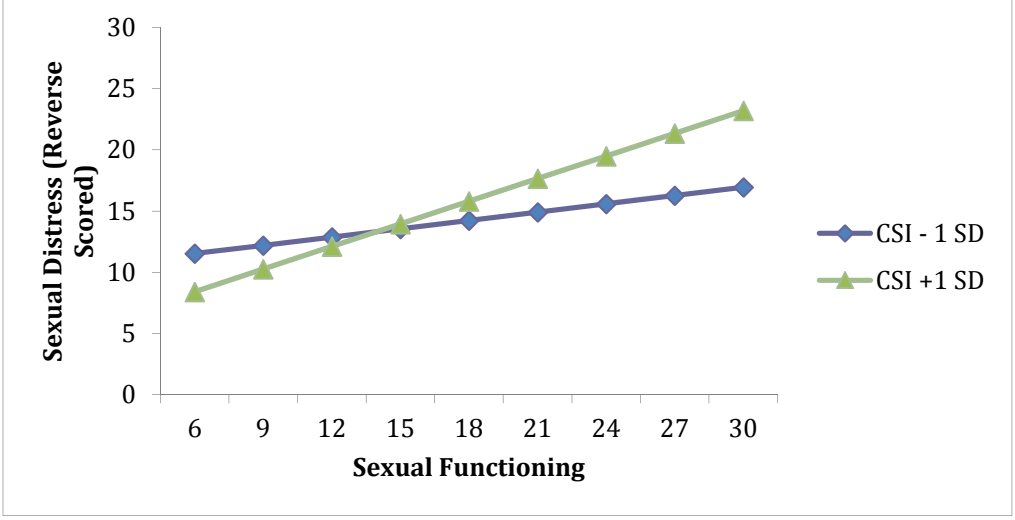

Figure 5: Interaction between sexual function and relational satisfaction predicting sexual distress.

Age

Age did not interact with sexual function in predicting sexual distress, however, the interaction between age and desire was marginally significant (F (3,85) = 8.00, p<.001, ß = -.279, p=.084; see figure 6 below). When controlling for sexual consequences, this effect became more pronounced (ß = -.519, p=.054), again suggesting a possible supression effect rather than mediated moderation. Inclusion of attributions did not affect the interaction coefficient.

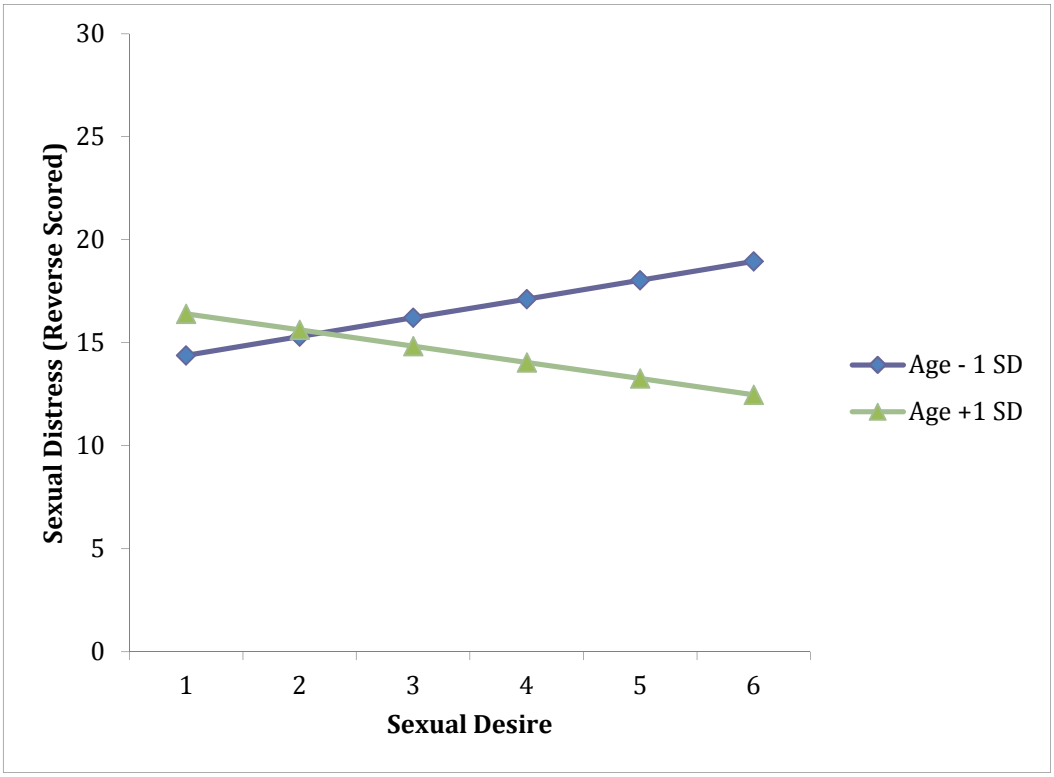

Figure 6: Interaction between sexual desire and age predicting sexual distress.

Childhood Sexual Abuse

CSA did not interact significantly with sexual function in predicting sexual distress. However, the interaction between CSA and arousal was marginally significant (F (3,84) =

17.44, p<.001, ß = .462, p=.073; see Figure 7 below). The interaction coefficiant was again strengthened by inclusion of sexual consequences in the model (ß = .507, p<.05). The interaction effect was weakened when controlling for the partner-related causes attribution factor (ß for interaction term = .386, ns) and the self-related causes attribution factor (ß for interaction term = .381, ns), but in neither case were Muller's criteria met.

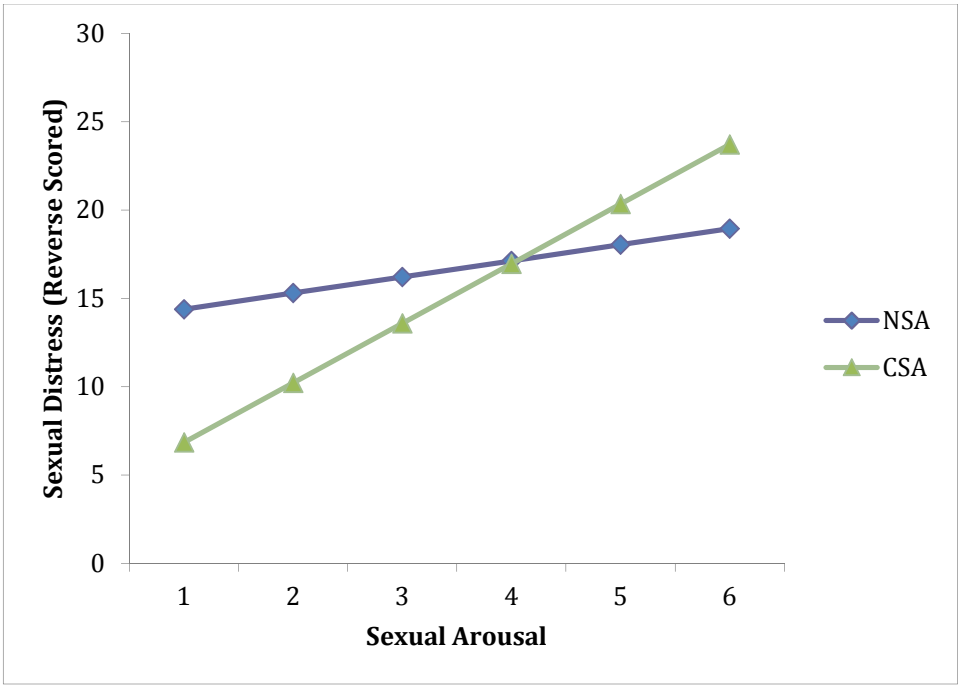

Figure 7: Interaction between sexual arousal and CSA status predicting sexual distress.

Attachment Anxiety

Attachment anxiety did not interact with sexual function or any subscales of sexual function in predicting sexual distress.

Summary

Previously identified moderating effects were partially replicated for relational satisfaction, age, and CSA, though a number of these effects were only marginally

significant and/or only applied to certain aspects of sexual function. Moderating effects of attachment anxiety received no support. Contrary to hypotheses, controlling for sexual consequences did not weaken these interaction effects. In fact, these effects were often strengthened when controlling for sexual consequences, suggesting possible supression effects. However, there was some non-significant trends towards a number of attributions weakening these interaction effects, suggesting that a larger sample may have resulted in significant mediated moderation.

GOAL 4: ESTIMATE EVENT-LEVEL ASSOCIATIONS BETWEEN SEXUAL CONSEQUENCES/ATTRIBUTIONS AND DISTRESS

The goal of these analyses was to establish whether sexual distress covaried with sexual consequences and attributions within individuals over time. Using daily diary data, I was able to minimize retrospective recall bias and reduce the number of third factors that could account for the association between these factors. I was also able to estimate the variance of these associations, in other words, whether consequences and attributions were more strongly associated with distress for some individuals as compared to others.

For these analyses, I utilized hierarchical linear modeling (HLM), which is also known as mixed effects modeling or multilevel modeling. HLM is similar to OLS regression in that a dependent variable is predicted by a model utilizing the information provided by a number of predictor variables. OLS regression creates a model that consists of fixed effects and a random effect, all at one "level" of data. For example, a simple regression model of sexual distress regressed on sexual desire would be:

$Y = B_0 + (B_1)*Desire + r$

where Y represents sexual distress, B_0 represents the intercept, or the predicted satisfaction level when desire = 0, B_1 represents the slope, or strength of association between desire and distress, and r represents the residual, or the distance between the predicted satisfaction level and the actual satisfaction level present in the data. These residuals are considered a random effect, meaning they are assumed to vary across the population. Conceptually, random effects represent the fact that the sample used for the specific regression analysis is one of many possible samples that could have been drawn and that the particular pattern of residuals may differ given a different sample.

Data with multiple measurments for each individual often require a more complicated model because random effects will be present at multiple "levels" of the model: the event level and the person level. At the event level, one assumes that the times at which data was collected represent one possible sample of the universe of time points that could have been specified. At the person level, one assumes that the data set consists of one possible sample of individuals that could have been drawn from the population. As such, a full model for, say, the association between daily sexual desure and daily sexual satisfaction would consist of an event-level (level 1) model:

$Y_{ij} = B_{0j} + (B_{1j})*Desire + r_{ij}$

where Y_{ij} (the distress of person j at time i) is a function of B_{0j} (the intercept, or the predicted distress level when desire = 0), B_{1j} (the strength of the within-individual association between desire and satisfaction), and r_{ij} (the within-individual residual

between the predicted outcome and the outcome present in the data); and a person-level (level 2) model:

$B_{0j} = \gamma_{00} + u_{0j}$
$B_{1j} = \gamma_{10} + u_{1j}$

where the within-individual parameters of B_{0j} and B_{1j} are a function of the estimated population average of these parameters (γ_{00} and γ_{10} respectively), plus some residual between person j and the average person in the population (u_{0j} and u_{1j}). An OLS regression with satisfaction regressed on desire would assume that these residuals at the person level are equal to zero. To the degree to which this assumption is false (i.e., to the degree that individuals differ in their average levels of satisfaction and the average strength of association between desire and satisfaction), OLS regression will underestimate the residual variance, increasing the chance of type I error and decreasing the reliability of significance tests. HLM takes in account the residuals at both levels of the model and, in doing so, provides a more accurate estimation of outcomes.

In addition to the more accurate estimation of residual variance, HLM has a number of additional benefits that make it an attractive choice for these analyses (Kenny, Korchmaros, & Bolger, 2003). Specifically, HLM can effectively manage missing data and does not require data points to be evenly spaced within or across individuals. As such, the analyses were not weakened by the fact that some individuals contributed more data points than others, or the fact that the time span between sexual events differed within and across individuals.

HLM analyses are typically performed in multiple steps. First, a random coefficients hierarchical model that is conditional (including predictors variables) at level one and unconditional (no predictor variables) at level 2 is specified. For example:

Level 1 model:
$Y_{ij} = B_{0j} + (B_{1j})$*SexualConsequences + r_{ij}

Level 2 model:
$B_{0j} = \gamma_{00} + u_{0j}$
$B_{1j} = \gamma_{10} + u_{1j}$

The primary parameters of interest in this case would be γ_{10}, which is the estimate of the average within-person association between sexual consequences and distress, and $u_{1j,}$ which is the estimate of the between-person variance in the strength of this association. If I found significant individual variability in the strength of these relationships (i.e., u_{1j} was significantly different from zero), a fully conditional model was specified that tested whether individual-level factors (relational satisfaction, age, attachment orientation, and CSA history) predicted the degree to which individuals differed in the strength of these associations.[8]

[8] Given that multiple data points were nested within each participant, I also considered the possibility that within-subject errors were auto-correlated. I used the mixed model function in the "lme" (linear mixed models) package available for R statistical software to re-run a number of multi-level models utilizing the corCAR1 function. This function specifies a continuous first-order autoregressive covariance structure, which is often appropriate when the multiple observations within individuals are not evenly spaced (as was the case in the current data set). Given that observations were almost always separated by more than one day (and often weeks), I did not predict a high degree of autocorrelation (any carry-over effects from day to day would be unlikely to last until the next sexual episode). This assumption was generally supported. Autoregressive coefficients (Phi) generally ranged from .18 to .20 (possible range: -1 to 1) and, in almost every case, the use of an autoregressive covariance structure resulted in slightly higher AIC values, indicating worse model fit. Thus, I retained the results from analyses utilizing standard covariance structures.

Decreased Pleasure

Decreased pleasure during sex was associated with sexual distress ($t = 8.75$, $p<.001$), and there was significant individual variability in this association (X^2 (58) = 85.40, $p<.05$). Attachment anxiety was a marginally significant predictor of the strength of this relationship. Individuals higher in attachment anxiety exhibiting a weaker association between decreased pleasure and sexual distress ($t = -1.70$, $p<.10$) such that more severe decreases in physical pleasure were associated with less distress for more anxiously attached individuals.

Disruption of Sex

Disruption of sex was significant associated with sexual distress ($t =4.82$, $p<.001$), however there was no significant individual differences in this association (X^2 (52) = 36.20, ns).

Decreased Pleasure for Partner

Decreased pleasure for partner was significantly associated with sexual distress ($t = 6.05$, $p<.001$) and there was marginally significant individual differences in this association (X^2 (50) = 64.71, $p<.10$). However, no variables predicted the strength of this association.

Partner Discomfort

Partner discomfort was significantly associated with sexual distress ($t = 3.03$, $p<.01$), but there was no significant individual differences in this association (X^2 (22) = 20.77, ns).

Partner Negative Emotions Towards Self

The partner expressing negative emotions towards himself was significantly associated with sexual distress ($t = 2.14$, $p<.05$) and there was significant individual

differences in this association (X^2 (75) = 399.85, p<.001). However, no variables predicted the strength of this association.

Partner Sadness

Partner expressing sadness was significantly associated with sexual distress (t = 4.17, p<.001), but there were no individual differences in this association (X^2 (34)= 30.88, ns).

Partner Anger

Partner expressing agner was marginally significantly associated with sexual distress (t = 1.71, p<.10) and there were significant individual differences in this association (X^2 (75) = 392.19, p<.001). However, no variables predicted the strength of this association.

Partner Relational Doubts

Partner expressing doubts about the relationship was not significantly associated with sexual distress (t = 1.01, ns), however, there was significant individual differences in both the linear and quadratic association between these factors (Linear: X^2 (1) = 5.90, p<.05; Quadratic: X^2 (1) = 4.74, p<.05). Attachment avoidance predited the strength of the quadratic association (t = -2.19, p<.05) such that partner relational doubts were associated with less distress for individuals higher in attachment avoidance.

Internal Attributions

Internal cause attributions were associated with sexual distress (t = 6.66, p<.001), and there was marginally significant individual variability in this association (X^2 (60) = 75.39, p<.10). Relational satisfaction (t = 2.77, p<.01) and age (t = 2.12, p<.05) were significant predictors of the strength of this relationship. Older women and those with

more satisfying relationships exhibiting higher levels of distress when interpreting their impaired sexual function as stemming from internal factors.

Partner Attributions

Partner-related cause attributions were associated with sexual distress ($t = 4.22$, $p<.001$), and there was marginally significant individual variability in this association (X^2 (51) = 68.31, $p<.10$). Attachment avoidance ($t = -3.21$, $p<.01$) and age ($t = 3.11$, $p<.01$) were significant predictors of the strength of this relationship. Older women and those with lower levels of attchment avoidance exhibiting higher levels of distress when interpreting their impaired sexual function as stemming from partner factors.

External Attributions

External cause attributions were associated with sexual distress ($t = 5.19$, $p<.001$), but there were no individual differences in the strength of this association (X^2 (58) = 67.22, ns).

Globality

Global relational cause attributions were association with exual distress ($t = 4.27$, $p<.001$), but there were no individual differences in the strength of this association (X^2 (37)= 31.00, ns).

Personal Control

Personal control attributions were not significantly associated with sexual distress ($t = -.26$, ns), however, there was marginally significant individual differences in the strength of this association (X^2 (58) = 74.05, $p<.10$). History of CSA marginally significant predicted the strength of this association ($t = 1.68$, $p<.10$) such that personal

control attributions were more strongly associated with distress for individuals with a history of CSA.

Partner Control

Partner control attributions were not significantly associated with sexual distress ($t = 1.49$, ns), nore were there significant individual differences in the strength of this association (X^2 (42) = 49.77, ns).

Stability

Stability attributions were significantly associated with sexual distress ($t = 2.45$, $p<.05$) and there were significant individual differences in this association (X^2 (42) = 89.46, $p<.001$). However, no variables predicted the strength of this association.

Summary

All sexual consequences aside from partner expressing relational doubts were associated with sexual distress on average and there were some marginally significant individual differences in the strength of these association. However, few of the person-level factors I assessed predicted these individual differences (with the exception of attachment orientation in two instances). Sexual attributions were less strongly associated with sexual distress on average, but there was more individual variability in this association. Additionally, a number of factors predicted this relationship including age, relationship satisfaction, and attachment orientation.

GOAL 5: TEST A MULTI-LEVEL MEDIATIONAL MODEL

Methods have recently been developed to accurately evaluate event level statistical mediation within multi-level models of time points nested within persons (Bauer, Preacher, & Gil, 2006). Using these methods, I sought to expand upon goal 2

above. The general conceptual goal, similar to that in Goal 2, was to test whether sexual consequences or attributions mediated the association between sexual function and sexual distress. Unlike the cross-sectional models used in Goal 2, the multi-level models in these analyses utilized multiple data points for each individual. As such, the entire mediational pathway (sexual function to consequences to distress) could be tested within individuals rather than between, allowing us to rule out extraneous variables that did not covary with the longitudinal variables measured. As with most indirect effects, the statistical model for these analyses includes path a, which is the association between sexual function and sexual consequences/attributions, path b, which is the association between sexual consequences/attributions and sexual distress, and path c', which is the direct effect of function on distress, controlling for consequences. The indirect effect of the IV on the DV through the Mediator consists of path a, path b, and the covariance of paths a and b. Bauer, Kristopher, & Gil (2006) have recently proposed a method for estimating and testing the various paths in the mulilevel model, as well as the level of between-individual variation. First, the model is broken down into two component equations, one where the mediator variable is the outcome, and another where the DV is the outcome:

$M_{ij} = d_{mj} + (a_j)*X_{ij} + e_{mij}$

$Y_{ij} = d_{yj} + (b_j)*M_{ij} + (c'_j)*X_{ij} + e_{yij}$

In this case, the equations would be:

$\text{Sexual Consequences}_{ij} = d_{mj} + (a_j)*\text{Sexual Function}_{ij} + e_{mij}$

$\text{Sexual Distress}_{ij} = d_{yj} + (b_j)*\text{Sexual Consequences}_{ij} + (c'_j)*\text{Sexual Function}_{ij} + e_{yij}$

Second, a model is constructed to simultaneously estimate the parameters of both equations through use of indicator variables to specify whether the outcome in question is the DV or the mediator (Bauer et al., 2006), resulting in a single combined equation. The parameters of interest in this case were a, which represents the average within-person strength of association between sexual function and sexual consequences, b, which represents the average within-person strength of association between sexual consequences and sexual distress, and the residual variance associated with each of these parameters which represent the degree of between-person variability in the strength of these associations. Additionally, the average indirect effect of function on sexual distress through sexual consequences (which is a function of the strength of path a, the strength of path b, and the covariance between these two paths) was estimated. A significant indirect effect would indicate that sexual consequences mediate the association between sexual function and sexual distress.

Using this methodology, sexual consequences were assessed as a potential mediator of the association between daily sexual function and sexual distress. Given that a number of attribution items were not included in daily measures (those that were rarely endorsed during the pilot study), the previously identified attribution factors could not be tested as mediators. As such, the attribution items available were grouped conceptually into measures of locus, globality, stability, and controllability and these subfactors were tested as mediators.

A final note – for each analysis, a conservative method of assessing statistical significant was initially used. This method utilized 95% confidence intervals obtained through bootstrapping methods, as well as group-centered predictor variables (meaning that scores on these variables represented deviations from each individual's unique average on each factor, rather that deviations from the grand mean). If this initial analysis

did not indicate significant mediation, these standards were relaxed (90% confidence intervals and grand-mean centered predictors) to assess for weaker evidence of mediation.

Sexual Consequences

Sexual consequences significantly mediated the association between sexual function and sexual distress. The overall indirect effect was -.13 and the 95% confidence interval of this effect did not overlap with zero (-.01, -.25), suggesting statistical significance at an alpha level of .05. 61% of the total effect of sexual function on sexual distress was accounted for by the indirect effect of sexual function through sexual consequences on sexual distress.

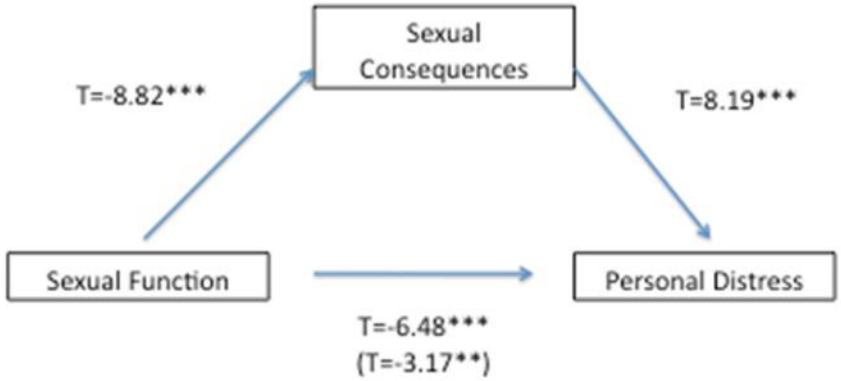

Figure 8: Multi-level indirect effects model – all consequences.

To better understand which consequences may be driving this effect, I conducted exploratory analyses to assess each consequence as a mediator. The only consequence that significantly mediated the sexual function – distress association was decreased pleasure for self. The average indirect effect was -.097 (95% CI: -.02, -.17). 59% of the

total effect of sexual function on sexual distress was accounted for by the indirect effect of sexual function through decreased physical pleasure on sexual distress. These results suggest that the consequence of decreased physical pleasure may be driving the mediating effects of sexual consequences.

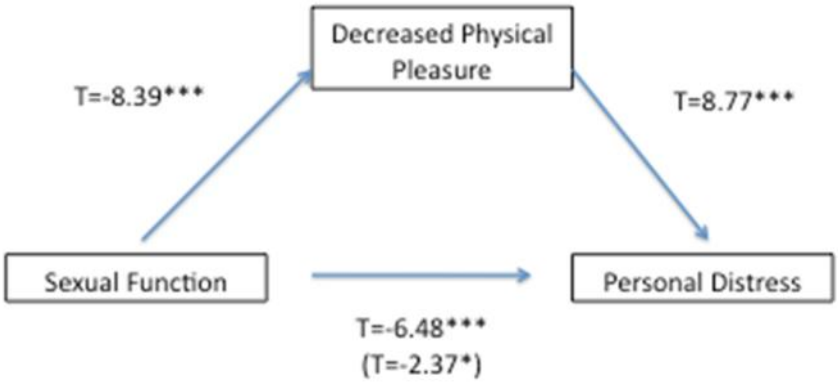

Figure 9: Multi-level indirect effects model – Decreased physical pleasure.

Sexual Attributions

Locus attributions marginally significantly mediated the association between sexual function and sexual distress. Specifically, the average indirect effect was -.05 and the 95% confidence intervals of this effect overlapped with zero (.07, -.17), however, the 90% confidence intervals did not (-.01, -.10) overlap with zero, suggesting that this effect was significant at an alpha level of .10, but not .05. 32% of the total effect of sexual function on sexual distress was accounted for by the indirect effect of sexual function through locus attributions on sexual distress. Additionally, this indirect effect was significant at the .05 alpha level when predictors were not group-mean centered (95% CI: -.01, -.13). Taken together, these results suggest that locus attributions may act as a

mediator of the association between sexual function and distress, but that this indirect effect is likely weaker on average than the effect of sexual consequences. Other attributions did not significantly mediate this association.

Chapter 4: Discussion

The goal of this dissertation was to begin to answer the questions of when and why impaired sexual function is distressing to women. My results have provided preliminary answers to these questions and suggest new avenues for future research. The conceptual model used to organize my hypotheses posited that the immediate consequences of impaired sexual function and the causal attributions made by the individual regarding her impaired sexual function represent mechanisms through which these impairments exert negative effects on subjective well-being.

SUMMARY OF RESULTS

In order to test these hypotheses, I first created a measure assessing both a range of sexual consequences (decreased pleasure for self or partner, negative partner reactions, prevention/disruption of sexual activity) and causal attributions (including locus, globality, stability, intent, control, and blame attributions) regarding the individual's impaired sexual function – the measure of attributions and sexual consequences (MASC). Initial tests suggested that the subscale assessing sexual consequences was clear to participants, internally reliable, and exhibited adequate convergent, divergent, and criterion validity. The attributions subscale, based on the RAM (Bradbury & Fincham, 1992), exhibited a multi-factor internal structure. The first two factors, causes of impaired sexual function related to the individual's personal, non-physiological characteristics and causes perceived as related to the partner, exhibited adequate internal reliability, and convergent, divergent, and criterion validity. However, the third factor, causes perceived as stable, uncontrollable medical causes, was found to have questionable reliability and validity. The two items measuring globality (cause specific to sexual activity vs. global to

the relationship) were not included in these factors. In sum, although portions of the attributions measure show less than acceptable psychometric charaterstics, the MASC was generally found to be a reliable and valid measure.

Armed with this measure, I tested cross-sectional mediational models to examine whether sexual consequences and/or attributions could account for the association between sexual function and sexual distress. Sexual consequences did exhibit statistically significant mediation. The association between sexual function and sexual distress was essentially cut in half when controlling for sexual consequences, suggesting that impaired sexual function *may* cause distress because of these negative consequences (given the cross-sectional nature of these analyses and the fact that no factors were directly manipulated, this interpretation of these initial results is tentative as discussed in greater length below). Exploratory analyses revealed that this mediation was driven by desire, lubrication, and sexual pain, the effects of which were fully mediated by sexual consequences. Alternatively, the association between orgasm and sexual distress actually strengthened when controlling for sexual consequences, suggesting unique mechanisms for orgasm's effect on sexual distress[9].

[9] Why didn't consequences mediate the association between orgasm and sexual distress? Given that the current project was the first to assess these consequences, I am left with speculation only. However, given the internal, subjective nature of orgasm, it is quite likely that orgasm simply doesn't engender many of the consequences measured in this study. For example, not reaching orgasm would not necessarily do anything to disrupt sexual activity. Additionally, the fact that a number of participants reported faking orgasms during sexual activity suggests that partners may not be as aware of these impairments as they are of others such as low lubrication or pain, leading to a lower frequency of negative partner responses. Alternatively (or additionally), orgasm may have more symbolic meaning for women than other aspects of sexual function. As a result, impaired orgasm may be more inherently distressing and/or the mechanisms of this distress may be more internally cognitive in nature (e.g., I'm frigid, etc.), decreasing the importance of sexual consequences.

Unlike sexual consequences, sexual attributions generally did not significantly mediate these associations. However, exploratory analyses suggested that the effects of sexual desire and arousal were partially mediated by the relational globality item. In other words, these aspects of sexual function may affect distress levels to the degree that they are seen as stemming from wider problems in the relationship. As above, this interpretation is very tentative given the nature of the methods and statistical analyses used.

Next, I attempted to apply the constructs of sexual consequences and attributions to previous findings in this area, first by attempting to replicate previously identified moderating effects, then by assessing whether either sexual consequences or attributions could account for these effects. Mediated moderation would suggest that these moderating variables may function through their impact on these mediating factors. Three of four previously identified interactions received some support in the current sample. Relational satisfaction, age, and history of CSA interacted with at least one aspect of sexual function in predicting sexual distress. Mirroring earlier findings (Stephenson & Meston, 2012; Stephenson et al., 2013), women in unsatisfying relationships and older women exhibited weaker associations between sexual function and distress.

In these cases, the weaker association between sexual function and distress in each case was driven by the fact that slightly impaired sexual function was associated with higher distress (or, synonymously, that higher levels of sexual function were not as beneficial). In the case of relational satisfaction this applied to sexual function overall, mirroring earlier findings in this area (Stephenson et al., 2013). In the case of age, only

the effects of sexual desire on distress were moderated. This finding is in line with previous research that assessed only sexual desire when testing the moderating effect of age (Rosen et al., 2009; Stephenson & Meston, 2012). Results regarding CSA differed slightly from previous findings (Stephenson et al., 2012). Instead of women with a history of CSA exhibiting more distress in the context of higher levels of sexual function, in the current sample they exhibited more distress than women without abuse histories in the context of *worse* function. In other words, more impaired function seemed to be more distressing for women with a history of CSA. Additionally, this interaction was only present in the case of sexual arousal whereas past studies had identified similar interactions for additional aspects of sexual function (desire, orgasm, etc.). However, in the previous study, sexual arousal was the component of sexual function that exhibited the strongest interaction with CSA status in predicting sexual distress. Given the relatively small number of women with CSA histories in the current sample (N=24) as compared to the number in the previous study (N=105), it makes sense that only the strongest interaction effects would be detected. Lastly, attachment anxiety did not significantly interact with sexual function in the current sample[10].

There were a small number of non-significant trends towards the predicted mediated moderation. Specifically, the self and partner-related attribution factors weakened the moderating effect of CSA history, suggesting that women with abuse histories may be more distressed regarding impairments in sexual arousal because they

[10] It is difficult to say why this interaction was not replicated in the current study. However, the fact that this particular finding was initially identified in a sample made up of undergraduate college students may be of some importance. It is quite possible that attachment orientation may play a larger role for young women, who are more likely to be in short-term, less stable relationships than their older counterparts.

interpret these impairments as stemming from factors internal to the individual or the partner (as opposed to external factors). Additionally, items tapping internal cause attributions and partner blame weakened the moderating effect of relational satisfaction suggesting that women in less satisfying relationships may be more distressed regarding minor impairments in sexual function because they interpret these impairments as stemming from factors internal to themselves and/or that their partner is to blame for their difficulties. However, mediated moderation effects were not statistically significant in these cases and, aside from these isolated trends, there was little support for mediated moderation. In fact, in a number of cases, the interaction effects were strengthened when controlling for sexual consequences and attributions, suggesting possible supression effects.

So, while sexual consequences seem important and account for a significant amount of variance in sexual distress, they do not appear to represent a mechanism through which previously identified moderating factors function. Alternatively, it may be that sexual consequences account for unique variance related to the couple's "sexual scripts," and their ability to flexibly cope with sexual difficulties. Rosen and colleagues (Rosen, Leiblum, & Spector, 1994) have outlined various dimensions of internalized scripts for sexual activity in couples and suggested that, in cases of chronic sexual dysfunction, the couple's script often becomes restricted and inflexible (Rosen et al., 1994). This rigidity of sexual interactions could be strongly related to the incidence of many sexual consequences measured in the current study. Accounting for variance related to these processes may have allowed for the more powerful identification of

interaction effects that may be driven by more intrapersonal processes. Indeed, there was some indication that the mechanisms of these interactions may instead be more cognitive in nature and less dependent on external consequences.

While informative, all of the above analyses were limited in a number of ways including retrospective recall bias (Levine & Safer, 2002) and the large number of "third variables" that could account for correlations between factors. To help minimize these limitations, I conducted a number of analyses using daily diary data. My primary goals in these analyses were to replicate cross-sectional findings regarding the association between sexual consequences/attributions and sexual distress using a time-series design so that relationships between factors could be examined on an intra-individual basis. While still not indicative of a causal relationship, results showing that factors covary within an individual over time are helpful in ruling out a large number of stable third variables that could account for the cross-sectional association between factors. As such, the predictor variables in these analyses were centered around each individual's mean score of that variable – a conservative method of performing multi-level analyses that specifically assesses intra-individual variation over time.

In general, sexual consequences were strongly associated with sexual distress in these analyses. While there were some individual differences in the degree to which specific consequences were associated with sexual distress, these differences were generally small and the variables included in the current study did not often predict these differences. Conversely, sexual attributions were more weakly (though still significantly) associated with sexual distress, and the strength of this association often differed between

individuals. I identified a number of predictors of the strength of these associations, however, these effects were generally only marginally significant. Specifically, older women were more distressed by their impaired sexual function when they believed that the cause(s) of their impaired sexual function were internal to themselves or the relationship than were younger women. Women in unsatisfying relationships were also more distressed by internal attributions. Additionally, women who were more avoidantly attached were more distressed by partner-related attributions. Lastly, women with a history of CSA were somewhat more distressed when they perceived themselves as in control of their impaired sexual function. Taken together, these analyses strengthen my confidence in the existence of a relationship between both sexual consequences and attributions and sexual distress. While there are some individual differences in how distressing some conseqeunces and attributions are, these differences were relatively weak in the current sample and, thus, replication would be nesessary before I can draw any confident conclusions regarding these findings.

In perhaps the most important analyses in this dissertation, I tested a multi-level mediational model to assess my primary hypothesis – that impaired sexual function influences subjective distress through its specific sexual consequences and the ways in which it is interpreted. Sexual consequences did significantly mediate the association between sexual function and sexual distress. Decreased physical pleasure was the consequence primarily responsible for this effect, accounting for approximately 59% of the total effect of sexual function on distress. Other consequences did not exhibit significant mediation. Locus attributions also mediated this association, although this

effect was only marginally significant. The degree to which impaired sexual function was seen as stemming from factors within the individual or her relationship, or to outside factors accounted for approximately 32% of the total effect of sexual function on distress[11].

WHY IS IMPAIRED FEMALE SEXUAL FUNCTION DISTRESSING?

According to the results of the current study, much of sexual function's association with subjective distress is accounted for by the immediate consequences of impaired sexual function, especially decreases in pleasure for the individual. This centrality of pleasure is in contrast to many stereotypes regarding female sexuality as being primarily based on emotions of intimacy and dependent on the interpersonal relationship with the partner (Petersen & Hyde, 2010). Indeed, the reactions of the partner, while related to distress, did not account for any of the association between impairments in sexual function and distress in the current study. While these results do not diminish the importance of the relationship, they do suggest that physical pleasure may be just as important in playing into women's sexual motivation (Meston & Buss, 2007) and their subjective assessment of the quality of their sexual experiences.

WHEN IS SEXUAL FUNCTION ASSOCIATED WITH DISTRESS?

A number of previous findings were generally replicated, increasing my confidence in stating that some sexual function impairments are associated with higher

[11] Why did attributions mediate in the repeated measures, but not cross-sectional analyses? Certainly factors such as retrospective recall bias may be at play in the context of cross-sectional analyses. Also, the fact that the multi-level analyses tap intra-individual variability rather than inter-individual variability may be of importance. Beliefs that the cause of a sexual impairment is due to oneself or one's partner may be quite distressing on average, but may be even more so when this interpretation is stronger than would be typical for an individual. This type of variability is not assessed in cross-sectional analyses and may be particularly important in the case of sexual attributions.

levels of distress when women are older, in unsatisfying relationships, or have a history of CSA. Attachment orientation may or may not moderate this association. While some functional impairments were found to be less distressing for anxiously attached women in a previous study (Stephenson & Meston, 2010), these results were not replicated in the current study. This discrepancy could be due to the differences in sample make-up, or the smaller sample size (and thus decreased statistical power) in the current study. The fact that, despite these differences in sample and study design, three of four moderation effects received some support is important. Not only does this replication increase my confidence that these findings do not represent type-I errors, it also suggests that these findings are applicable to clinical populations suffering from sexual dysfunction. Unfortunately, I was unable to identify mechanisms of these interactions, though there was some indication that these mechanisms may be cognitive in nature rather than behavioral. Future research may benefit from assessing a wider range of cognitive factors (see below) when examining these associations.

Taken together, these findings add to our theoretical and clinical understanding of female sexual dysfunction in a number of ways. First, the results suggest that impaired sexual function may not be distressing in and of itself. Rather, the current study provides some evidence that the consequences and interpretations engendered by the impairments may account for a large part of resulting distress. Additionally, I found evidence that A) various distressing consequences and interpretations are only present in some cases of impaired sexual function, and B) that some individuals may find certain consequences and interpretations more distressing than others.

THEORETICAL IMPLICATIONS

These findings also suggest basic expansions of Barlow's model of sexual dysfunction. In particular, they suggest that decreased pleasure may be the primary distressing immediate consequence of impaired female sexual arousal in many cases. This decrease in pleasure (one of the primary rewarding aspects of sex) may help maintain the negative affect and expectancies that initiates the dysfunctional affective/attentional cycle as outlined by Barlow (1986). In other words, the negative mind-set that individuals with sexual dysfunction bring to sexual activity may be maintained, at least partially, by the fact that they often experience less pleasure than they might expect (or want) during sexual activity, leading to increased frustration and distress being associated with sexual activity in the future. This maintenance mechanism may exist relatively independently from those originally proposed by Barlow - primarily distraction and avoidance – or may represent a latter link in the causative chain of the model. Specifically, individuals may begin engaging in distraction and this distraction could then reduce their pleasure, resulting in distress and continued maintenance of negative sexual schemas.

Additionally, in the language of the Dual Control Model of sexuality (Bancroft et al., 2009), decreased physical pleasure would likely lessen activation of the sexual excitation system. Pleasure is one of the most common factors motivating both men and women to engage in sexual activity (Meston & Buss, 2007). As such, to the degree to which pleasure is decreased by impaired sexual function, one of the primary motivators for sexual activity is removed, and the excitation system may be de-activated, potentially

maintaining impairments in desire and arousal. Additionally, if this decreased pleasure results in negative emotional responses such as anxiety and frustration (as suggested in the current study), the sexual inhibition system may also be activated to a greater degree in order to protect the individual from these negative emotional outcomes. Taken together, this decreased excitation and increased inhibition may help maintain a variety of impairments in sexual function.

While this conceptualization of sexual dysfunction – that decreases in pleasure maintain negative sexual expectations and schemas and engage counterproductive neurological systems - may be quite stable if not addressed, it is also quite maliable in that decreased pleasure is not an inescapable consequence of impaired sexual function. To the degree to which decreased pleasure and other negative consequences can be separated from sexual function, it is likely possible to make the impaired function less distressing, disrupting dysfunctional cycles by decreasing the negative affect and expectations that accompany sexual activity. Indeed, this goal of disentangling impaired sexual function from its common negative sequelae is a major component of one of the most studied treatments of sexual dysfunction: sensate focus.

CLINICAL IMPLICATIONS – SENSATE FOCUS

Sensate focus is a couples-based method of sex therapy based on Masters and Johnson's (1970) research. Sensate focus begins with a mutually agreed upon ban on intercourse, which serves to relieve the pressure and anxiety that can stem from the "performance" demands of sex and allows the couple to start from scratch in building up positive sexual experiences. The couple then progresses through a series of exercises

beginning with those that are least anxiety-provoking and furthest from intercourse (e.g., a fully clothed shoulder massage) and progressing to more explicitly erotic activities later in treatment. During each activity, partners take turns playing the role of either receiver or giver of pleasure. The receiver's role is to focus on his/her pleasurable physical sensations in the moment and provide feedback to the partner. The giver's role is to explore his/her partner's body (within pre-defined limits) and implement the partner's feedback. The couple remains at each activity level until their subjective anxiety has subsided (similar to repeated exposure techniques used in behavioral therapies), before moving to a slightly more difficult level, typically one that is closer to intercourse. The major aims of these exercises are A) to increase each partner's knolwedge of what is pleasurable to both him/herself and the partner, B) to decrease anxiety associated with sexual activity, and C) to have the couple redefine sexual activity. Rather than a goal-oriented and orgasm-centric event, sex becomes a present-focused appreciation of physical pleasure and intimacy.

Sensate focus is one of the most-studied forms of sex therapy and has been supported in a number of empirical studies. In early trials, success rates of between 84% and 100% were reported (Heinrich, 1976; Masters & Johnson, 1970). However, more recent studies have indicated that sensate focus and related treatments are not effective in all cases, with success rates in later efficacy studies ranging from 40-60% (e.g., McCabe, 2001; Stinson, 2009; Trudel et al., 2001), a rate mirrored by a small number effectiveness studies (Sarwer & Durlak, 1997). One difficulty in maximizing the effectivness of this psychotherapeutic intervention is that there is no evidence regarding the mechanisms

through which sensate focus improves sexual function and satisfaction. Empirical studies have not reported factors that mediate treatment effects and I am not aware of any dismantaling studies that would provide information regarding the active ingredients of sensate focus, which includes several components (including systematic desensitization and an early form of mindfulness practice), and is often combined with psychoeducation, relaxation training, and communication training (Heiman & Meston, 1998). While not explicitely adressing sensate focus, the current project suggests a possible mechanism that may mediate the effectiveness of sensate focus and similar interventions in reducing sexual distress: decreasing the negative consequences of impaired sexual function.

One of the most initially counter-intuitive aspects of sensate focus exercises is that the couple is encouraged to *not* become sexually aroused. In fact, in mid-treatment exercises, the couple is instructed to discontinue stimulation of the genitals (though not pleasurable touching in general) if the individual being touched becomes aroused and continue again once this arousal has subsided. The most extreme example of this process, referred to as "vaginal containment," involves the male partner repeatedly manually inserting his flacid penis into his partner's vagina and removing it once the penis becomes erect. In effect, these processes explicitely disconnect physical pleasure from sexual arousal, showing that either can exist in the absence of the other. In other words, these experiences show the couple that decreases in arousal need not end, nor even significantly decrease, the experience of physical pleasure during sexual activity. More generally, one of the ultimate outcomes of these exercises is to vastly reduce a wide range of negative consequences of decreases in arousal. Indeed, arousal is purposfully kept

inhibited and the negative consequences that can result from this experience, such as decreased pleasure, disuption of sexual activity, and negative partner responses, are partialled out and replaced with positive consequences such as continued pleasure, emotional intimacy, and communication.

The results presented in the current project suggest that the experience of these negative consequences may largely determine how distressing impairments in sexual function are and, consequently, that the removal of these consequences may make these impairments less distressing. Indeed, in the practice of sensate focus, removal of the negative consequences of impaired arousal tends to very quickly decrease distress regarding sex. Morever, these changes in the couple's sexual experiences tend to decrease the importance of arousal (and other aspects of sexual function) in general. This change then decreases the pressure and anxiety associated with sexual activity, leading to natural increases in sexual function over time. To my knowledge, the current study represents the first empirical support for these specific processes thought to underlie sensate focus. The results suggest that the ability to maintain high levels of pleasure and emotional connection in the face of impaired sexual function may be one of the primary mechanisms by which sensate focus improves levels of subjective sexual well-being and, subsequently, sexual function.

CLINICAL IMPLICATIONS – COGNITIVE MECHANISMS

In most cases, behavioral interventions such as sensate focus are augmented with cognitive techniques that focus on underlying beliefs and schemas regarding sex and relationships that maintain impaired sexual function and/or avoidance of sexual activity.

The current findings suggesting that some causal attributions may partially mediate the association between sexual function and distress supports the importance of this cognitive component. Specifically, it may be important to explore the degree to which the patient views their sexual difficulties as a reflection of either a personal failing, or of inadequacies on the part of the partner. These internally-focused cognitions have been recognized as potentially detrimental to sexual well-being in men (Weisberg et al., 2001), and as harmful to general well-being for both men and women in the context of mood disorders (Alloy et al., 2006). A more balanced and accurate view of personal and contextual precipitating factors is often a goal of cognitive therapy in general (Beck, 1995) and cognitive sex therapy in particular (Stinson, 2009).

Oddly, in the current study, perceiving impaired sexual function as caused by factors external to the self or the relationship was also associated with higher distress in some cases. In both previous research (Weisberg et al., 2001) and the cross-sectional analyses in the current study, perceiving external causes of impaired sexual function was associated with *less* sexual distress. However, in the repeated measures analyses in the current study, perceiving causes as external was associated with *more* distress. To attempt to understand this unexpected finding, I explored various iterations of my statistical models, controlling for other attributions such as controllability and stability. Controlling for these factors did not change the relationship between external causal attributions and distress and, as such, it is doubtful that external causes were more distressing because they were seen as less controllable or more permanent. It may be that external attributions are associated with more difficult socio-cultural contexts in general (e.g., more

work/school stress, financial difficulties, small children in the home, etc.) and that impaired sexual function was more distressing because the individual's coping mechanisms were already over-taxed by dealing with these adverse circumstances. Additional research assessing the wider social context would be necessary to test this hypothesis.

CLINICAL IMPLICATIONS – DIAGNOSIS

The nosology and diagnosis of female sexual dysfunction will likely undergo a number of changes with the impending publication of the DSM-V (APA, 2012). One of the most important of these proposed changes is the combination of HSDD and FSAD into a single diagnosis of "Female Sexual Interest/Arousal Disorder." This proposal is the result of a number of studies suggesting that women have difficulty differentiating between sexual desire and arousal, especially since the introduction of "responsive desire" that emerges only after the initiation of sexual activity (Binik, Brotto, Graham, & Segraves, 2010; Brotto, 2010). There is also a high rate of commorbidity between desire and arousal diagnoses. However, other experts in the field disagree with this proposal, suggesting that requiring both impaired desire and arousal would exclude women with impairments in only one area or the other (Clayton, Derogatis, Rosen, & Pyke, 2012).

The current findings are generally more in line with retaining impaired desire and arousal as two distinct diagnoses. While it is clear that these aspects of sexual function are closely related, the findings related to desire and arousal were different in a number of ways. First, and most simply, the correlation between scales of desire and arousal was .53. While this suggests a significant association, it also implies that only 28% of

variance in one scale is systematically related to the other. Second, the association between sexual desire and distress was fully mediated by the sexual consequences measured (with 45% of total effect mediated), while the association between arousal and distress was only partially mediated (with 30% of the total effect mediated). Third, desire and arousal interacted with different factors in predicting distress. Specifically, desire (but not arousal) interacted with age in predicting sexual distress and arousal (but not desire) interacted with CSA status in predicting distress. Given these differences, it is likely that the combination of sexual desire and arousal into a single diagnosis would not accurately reflect the potentially important differences between the two constructs and how they relate to contextual factors.

FUTURE DIRECTIONS

The current research could be expanded in a number of ways. First, while the current study assessed the degree to which a number of negative consequences of impaired sexual function actually *did* happen, it will be important for future research to consider the perceived possibility of negative consequences that *never actually* happen. For example, a woman could fear that her sexual impairments may cause her partner to suddenly end the relationship (or seek sexual fulfillment outside the relationship), even if the partner never gives any indication of this possibility. Indeed, much of the anxiety-maintaining beliefs in the context of disorders such as Social Anxiety Disorder and Panic Disorder are related to highly unlikely outcomes that rarely or never occur (e.g., having a heart attack, going crazy, being laughed at). Second, it will be important for future research to consider not only the occurrence of negative consequences, but also the

absence of positive outcomes such as partner support in response to impaired sexual function. For example, a neutral unsympathetic response from a partner may be as distressing in some cases as an overtly negative response. Indeed, a negative response at from the partner would at least suggests that the individual's sexual response is of some importance him. In support of this possibility, one study (Snyder & Berg, 1983) found that a partner's lack of responsiveness to sexual requests was more strongly related to sexual distress than was the individual's own level of sexual function. Future studies in this area would benefit by assessing both the presence and absence of positive partner responses as important contextual factors that could affect the association between sexual function and distress.

Additionally, while causal attributions have been recognized as important in a number of fields including marital research and mood disorders, they represent only a small portion of cognitions regarding sexual impairments. For example, the classic Hopelessness Theory of Depression (Abramson, Metalsky, & Alloy, 1989) identifies three distinct categories of cognitions regarding life events that constitute contributory causes of depressive symptoms: attributions regarding causes of events, attributions regarding the consequences of events, and attributions about the self given that the even occurred. While the current study assessed causal attributions (and attributions regarding consequences are mentioned above), attributions regarding self-relevance (i.e., what does this problem say about me?) could be of particular importance in the sexual realm. One possible extension of the current work would be to assess the degree to which different sexual impairments activate dysfunctional "core beliefs" as described by Beck's

cognitive theory (Beck, 1967). In Beck's seminal work on cognitive techniques (Beck, 1995), he described two primary types of core beliefs – helpless beliefs and unlovable beliefs – that underlie a majority of the negative affect-inducing automatic thoughts addressed in cognitive therapy. Helpless core beliefs include: I am powerless, I am vulnerable, I am inadequate, and I am a failure. Unlovable core beliefs include: I am undesirable, I am unwanted, I am defective, and I am bound to be rejected/abandoned. The degree to which such negative concepts about the self are activated by sexual impairments may play a large role, independently of causal attributions, in determining how distressing these impairments are to the individual.

LIMITATIONS

Aside from not measuring the factors described above, the current study had a number of limitations that necessarily limit my confidence in the the findings. First and foremost, this was a correlational study meaning that no variables were directly manipulated. As such, I cannot make any confident conclusions regarding either the existence or direction of causal relationships between variables. For example, while my conceptual model suggests that impaired sexual function gives rise to certain consequences which then influence distress levels, I have no way of ruling out the opposite direction of causality: pre-existing distress levels could give rise to consequences/attributions, which could then effect sexual function through some other means. Alternatively, there could be some other variable that covaries with sexual function, consequences, and distress that explains the direct and indirect statistical effects identified in the current study. To draw firm conclusions regarding causal relationships as

suggested here, experimental manipulation would be necessary. One promising avenue for such research may come in the form of dismanteling studies of interventions for sexual dysfunction wherein different contextual factors surrounding the dysfunction (e.g., decreases in pleasure, cognitions, partner responses) can be manipulated relatively independently of other factors. However, as in most clinical research, true isolation of factors would likely be difficult given the interconnectivity of behavioral, cognitive, and affective factors.

A second major limitation of the current study is that key variables in the study were measured by a newly constructed scale – the MASC. While I attempted to establish basic reliability and validity information of this scale, additional work with this measure would result in increased knowledge about its strengths and limitations (e.g., what is its test re-test reliability?), allowing for increased confidence of the current results. Additionally, a number of aspects of the sample limit the generalizability of the results. Specifically, older women (over age 50) and women with only a highschool education or less were poorly represented in the sample. While this is a limitation common to much research in the social sciences, it is of special concern in the current study given the established relationship between both age and education level and sexual function. Specifically, the prevalence of impairments in sexual function tends increaese with age, especially after menopause (Rosen et al., 2009; Shifren et al., 2008). The relatively restricted age range in my sample suggests that very few participants were peri- or post-menopausal and, as such, caution is warranted in generalizing these findings to older women. Additionally, distressing sexual impairments have been found to be 40% more

likely in women with 12 or fewer years of education (Shifren, et al., 2008), a population not included in the current study. It would be of great interest to include targeted sampling of populations with less education in future studies to assure that the current findings apply to these women.

Lastly, due to practical constraints, I did not directly assess the partner's experience in the current study. Assessment of the partner's emotional and behavioral reactions (as well as sexual dysfunction on the part of the partner) would surely add to the richness of my statistical models and resulting undestanding of the interpersonal context of sexual activity. However, it is also likely that most of the impact of partner-related factors on the individual's distress level is transmitted through the individual's subjective judgments regarding the partner's response, rather than the "true" state of the partner. Again, further research that assesses both partners would be necessary to confirm this assumption.

CONCLUSIONS

Despite these limitations, the current study suggests that, in many cases, impaired sexual function may be distressing to women because it decreases their physical pleasure and, possibly, because of how the causes of the impairment are perceived. These findings add to our understanding of theoretical models of sexual dysfunction and suggest possible mechanisms through which existing interventions positively impact women's sexual experiences.

The results of this study also represent a potential bridge between tradtional "medicalized" research on sexual dysfunction and "new views" of female sexuality such

as those espoused by Leonore Tiefer and colleagues. Tiefer's "new view" posits that female sexuality has been medicalized over the past 20 years, with researchers and clinicians focusing on physiological and intrapersonal processes associated with deviations from a universal "normal" sexual response, giving little thought to interpersonal and cultural etiological and maintaining factors of female sexual difficulties. The author of this view (Tiefer, 2001) advocates for "sexuality research, education, and practice that are meaning-centered rather than function-centered" (pg. 89), and which deemphasize biological factors such as genital response.

While I agree with Dr. Tiefer that the most important focus of sexuality research is on the meaning that individuals attach to their sexual experiences, I disagree with the dichotomization of these foci. While genital response and related processes such as orgasm and sexual pain are not necessarily inherently meaningful to women, the fact remains that these symptoms are distressing to many women to the point where they ruin relationships and severely impair quality of life (Leiblum, 2007). As such, it seems essential to understand the mechanisms through which meaning is attached to these symptoms. If new types of "disorders" are being artificially created and marketed by pharmaceutical companies to produce increased demand for treatments, how does this process unfold? What vulnerabilities are being triggered within the individual to create the amount of distress seen in cases of diagnosable sexual dysfunction? In other words, why are certain levels of sexual function so meaningful to these women when they need not be? The current project represents a first step in answering these important questions, and these answers hold the potential for more effective treatment of the sexual

difficulties, however they are defined, that impair the quality of life for millions of women worldwide.

Chapter 5: References

Abramson, L. Y., Metalsky, G., & Alloy, L. B. (1989). Hopelessness Depression: A theory-based subtype of depression. Psychological Review, 96, 358-372.

Alloy, L. B., Abramson, L. Y., Whitehouse, W. G., Hogan, M. E., Panzarella, C., & Rose, D. T. (2006). Prospective incidence of first onsets and recurences of depression in individuals at high and low cognitive risk for depression. Journal of Abnormal Psychology, 115, 145-156.

Alwin, D. F., & Hauser, R. M. (1975). The decomposition of effects in path analysis. American Sociological Review, 40, 37-47.

Association, A. P. (2012). American Psychiatric Association DSM-5 Development Sexual Dysfunctions Retrieved 10/8/12, 2012, from http://www.dsm5.org/proposedrevision/Pages/SexualDysfunctions.aspx

Association, A. P. (Ed.). (2000). Diagnostic and statistical manual of mental disorders – text revised (4th ed.). Washington D.C.: American Psychiatric Association.

Bancroft, J., Graham, C. A., Janssen, E., & Sanders, S. (2009). The Dual Control Model: Current status and future directions. Journal of Sex Research, 46, 121-142.

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. Journal of Consulting and Clinical Psychology, 54, 140-148.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51, 1173-1182. doi: 10.1037/0022-3514.51.6.1173

Bauer, D. J., Preacher, K. J., & Gil, K. M. (2006). Conceptualizing and testing random indirect effects and moderated mediation in multilevel models: New procedures and recommendations. Psychological Methods, 11, 142-163.

Baumeister, R., Catanese, K. R., & Vohs, K. D. (2001). Are there gender differences in strength of sex drive? Theoretical views, conceptual distinctions, and a review of relevant evidence. Personality and Social Psychology Review, 5, 242-273.

Beck, A. T. (1967). Depression: Clinical, experimental, and theoretical aspects. New York, NY: Harper & Row.

Beck, J. S. (1995). Cognitive Therapy: Basics and beyond. New York, NY: The Guilford Press.

Binik, Y. M., Brotto, L. A., Graham, C. A., & Segraves, R. T. (2010). Response to the DSM-V sexual dysfunction subworkgroup to commentaries publised in JSM. Journal of Sexual Medicine, 7, 2382-2387.

Bradbury, T. N., & Fincham, F. D. (1990). Attributions in marriage: Review and critique. Psychological Bulletin, 107, 3-33. doi: 10.1037/0033-2909.107.1.3

Bradbury, T. N., & Fincham, F. D. (1992). Attributions and behavior in marital interaction. Journal of Personality and Social Psychology, 63, 613-628.

Brewin, C., & Antaki, C. (1987). An analysis of ordinary explanations in clinical attribution research. Journal of Social and Clinical Psychology, 5, 79-98.

Brotto, L. (2010). The DSM diagnositc criteria for Hypoactive Sexual Desire Disorder in Women. Archives of Sexual Behavior, 39, 221-239.

Byers, E. (2005). Relationship satisfaction and sexual satisfaction: A longitudinal study of individuals in long-term relationships. Journal of Sex Research, 42, 113-118.

Carter, S., & Sokol, J. (1989). What really happens in bed: A demystification of sex. New York: Evans.

Clayton, A. H., Derogatis, L., Rosen, R., & Pyke, R. (2012). Intended or unintended consequences? The likely implications of raising the bar for sexual dysfunction diagnosis in the proposed DSM-V revisions: 2. For women with loss of subjective sexual arousal. Journal of Sexual Medicine, 9, 2040-2046.

Derogatis, L., Rosen, R., Leiblum, S., Burnett, A., & Heiman, J. (2002). The Female Sexual Distress Scale (FSDS): Initial validation of a standardized scale for assessment of sexually related personal distress in women. Journal of Sex & Marital Therapy, 28, 317-330.

Eagly, A. H., & Wood, W. (2005). Universal sex differences across patriarchal cultures does not equal evolved psychological dispositions. Behavioral and Brain Sciences, 28, 281-283.

Eddy, J. M., Heyman, R. E., & Weiss, R. L. (1991). An emperical evaluation of the Dyadic Adjustment Scale: Exploring the differences between marital "Satisfaction" and "Adjustment.". Behavioral Assessment, 13, 199-220.

Ferenidou, F., Kapoteli, V., Moisidis, K., Koutsogiannis, I., Giakoumelous, A., & Hatzichristou, D. (2008). Presence of a sexual problem may not affect women's satisfaction from their sexual function. Journal of Sexual Medicine, 5, 631-639.

Fichten, C. S., Spector, I., & Libman, E. (1988). Client attributions for sexual dysfunction. Journal of Sex & Marital Therapy, 14, 208-224.

Funk, J. L., & Rogge, R. D. (2007). Testing the ruler with item response theory: Increasing precision of measurement for relationship satisfaction with the Couples Satisfaction Index. Journal of Family Psychology, 21, 572-583.

Green, B. L. (1996). Trauma history questionnaire. In B. H. Stamm (Ed.), Measurement of stress, trauma, and adaptation (pp. 366-369). Lutherville: Sidran Press.

Hayes, R., Dennerstein, L., Bennet, C., & Fairley, C. (2008). What is the 'true' prevalence of female sexual dysfunctions and does the way we assess these conditions have an impact? Journal of Sexual Medicine, 5, 777-787.

Hayes, R., Dennerstein, L., Bennet, C., Sidat, M., Gurrin, L., & Fairley, C. (2008). Risk factors for female sexual dysfunction in the general population: Exploring factors associated with low sexual function and sexual distress. Journal of Sexual Medicine, 5, 1681-1693.

Hayes, R. D., Bennet, C., Fairley, C., & Dennerstein, L. (2006). What can prevalence studies tell us about female sexual difficulty and dysfunction? Journal of Sexual Medicine, 3, 589-595.

Heiman, J., & Meston, C. M. (1998). Empirically validated treatments for sexual dysfunction. In K. S. Dobson & K. D. Craig (Eds.), Empirically supported therapies: Best practices in professional psychology (pp. 259-303). New York, NY: Sage Publications.

Heinrich, A. G. (1976). The effect of group and self-directed behavioral-educational treatment of primary orgasmic dysfunction in females treated without their partners. Dissertation Abstracts International Section A: Humanities and Social Sciences, 37, 1902B.

Henderson, A. W., Lehavot, K., & Simoni, J. M. (2009). Ecological models of sexual satisfaction among lesbian/bisexual and heterosexual women. Archives of Sexual Behavior, 38, 50-65. doi: 10.1007/s10508-008-9384-3

Hendrick, S., Dicke, A., & Hendrick, C. (2002). The Relationship Assessment Scale. Journal of Social and Personal Relationships, 15, 137-142.

Hurlbert, D., Apt, C., & Rabehl, S. (1993). Key variables to understanding female sexual satisfaction: An examination of women in nondistressed marriages. Journal of Sex & Marital Therapy, 19, 154-165.

Kang, J., Laumann, E., Glaser, D. B., & Palik, A. (2005). Worldwide prevalence and correlates. In I. Goldstein, C. M. Meston, S. L. Davis & A. M. Traish (Eds.), Women's sexual function and dysfunction: Study, diagnosis, and treatment. New York, NY: Informa Healthcare.

Kaplan, H. S. (1995). Sexual desire disorders: Dysfunctional regulation of sexual motivation. New York, NY: Routledge.

Karney, B. R., & Bradbury, T. N. (1995). The longitudinal course of marital quality and stability: A review of theory, methods, and research. Psychological Bulletin, 118, 3-34. doi: 10.1037/0033-2909.118.1.3

Kenny, D. A., Korchmaros, J. D., & Bolger, N. (2003). Lower level mediation in multilevel models. Psychological Methods, 8, 115-128.

Killingsworth, M. A., & Gilbert, D. T. (2010). A wandering mind is an unhappy mind. Science, 330, 932.

King, M., Holt, V., & Nazareth, I. (2007). Women's Views of their Sexual Difficulties: Agreement and Disagreement with Clinical Diagnoses. Archives of Sexual Behavior, 36, 281-288.

Klusmann, D. (2006). Sperm competition and female procurement of male resources as explanations for a sex-specific time course in the sexual motivation of couples. Human Nature, 17, 283-300.

Laumann, E., Palik, A., & Rosen, R. (1999). Sexual dysfunction in the United States: Prevalence and predictors. Journal of The American Medical Association, 281, 537-544.

Lawrance, K., & Byers, E. (1992). Development of the interpersonal exchange model of sexual satisfaction in long term relationships. Canadian Journal of Human Sexuality, 1, 123-128.

Leiblum, S. R. (2007). Principles and practice of sex therapy (4th ed.). New York, NY US: Guilford Press.

Levine, L. J., & Safer, M. A. (2002). Sources of bias in memory for emotions. Current Directions in Psychological Science, 11, 169-173.

Lippa, R. A. (2009). Sex differences in sex drive, sociosexuality, and height across 53 nations: Testing evolutionary and social sctructural theories. Archives of Sexual Behavior, 38, 631-651.

Locke, H. J., & Wallace, K. M. (1959). Short marital-adjustment and prediction tests: Their reliability and validity. Marriage and Family Living, 21, 251-255.

MacNeil, S., & Byers, E. (1997). The relationships between sexual problems, communication, and sexual satisfaction. Canadian Journal of Human Sexuality, 6, 277-283.

Mah, K., & Binik, Y. M. (2001). The nature of human orgasm: A critical review of major trends. Clinical Psychology Review, 21, 823-856.

Masters, W., & Johnson, V. (1966). Human Sexual Response. Boston, MA: Little & Brown.

Masters, W., & Johnson, V. (1970). Human Sexual Inadequacy. Boston, MA: Little Brown.

McCabe, M. P. (2001). Evaluation of a cognitive behavior therapy program for people with sexual dysfunction. Journal of Sex & Marital Therapy, 27, 259-271.

Meston, C. (2003). Validation of the Female Sexual Function Index (FSFI) in women with female orgasmic disorder and in women with hypoactive sexual desire disorder. Journal of sex & marital therapy, 29(1), 39-46.

Meston, C., & Trapnell, P. (2005). Development and validation of a five-factor sexual satisfaction and distress scale for women: The Sexual Satisfaction Scale for Women (SSS-W). The Journal of Sexual Medicine, 2, 66-81.

Meston, C. M., & Buss, D. (2007). Why humans have sex. Archives of Sexual Behavior, 36, 477-507.

Meston, C. M., Hull, E., Levin, R. J., & Sipski, M. (2004). Women's orgasm. In T. F. Lue, R. Basson, R. Rosen, F. Guiliano, S. Khoury & F. Montorsi (Eds.), Sexual Medicine: Sexual Dysfunctions In Men and Women. Paris: Health Publications.

Meston, C. M., & Trapnell, P. (2005). Development and Validation of a Five-Factor Sexual Satisfaction and Distress Scale for Women: The Sexual Satisfaction Scale for Women (SSS-W). Journal of Sexual Medicine, 2, 66-81.

Mikulincer, M., & Shaver, P. (2003). The attachment behavioral system in adulthood: Activation, psychodynamics, and interpersonal processes. In M. P. Zanna (Ed.), Advances in experimental social psychology New York, NY: Academic Press.

Moore, D. R., & Heiman, J. R. (2006). Women's sexuality in context: Relationship factors and female sexual dysfunction. In I. Goldstein, C. M. Meston, S. R. Davis & A. M. Traish (Eds.), Women's Sexual Function and Dysfunction: Study, Diagnosis, and Treatment (Vol. 1, pp. 63-84). Oxford, UK: Taylor & Francis.

Morokoff, P., & Gillilland, R. (1993). Stress, sexual functioning, and marital satisfaction. Journal of Sex Research, 30, 43-53.

Mulhall, J., King, R., Glina, S., & Hvidsten, K. (2008). Importance of and satisfaction with sex among men and women worldwide: Rsules of the global better sex survey. Journal of Sexual Medicine, 5, 788-795.

Muller, D., Judd, C. M., & Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. Journal of Personality and Social Psychology, 89, 852-863.

Nelson, A. L., & Purdon, C. (2011). Non-erotic thoughts, attentional focus, and sexual problems in a community sample. Archives of Sexual Behavior, 40, 395-406. doi: 10.1007/s10508-010-9693-1

Norris, F. H., & Hamblen, J. L. (2004). Standardized self report measures of civilian trauma and posttraumatic stress disorder. In J. P. Wilson & T. M. Keane (Eds.), Assessing psychological trauma and PTSD (pp. 63-102). New York: The Guilford Press.

Oberg, K., & Fugl-Meyer, K. (2005). On Swedish women's distressing sexual dysfunctions: some concomitant conditions and life satisfaction. Journal of Sexual Medicine, 2, 169-180.

Petersen, J. L., & Hyde, J. (2010). A meta-analytic review of research on gender differences in sexuality. Psychological Bulletin, 136, 21-38.

Peterson, C., Semmel, A., von Baeyer, C., Abramson, L. Y., Metalsky, G., & Seligman, M. (1982). The attributional style questionnaire. Cognitive Therapy and Research, 6, 287-300.

Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., et al. (2000). The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. Journal of sex & marital therapy, 26, 191-208.

Rosen, R., Brown, C., J., H., Leiblum, S., Meston, C. M., & Shabsigh, R. (2000). The female sexual function index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. Journal of Sex & Marital Therapy, 26, 191-208.

Rosen, R., Leiblum, S., & Spector, I. (1994). Psychologically based treatment for male erectile disorder: A cognitive-interpersonal model. Journal of Sex & Marital Therapy, 20, 67-85.

Rosen, R., Shifren, J., Monz, B., Odom, D., Russo, P., & Johanes, C. (2009). Correlates of sexually related personal distress in women with low sexual desire. Journal of Sexual Medicine, 6, 1549-1560.

Sacco, W. P., & Beck, A. T. (1995). Cognitive theory and therapy. In E. E. Beckham & W. R. Leber (Eds.), Handbook of depression (2nd ed.). (pp. 329-351). New York, NY US: Guilford Press.

Sanders, S. A., Graham, C. A., & Milhausen, R. R. (2008). Predicting sexual problems in women: The relevance of sexual excitation and sexual inhibition. Archives of Sexual Behavior, 37, 241-251.

Sarwer, D. B., & Durlak, J. A. (1997). A field trial of the effectiveness of behavioral treatment for sexual dysfunctions. Journal of Sex & Marital Therapy, 23, 87-97.

Schmitt, D. P. (2005). Sociosexuality from Argentina to Zimbabwe: A 48-nation study of sex, culture, and strategies of human mating. Behavioral and Brain Sciences, 28, 247-311.

Shifren, J., Monz, B., Russo, P., Segreti, A., & Johanes, C. (2008). Sexual problems and distress in United States Women: Prevalence and correlates. Obstetrics & Gynecology, 112, 970-978.

Sibley, C., Fischer, R., & Liu, J. (2005). Reliability and Validity of the Revised Experiences in Close Relationships (ECR-R) Self-Report Measure of Adult Romantic Attachment. Personality and Social Psychology Bulletin, 31, 1524-1536.

Sibley, C., & Liu, J. (2004). Short-term temporal stability and factor structure of the revised experiences in close relationships (ECR-R) measure of adult attachment. Personality and Individual Differences, 36, 969-975.

Snyder, D., & Berg, P. (1983). Determinants of sexual dissatisfaction in sexually distressed couples. Archives of Sexual Behavior, 12, 237-245.

Spanier, G. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. Journal of Marriage & The Family, 38, 15-28.

Stephenson, K., & Meston, C. M. (2010). Differentiating components of sexual well-being in women: Are sexual satisfaction and sexual distress independent constructs? Journal of Sexual Medicine, 7, 2458-2468.

Stephenson, K. R., Hughan, C. P., & Meston, C. M. (2012). Childhood Sexual Abuse Moderates the Association Between Sexual Functioning and Sexual Distress in Women. Child Abuse & Neglect, 36, 180-189.

Stephenson, K. R., & Meston, C. M. (2010). When are sexual difficulties distressing for women? The selective protective value of intimate relationships. Journal of Sexual Medicine, 7, 3683-3694.

Stephenson, K. R., & Meston, C. M. (2012). The young and the restless? Age as a moderator of the association between sexual desire and sexual distress in women. Journal of Sex & Marital Therapy, 38, 464-476.

Stephenson, K. R., Rellini, A. H., & Meston, C. M. (2013). Relationship satisfaction as a predictor of treatment response during cognitive behavioral sex therapy. Archives of Sexual Behavior, 42, 143-152.

Stinson, R. (2009). The behavioral and cognitive-behavioral treatments of female sexual dysfunction: How far we have come and the path left to go. Sexual and Relationship Therapy, 24, 271-285.

Stravynski, A., Gaudette, G., Lesage, A., Arbel, N., Bounader, J., Lachance, L., et al. (2007). The treatment of sexually dysfunctional women with partner: A controlled study of three behavioral group approaches. Clinical Psychology and Psychotherapy, 14, 211-220.

Tiefer, L. (2001). A new view of women's sexual problems: Why new? Why now? Journal of Sex Research, 38, 89-96.

Tiefer, L., & Hall, M. (2010). A skeptical view of desire norms and disorders promotes clinical success. In S. Leiblum (Ed.), Treating sexual desire disorders: A clinical casebook (pp. 114-132). New York, NY: Guilford Press.

Trudel, G., Marchand, A., Ravart, M., Aubin, S., Turgeon, L., & Fortier, P. (2001). The effect of a cognitive-behavioral group treatment program on hypoactice sexual desire in women. Sexual & Relationship Therapy, 16, 145-164.

Weigel, M., Scekowski, L. A., & Barlow, D. H. (2005). Cognitive and affective processes in female sexual dysfunctions. In I. Goldstein, C. M. Meston, S. L. Davis & A. M. Traish (Eds.), Women's sexual function and dysfunction: Study, diagnosis, and treatment. New York, NY: Informa Healthcare.

Weisberg, R. B., Brown, T. A., Wincze, J. P., & Barlow, D. H. (2001). Causal attributions and male sexual arousal: The impact of attributions for a bogus erectile difficulty on sexual arousal, cognitions, and affect. Journal of Abnormal Psychology, 110, 324-334.

Wiegel, M., Meston, C., & Rosen, R. (2005). The female sexual function index (FSFI): cross-validation and development of clinical cutoff scores. Journal of sex & marital therapy, 31, 1-20.