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Beyond the Bedroom: Cognitive, Affective, and Behavioral Responses to Partner Touch in Women With and Without Sexual Problems

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Women with female sexual problems (FSP) are more likely than unaffected women to demonstrate negative appraisals, negative affect, and avoidance of sexual activity. Research suggests affected women also experience negative affect and avoidance in response to intimate partner contact for fear it will lead to sex. This online study examined whether women with FSP (N = 157) and without FSP (N = 129) exhibited different perceptions, affective reactions, and behavioral responses to hypothetical touch occurring outside sexual activity. Women (M_{age} = 30.70; SD = 6.66) were randomly assigned to one of three conditions representing hypothetical interactions with their partner (affectionate, sexual, or no touch), and answered questions about their perceptions of their partner's sexual intentions and their own anticipated negative affect and behavioral avoidance. Women with FSP reported higher perceptions of sexual intent, negative affect, and avoidance in the sexual touch condition, and higher negative affect in the affectionate touch condition, than women without FSP. Results highlight that women with FSP have more negative reactions to partners' hypothetical affectionate and sexual touch than women without FSP. Interventions for FSP may benefit from targeting women's perceptions, affective reactions, and behavioral reactions to partner touch when it occurs outside of explicitly sexual contexts.

Female sexual problems (FSP) refers to a broad category of sexual difficulties characterized by personally distressing disruptions to women's sexual function, including loss of sexual desire/interest, difficulties with arousal or orgasmic function, and genitopelvic pain (Shifren, Monz, Russo, Segreti, & Johannes, 2008). Prevalence estimates indicate that approximately 11% of women experience FSP and associated sexual distress (Mitchell et al., 2013; Shifren et al., 2008), with distressing problems with desire (8.9%), orgasm (3.4%), and arousal (3.3%) most frequently endorsed in nationally representative samples (Shifren et al., 2008). The etiology of FSP is multifactorial, with biological, psychological, and social factors all playing a role (Graziottin, Serafini, & Palacios, 2009).

Controlled studies demonstrate that women with FSP report lower sexual and relationship satisfaction, and greater

negative affect around their sexuality (Bergeron, Corsini-Munt, Aerts, Rancourt, & Rosen, 2015; Brauer, ter Kuile, Laan, & Trimbos, 2008; Brotto, Bitzer, Laan, Leiblum, & Luria, 2010; McCabe, 2005), although it is well documented that relationship quality may also contribute to the presence of FSP (Metz & Epstein, 2002). Moreover, FSP appear to negatively impact the intimate and sexual behaviors of affected women. Qualitative studies of women with sexual pain disorders have found that they report greater avoidance of affectionate and sexual physical contact with their romantic partners, as well as heightened distress surrounding expressions of intimacy (Ayling & Ussher, 2007; Hinchliff, Gott, & Wylie, 2012; Marriott & Thompson, 2008; Nappi, Kingsberg, Maamari, & Simon, 2013). While fewer studies have investigated these phenomena in women with other sexual problems, similar findings of distress and avoidance of intimate contact in women with low sexual desire have also been reported (Hinchliff et al., 2012). This avoidance of partner touch and the associated negative affect likely has consequences for women's relational well-being, given that touch from romantic partners plays a

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fundamental role in cultivating intimacy in couple relationships (Gallace & Spence, 2010).

Improving our understanding of the factors that contribute to FSP involves broadening our focus beyond what happens “between the sheets” to the experiences of women with FSP in nonsexual intimate contexts. However, little research has examined the responses of women with FSP to intimate, nonsexual partner interactions. This study fills this gap in knowledge by examining the cognitive, affective, and behavioral responses of women with FSP (compared to women without FSP) to interactions with their romantic partners which are not explicitly sexual but have the possibility of leading to sexual activity, such as when a partner expresses affection or sexual interest through touch.

Cognitive-Behavioral Model of Female Sexual Dysfunction

Barlow’s model of sexual dysfunction outlines the cognitive, affective, and behavioral responses of individuals with sexual dysfunctions to sexual stimuli (Barlow, 1986; Janssen, Everaerd, Spiering, & Janssen, 2000; Van Den Hout & Barlow, 2000; Wiegel, Scepkowski, & Barlow, 2007). Barlow’s model posits that perceived or explicit demands for sexual performance lead to negative expectancies, anxiety, and negative affect, which generate a hypervigilance toward sexual cues because they are appraised as threatening (Barlow, 1986). In turn, this negative appraisal results in a reduced focus on sexual cues (e.g., genital arousal) and an increased focus on nonsexual cues (e.g., performance demands), which further disrupts sexual function (Janssen et al., 2000; Wiegel et al., 2007). Growing empirical evidence supports the various elements of Barlow’s model in samples of women with FSP (Beard & Amir, 2010; Both, Laan, & Schultz, 2010; Lykins, Meana, & Minimi, 2011; Nelson & Purdon, 2011; Purdon & Watson, 2011). In particular, compared to sexually functional women, women with FSP report greater negative expectancies for sex, more negative appraisals of sexual cues, and higher negative affect in response to erotic stimuli (Brauer, De Jong, Huijding, Laan, & ter Kuile, 2009; Brauer, ter Kuile, & Laan, 2009; Cherner & Reissing, 2013; Cuntim & Nobre, 2014; Laan, Van Driel, & Van Lunsen, 2008). Furthermore, Barlow proposed that the repeated experience of disrupted sexual function may result in greater avoidance of future sexual situations in an attempt to cope with the anxiety generated by the sexual dysfunction (Barlow, 1986; Van Den Hout & Barlow, 2000; Wiegel et al., 2007). Studies of women with heterogeneous sexual dysfunctions and women with sexual pain disorders have demonstrated that affected women report significantly lower frequencies of sexual activity than unaffected women (Cherner & Reissing, 2013; Stephenson & Meston, 2012), with one British national survey indicating that 30.8% of women avoided sex because of sexual problems in their relationship (Mitchell et al., 2013).

The majority of the aforementioned studies examining the cognitive-behavioral model of sexual dysfunction in women have focused on women’s responses to explicit sexual stimuli (e.g., penetration attempts, recollections of their own experiences during sex, or observing erotic photos or videos; (Brauer, De Jong, et al., 2009; Brauer, ter Kuile, & Laan, 2009; Cherner & Reissing, 2013; Lykins et al., 2011; Purdon & Watson, 2011). To our knowledge, little attention has been directed toward understanding the responses of women with FSP in situations which are *not* explicitly sexual but have the potential of leading to sexual activity. In one cross-sectional study of a community sample of men and women in committed relationships, greater negative affect in anticipation of sexual activity was associated with lower sexual functioning (Nelson & Purdon, 2011). However, this study was not conducted in a sample of women reporting sexual problems, and the authors did not examine the behavioral responses (e.g., avoidance) of the participants. Qualitative studies find that women with vulvar pain or loss of sexual desire report negative affect and avoidance of intimate contact with partners for fear that it will lead to sexual activity (Hinchliff et al., 2012). As such, it is possible that women with FSP will report greater negative affect and behavioral avoidance than women without FSP in response to intimate interactions with romantic partners that are not explicitly sexual, such as the experience of being touched by a romantic partner.

Touch in Romantic Relationships

Touch in romantic relationships is known to foster intimacy, play a role in regulating emotion, and promote individuals’ health, well-being, and quality of life (Debrot, Schoebi, Perrez, & Horn, 2013; Gallace & Spence, 2010). In couples, touch is a primary means by which partners express affection for each other (e.g., hugging and kissing; Hertenstein, 2006) and is also a way that couples approach each other to initiate sexual activity, with one study demonstrating that touch was used as a sexual initiation cue by 77% of participants (Curtis, Eddy, Ashdown, Feder, & Lower, 2012).

However, the communicative function of touch in romantic relationships has received limited empirical attention. Affectionate touch is intended to express or elicit feelings of love (Gulledge, Gulledge, & Stahmann, 2003), while sexual touch is intended to express or elicit sexual interest (Hertenstein, 2006; Jones & Yarbrough, 1985). Touch is most often perceived as sexual when it involves holding and caressing touches (Jones & Yarbrough, 1985; Nguyen, Heslin, & Nguyen, 1975), yet these qualities also frequently characterize affectionate touch (Gulledge et al., 2003; Nguyen et al., 1975), contributing to some overlap between these two types of touch (Jones & Yarbrough, 1985). Body location appears to be one touch feature that can clarify the intent in a partner’s touch: Sexual touches are typically directed toward sexual body parts, such as the chest, pelvic area, or buttocks,

whereas affectionate touch is typically directed at body parts that are viewed as less sexual or nonsexual, such as the hands or arms (Jones & Yarbrough, 1985; Nguyen et al., 1975). In addition, sexual touch appears to be characterized by specific sequences of behavior, such as moving the hands from one body part to another, particularly sexual areas of the body (Jones & Yarbrough, 1985). It is possible that characteristics of the individual, such as experiencing difficulties with sexual functioning, influence their perceptions and responses to touch from a romantic partner. Specifically, women with FSP may be primed to interpret both affectionate and sexual touch from a partner as having more sexual intent than unaffected women.

Touch and Female Sexual Dysfunction

Qualitative reports from women with sexual pain disorders or loss of sexual desire suggest that touch from a partner may be met with anxious apprehension or avoidance (Ayling & Ussher, 2007; Hinchliff et al., 2012; Marriott & Thompson, 2008; Nappi et al., 2012). In a qualitative study, Hinchliff et al. (2012) found that women with either vulvar pain or low sexual desire tended to avoid situations they believed could result in sexual activity, such as cuddling with their partners. The women reported that even with affectionate behaviors, such as “giving a kiss and a cuddle,” they were preoccupied by the thought that this type of touch was a precursor to sexual activity. This response appears to center on the perceptions of these women that affectionate and/or sexual touch is an attempt to initiate sexual activity and is therefore associated with distress.

Touch represents an application of Barlow’s model to situations that include an implicit sexual cue. Because certain characteristics of sexual and affectionate touch are similar (e.g., holding/caressing, kissing; Jones & Yarbrough, 1985; Nguyen et al., 1975), in some situations the intention behind a romantic partner’s touch may be ambiguous. For example, although cuddling is primarily perceived as nurturing and nonsexual, it most frequently occurs in the context of sexual activity (Van Anders, Edelstein, Wade, & Samples-Steele, 2012). Women with FSP, who have demonstrated hypervigilance to sexual cues (Barlow, 1986), may be primed to interpret such ambiguous intimate touches as an indication of sexual interest from their partners.

When faced with a perceived sexual cue (e.g., touch), Barlow’s model suggests that women with FSP may appraise touch as threatening, thereby increasing negative affect such as anxiety and distress, which in turn may elicit a behavioral coping response that aims to decrease this negative affect: avoidance of their partner (Barlow, 1986; Wiegel et al., 2007). Consistent with operant conditioning theory, this avoidance acts as negative reinforcement, increasing the likelihood that such behavior will occur again in future situations (Hineline, 1977). One study of community couples provides preliminary evidence to suggest that physical partner touch may result in negative affect

for some women (Curtis et al., 2012). The authors found that 20% of women in the sample reported irritation in response to their partner’s sexual initiations and that this reaction occurred most often when partners used touch as a sexual initiation cue. This research is also consistent with the theoretical model underlying sensate focus, a sex therapy intervention which aims to reduce the anxious thoughts and feelings surrounding sexual touching that may inhibit sexual response (Linschoten, Weiner, & Avery-Clark, 2016).

In summary, despite strong theoretical, qualitative, and clinical reports pointing to disruptions around intimate partner touch in the context of sexual problems, a paucity of experimental research has examined how women with FSP interpret and respond to ambiguous interpersonal contexts that have the possibility of leading to sexual activity, such as the experience of being touched affectionately or sexually by their partners. Studying the responses of women with FSP to touch outside of the context of sexual activity could be important for improving our understanding of factors that contribute to the persistence of FSP and associated relationship difficulties.

Objectives and Hypotheses

The overall aim of this study was to examine the cognitive (i.e., perceptions of intent), affective, and behavioral responses of women with FSP to affectionate and sexual partner touch (compared to no touch), relative to a control group of women without FSP. To maximize internal and external validity, this study employed an experimental vignette design (Aguinis & Bradley, 2014; Hughes & Huby, 2004). The first objective was to examine whether group membership (i.e., FSP or no FSP) was differentially associated with women’s perceptions of sexual intent (i.e., their perceptions that their romantic partner’s touch was intended to express sexual interest), as well as their anticipated negative affective responses and behavioral avoidance to hypothetical partner interactions. We hypothesized that women with FSP would report perceptions of greater sexual intent, as well as anticipate higher negative affect and greater behavioral avoidance than women without FSP. The second objective was to examine whether the type of touch described in the vignettes moderated the associations between group membership and perceptions of sexual intent, affective responses, and behavioral responses. We hypothesized that, compared to sexually functional women, women with FSP would report higher perceptions of sexual intent, negative affect, and behavioral avoidance in response to hypothetical affectionate and sexual partner touch, relative to no partner touch. Given empirical evidence of associations between poor relationship quality and both negative affect and avoidance behaviors in romantic relationships (Graber, Laurenceau, Miga, Chango, & Coan, 2011; Osgarby & Halford, 2013; Purdon & Watson, 2011; Smith, Heaven, & Ciarrochi, 2008), we controlled for the influence of relationship satisfaction to examine the unique contribution of sexual problems to women’s

affective and behavioral responses to hypothetical interactions with their romantic partners.

METHOD

Participants

English-speaking women residing in the United States were recruited through Amazon Mechanical Turk (MTurk), which is an online recruitment source. Researchers have found MTurk samples to be more representative of the general population than undergraduate samples (for further detail, see reviews by Buhrmester, Kwang, and Gosling (2011) and Mason and Suri (2012)). To recruit an even number of women with and without FSP, two separate recruitment advertisements were posted: One recruited women who identified as having a sexual problem, and the second recruited women who identified as *not* having a sexual problem. Interested participants were then further screened for the presence/absence of sexual problems. All participants were also screened for eligibility to ensure that they (a) were of female sex and gender, (b) were between 18 and 45 years of age, as there are significant increases in the prevalence of sexual problems of women above 45 years of age (e.g., vaginal dryness relating to changes in menopausal status; Mitchell et al., 2013; Nappi et al., 2013; Shifren et al., 2008), (c) were in a self-defined committed romantic relationship, (d) engaged in sexual activity, defined as vaginal, manual, oral, or anal sex with their partner, within the past four weeks, and (e) were not currently pregnant or within one year postpartum.

A total of 396 women participated in this study. Participants were excluded from subsequent analyses if they (a) were found to have completed the survey twice ($n = 3$); (b) failed criteria for engaged attention (i.e., failed an attention check ($n = 8$) or had a response time greater than 50 minutes ($n = 2$; $M_{\text{response time}} = 26$ minutes); (c) did not answer all questions on measures of sexual function and distress ($n = 3$); or (d) had difficulty imagining any vignette scenario happening in their relationship (i.e., scored below 3 on a 7-point Likert scale; $n = 26$). Following completion of the study, the clinical cutoff scores for the measures of sexual function and sexual distress (see Measures section) were used to assign participants to the FSP or the no-FSP group. Participants who scored within the clinically significant range on measures of sexual function and distress were assigned to the FSP group ($n = 157$); participants who scored outside of the clinical range on both measures were assigned to the no-FSP group ($n = 129$). The remaining participants (i.e., those participants who met cutoffs for only one of the measures) were excluded from the analyses ($n = 68$). Our final sample included 286 participants. As shown in Table 1, participants in both groups were, on average, 30 years of age, had been in a relationship for approximately five years, and primarily identified as heterosexual. The majority of participants were born in the United

States, had an annual income between \$20,000 and \$80,000, and had an average of 15 years of education.

Procedure

This study was approved by our institution's human research ethics board. Through the study advertisement, women accessed an online survey, read an "invitation to participate" form, and provided informed consent to participate. Participants were screened for eligibility using questions with logic programming that terminated the survey for women deemed ineligible. Following the screening questions, eligible participants completed sociodemographic measures and were then randomized to one of the three conditions—sexual partner touch, affectionate partner touch, or no partner touch—which required them to read four vignettes describing different scenarios involving partner interactions, all depicting the same type of touch (see Experimental Manipulation section). Before participants were presented with the vignettes, they were prompted to imagine the situation occurring in their current relationship. Immediately following each vignette, participants responded to measures assessing their perceptions of their partner's sexual intent in each situation and their own negative affective and behavioral (i.e., avoidant) responses to the situation. Participants also answered three questions about their behavioral approach responses to the situation; however, the reliability of this measure was unacceptable.¹ They also completed the validity-check questions for each situation. Finally, two attention-check questions were embedded within the measures to verify that participants' attention was engaged during the study. Both attention-check questions asked participants to select a particular number on a Likert-type scale. Following the completion of the study, participants were taken to a debriefing page.

Experimental Manipulation. The vignettes in this study depicted four different scenarios describing an interaction between a woman and her romantic partner: (1) *Leaving an event together*, (2) *Getting dressed for a special event*, (3) *Waking up together in the morning*, and (4) *Woman reporting to her partner that she has cold hands*. For each scenario, the description of partner touch was manipulated to represent three different conditions: sexual partner touch, affectionate partner touch, and control (i.e., no partner touch). For example, the sexual touch condition was designed to represent sexual touch in isolation, and thus a description of affectionate partner touch was not included in these vignettes. *Scenarios* refer to the general context of the interaction between the woman and her romantic partner (e.g., leaving an event), whereas *vignettes* refer to the different touch conditions within each scenario (e.g., the sexual touch condition of the leaving an event scenario).

We selected vignettes from a larger set of scenarios piloted using an independent MTurk sample of 135 female participants. Twelve vignettes were developed for

Table 1. Sociodemographics for the No-FSP and FSP Groups

	No FSP (N = 129)	FSP (N = 157)	<i>t</i> or χ^2	BCa 95% CI [Lower Limit, Upper Limit]
Age (years)				
<i>M</i> (<i>SD</i>)	30.55 (7.02)	30.73 (6.31)	<i>t</i> (283) = -0.23, <i>p</i> = .82	[-1.77, 1.38]
Range	18–45	19–45		
Education level (years)				
<i>M</i> (<i>SD</i>)	15.46 (2.15)	15.77 (2.84)	<i>t</i> (283) = -1.02, <i>p</i> = .31	[-.90, .26]
Range	10–20	11–29		
Place of birth (<i>N</i> , %)				
United States	124 (96.1)	154 (98.1)	χ^2 (1) = 1.01, <i>p</i> = .32	—
Other	5 (3.9)	3 (1.9)		
Culture (<i>N</i> , %)				
American	121 (93.8)	144 (91.7)	χ^2 (1) = .45, <i>p</i> = .50	—
Other	8 (6.2)	13 (8.3)		
Annual income (<i>N</i> , %)				
\$0–\$19,999	12 (9.4)	23 (14.6)	χ^2 (5) = 6.23, <i>p</i> = .29	—
\$20,000–\$39,999	30 (23.4)	50 (31.8)		
\$40,000–\$59,999	39 (30.5)	36 (22.9)		
\$60,000–\$79,999	23 (18.0)	20 (12.7)		
\$80,000–\$99,999	15 (11.7)	17 (10.8)		
> \$100,000	9 (7.0)	11 (7.0)		
Sexual orientation (<i>N</i> , %)				
Heterosexual	104 (80.6)	132 (84.1)	χ^2 (1) = .59, <i>p</i> = .44	—
Other ^a	22 (19.4)	25 (15.9)		
Relationship length (months)				
<i>M</i> (<i>SD</i>)	60.76 (67.09)	69.90 (70.28)	<i>t</i> (283) = -1.12, <i>p</i> = .27	[-25.18, 6.73]
Range	2–320	1–336		

Note. BCa 95% CI = 95% bias-corrected and accelerated confidence interval (20,000 bootstrap resamples) for the mean difference.

^a “Other” includes participants identifying as homosexual, bisexual, and other.

the pilot study based on descriptive literature about what constitutes sexual and affectionate touch, such as qualities of touch (e.g., stroking) and body part location of the touch (e.g., breast, arm; Gullledge et al., 2003; Hanzal, Segrin, & Dorros, 2008; Hertenstein, 2006; Jones & Yarbrough, 1985; Nguyen et al., 1975). Based on the results of the pilot, four scenarios were selected for the current study because they had high external validity and because univariate analyses of variance (ANOVAs) and pairwise comparisons demonstrated significant differences in the expected direction for sexual intent and affectionate intent ratings between the three touch conditions (i.e., the sexual touch condition was rated as most sexual, and the affectionate touch condition was rated as most affectionate, relative to the other conditions). A summary of these pilot study results can be found on the last author’s Web site (Rancourt & Rosen, 2016).

In the present study, one of the piloted vignettes was dropped from the analysis (*Woman reporting cold hands to partner*) because preliminary analyses revealed that the manipulation was inconsistent with the pilot study results.² Table 2 shows the three vignette scenarios in the current study, manipulated based on condition.

Measures

Sociodemographics. A sociodemographics questionnaire collected information on participants’ sexual orientation,

partner’s sex and gender, length of the romantic relationship, education, income, ethnicity, and place of birth.

Sexual Function. The Female Sexual Functioning Index (FSFI; Rosen et al., 2000) was administered to determine the presence or absence of FSP among study participants. This 19-item measure evaluates six domains of sexual function (desire, arousal, lubrication, orgasm, satisfaction, and pain) over the past four weeks on a 5-point Likert scale. Scores are summed and range from 2 to 36, with lower scores indicating higher FSP. A clinical score ≤ 26.55 was used as a cutoff to indicate the presence of a FSP (Wiegel, Meston, & Rosen, 2005). This measure has high internal consistency and discriminant validity among several samples of women with sexual difficulties (Rosen et al., 2000; Wiegel et al., 2005). In this sample, Cronbach’s alpha was .96.

Sexual Distress. The Female Sexual Distress Scale—Revised (Derogatis, Clayton, Lewis-D’Agostino, Wunderlich, & Fu, 2008) was used to assess participants’ sexual distress. The scale includes 13 items measured on a 5-point Likert scale. Items are summed and total scores range from 0 to 52, with higher scores indicating a greater degree of sexual distress. A clinical score of ≥ 11 was used as a cutoff to indicate clinically relevant sexual distress (Derogatis, Pyke, McCormack, Hunter, & Harding, 2013). This measure has demonstrated high internal consistency and good discriminant validity

Table 2. *Vignette Scenarios, Manipulated Based on Condition*

Scenario	Affectionate	Sexual	Control
Leaving an event together	You and your partner are leaving a friend's dinner party late at night. As you reach your car, he puts his hand around your waist, pulls you toward him, and kisses you on the mouth. He tells you he had a great night with your friends, but that he can't wait to get home.	You and your partner are leaving a friend's dinner party late at night. As you reach your car, he pulls you toward him, kisses you on the mouth, and slides his hands down to your buttocks. He tells you he had a great night with your friends, but that he can't wait to get home.	You and your partner are leaving a friend's dinner party late at night. As you reach your car, he tells you he had a great night with your friends, but that he can't wait to get home.
Morning	It is a Saturday morning and you wake up to your partner stroking your side and nuzzling your neck. As you open your eyes, he tells you he thinks that today is going to be a great day.	It is a Saturday morning and you wake up to your partner stroking your thigh and stomach, and kissing your chest. As you open your eyes, he tells you he thinks that today is going to be a great day.	It is a Saturday morning and you wake up to your partner looking at you. As you open your eyes, he tells you he thinks that today is going to be a great day.
Getting dressed	You and your partner are getting ready to go out for a fancy occasion. You ask your partner for help zipping up your dress. As he finishes zipping you up, he caresses your shoulders, kisses you on the neck, and asks if you are ready now.	You and your partner are getting ready to go out for a fancy occasion. You ask your partner for help zipping up your dress. As he finishes zipping you up, he traces the back of your neck with his finger, slides his hands down toward your buttocks, and asks if you are ready now.	You and your partner are getting ready to go out for a fancy occasion. You ask your partner for help zipping up your dress. As he finishes zipping you up, he asks if you are ready now.

Note. In these vignettes, the pronouns used to refer to partners were modified according to the participants' preferences (i.e., male or female).

(Derogatis et al., 2008). In this sample, Cronbach's alpha was .97.

Perceived Sexual Intent. Three items were used to measure participants' perceptions of their partner's sexual intent. The items asked, "In this scenario, I would think that my partner is: (1) trying to initiate sexual activity with me; (2) interested in having sexual intercourse with me; (3) trying to show (s)he is sexually interested in me." Participants indicated their responses on a 7-point Likert scale (1 = *Strongly disagree* to 7 = *Strongly agree*). For each vignette, scores were summed so that total scores ranged from 3 to 21, with higher scores indicating greater perceptions of sexual intent. Cronbach's alpha for each scenario ranged from .93 to .97. Because perceived sexual intent was significantly correlated across the three scenarios ($r = .50$ to $.56$), we summed the scenario-specific scores to create a composite score (ranging from 9 to 63), with higher scores again indicating greater perceived sexual intent.

Anticipated Negative Affect. The measure of negative affect was adapted from the three-item negative affect subscale of the Sexual Activity and Affect Questionnaire (SAAQ; Nelson & Purdon, 2011), a measure of general negative affect in anticipation of partnered sexual activity. Three additional negative affective states were selected from the Profile of Mood States (i.e., *guilty*, *uneasy*; Shacham, 1983) and the Positive and Negative Affect Schedule (i.e., *distressed*; Watson, Clark, & Tellegen, 1988) because of their relevance to the sexual context in FSP. The instructions of our measure were adapted from the SAAQ so that

participants indicated their emotional response in reference to the vignette. In total, six items were administered that asked participants to rate the negative emotions they expected they would experience in response to the hypothetical scenario (*anxious*, *distressed*, *guilty*, *uneasy*, *nervous*, *sad*). Participants indicated the degree to which they would experience these negative emotions in response to the vignette using a 7-point Likert scale (1 = *Strongly disagree* to 7 = *Strongly agree*). Summed subscale scores for each scenario ranged from 6 to 42, with higher scores indicating higher negative affect, and Cronbach's alphas for the scenarios ranged from .92 to .93. Negative affect was significantly correlated across the three scenarios ($r = .72$ to $.80$), and so a composite score was derived for negative affect (range: 18 to 126).

Anticipated Behavioral Avoidance. Our measure of behavioral avoidance was created based on a review of qualitative studies and clinical reports of avoidance in the context of vulvar pain and loss of sexual desire (Hinchliff et al., 2012; Marriott & Thompson, 2008). Three items were used: "In this scenario, I would respond to my partner by: (1) physically withdrawing from him/her; (2) trying to shift the focus or change the topic; (3) trying to find a way to end the interaction." Participants indicated the degree to which they anticipated they would respond with avoidance to each vignette on a 7-point Likert scale (1 = *Strongly disagree* to 7 = *Strongly agree*). Summed total scores for each scenario ranged from 3 to 21, with higher scores indicating greater avoidance and Cronbach's alphas for the scenarios ranged from .91 to .95. As avoidance scores were significantly

correlated across the three vignettes ($r = .58$ to $.63$), we derived a composite score ranging from 9 to 63.

Validity Check. Following each vignette, women were asked to indicate the degree to which they agreed with one item—"It was easy for me to imagine this scenario occurring in my current relationship"—on a 7-point Likert scale (1 = *Strongly disagree* to 7 = *Strongly agree*).

Relationship Satisfaction. The four-item scale of the Couple Satisfaction Index (CSI) (Funk & Rogge, 2007) was used to assess participants' relationship satisfaction. The CSI consists of three items on a 6-point Likert scale (0 = *Not at all* to 5 = *Completely*; e.g., "How rewarding is your relationship with your partner?"), and one item on a 7-point scale (0 = *Extremely unhappy* to 6 = *Perfect*; "Please indicate the degree of happiness, all things considered, of your relationship"). Items are summed, and total scores range from 0 to 21, with higher scores indicating greater relationship satisfaction. This measure has demonstrated strong convergent and construct validity (Funk & Rogge, 2007). In this sample, Cronbach's alpha was .94.

Data Analysis

All analyses were conducted in SPSS, Version 22 (IBM Software Group). Prior to analyses, data were screened for normality assumptions and outliers using histograms, P-P plots, box plots, and skewness/kurtosis values. Because many variables were nonnormally distributed, standard errors (SEs) and confidence intervals (CIs) for all analyses were calculated using bias-corrected and accelerated bootstrapping with 20,000 resamples. Bootstrapping is robust to violations of normality assumptions (Hesterberg, Moore, Monaghan, Clipson, & Epstein, 2005). Group differences on sociodemographic variables were analyzed using independent sample t tests for continuous variables and Pearson chi-square tests for categorical variables. Pearson correlations were computed between relationship satisfaction and perceived sexual intent, negative affect, and behavioral avoidance; if relationship satisfaction was correlated with these outcomes higher than $r = .30$, it was included as a covariate in the model (Frigon & Laurencelle, 1993).

To test the effect of group membership on perceptions of sexual intent, negative affect and behavioral avoidance, as well as the moderating effect of vignette touch condition on these associations, we used a bootstrapped hierarchical multiple regression. The outcome variables were perceived sexual intent (Model 1), negative affect (Model 2) and behavioral avoidance (Model 3). For Models 2 and 3, relationship satisfaction was entered in the first step of the model. Independent variables were entered in the second step, including dummy-coded group membership (no FSP = 0; FSP = 1), dummy-coded experimental touch condition with the control condition as the reference category, and all possible two-way interactions. This analysis is

mathematically equivalent to a 2×3 factorial analysis of covariance (ANCOVA); however, due to limitations of SPSS software, bootstrapping is not implemented for the overall F tests in ANCOVA. Thus, we used the REGRESSION procedure in SPSS to ensure that p values and SEs were properly calculated.

RESULTS

Descriptive Statistics and Correlations

Results of the t test and chi-square analyses revealed no significant differences between the FSP and no-FSP group on any sociodemographic characteristics (see Table 1). As expected, the FSP group reported significantly lower overall sexual function and domain-specific sexual function (desire, arousal, lubrication, orgasm, satisfaction, and pain), as well as significantly higher sexual distress, than the no-FSP group (see Table 3). In addition, the FSP group reported significantly lower relationship satisfaction than the no-FSP group (see Table 3). Table 4 shows the means and standard deviations of perceived sexual intent, negative affect, behavioral avoidance, and validity scores by touch condition and group. There were no significant differences between groups in the ease with which they could imagine the scenarios occurring in their relationship ($b = -.83$, $SE = .50$, $p = .09$, BCa 95% CI [-1.80, 0.14]). Pearson correlations between relationship satisfaction and the dependent variables of negative affect, behavioral avoidance, and perceived sexual intent indicated that relationship satisfaction had a moderate, negative association with negative affect ($r = -.38$, $p < .01$, BCa 95% CI [-0.49, -0.26]) and with behavioral avoidance ($r = -.39$, $p < .01$, BCa 95% CI [-0.50, -0.28]), and was unrelated to perceived sexual intent ($r = .07$, $p = .22$, BCa 95% CI [-0.53, 0.20]). As such, relationship satisfaction was entered as a covariate only for the models on negative affect and avoidance (Frigon & Laurencelle, 1993).

Effects of FSP and Touch Condition on Sexual Intent, Negative Affect, and Avoidance

Our first objective was to examine whether women with FSP reported greater perceived sexual intent, negative affect, and behavioral avoidance in response to hypothetical partner interactions than women without FSP. Our second objective was to examine whether vignette touch condition moderated the associations between FSP and perceived sexual intent, negative affect, and behavioral avoidance; bs , SEs, and 95% bootstrapped CIs for all parameters are presented in Table 5. The overall model on perceived sexual intent was significant, $F(5, 285) = 52.03$, $p < .001$, and accounted for 48.2% of the variance in perceived sexual intent. The overall model on negative affect, controlling for relationship satisfaction, was significant, $F(6, 285) = 23.19$, $p < .001$, and accounted for 33.3% of the variance in negative affect.

Table 3. Measures of Sexual Dysfunction, Sexual Distress, and Relationship Satisfaction for the No FSP and FSP Groups

	No FSP (N = 129)	FSP (N = 157)	t	BCa 95% CI [Lower Limit, Upper Limit]	Cohen's d
Female Sexual Function					
Index (FSFI)					
M (SD)	31.79 (2.42)	20.04 (4.66)	t (243.69) = 27.38, p < .001	[10.91, 12.58]	3.51
Range	26.6–36.0	7.6–26.5			
FSFI desire subscale					
M (SD)	4.48 (0.98)	3.05 (1.08)	t (284) = 11.65, p < .001	[1.19, 1.67]	1.40
Range	2.4–6.0	1.2–6.0			
FSFI arousal subscale					
M (SD)	5.29 (0.70)	2.88 (1.11)	t (266.04) = 22.31, p < .001	[2.20, 2.62]	2.74
Range	3.6–6.0	1.2–5.7			
FSFI lubrication subscale					
M (SD)	5.63 (0.48)	3.68 (1.40)	t (199.24) = 16.36, p < .001	[1.73, 2.19]	2.32
Range	3.6–6.0	1.2–6.0			
FSFI orgasm subscale					
M (SD)	5.22 (0.95)	2.84 (1.32)	t (279.13) = 17.71, p < .001	[2.12, 2.65]	2.12
Range	1.6–6.0	1.2–6.0			
FSFI satisfaction subscale					
M (SD)	5.50 (0.60)	3.40 (1.19)	t (239.87) = 19.29, p < .001	[1.89, 2.32]	2.49
Range	2.4–6.0	1.2–6.0			
FSFI pain subscale					
M (SD)	5.64 (0.77)	4.20 (1.59)	t (234.60) = 10.03, p < .001	[1.16, 1.73]	1.31
Range	1.2–6.0	0–6.0			
Female Sexual Distress					
Scale					
M (SD)	2.34 (3.02)	28.11 (10.53)	t (186.66) = 29.24, p < .001	[-27.50, -24.05]	4.28
Range	0–10	11–52			
Couple Satisfaction Index					
M (SD)	17.33 (2.82)	13.82 (4.20)	t (273.51) = 8.40, p < .001	[2.70, 4.34]	1.02
Range	9–21	0–21			

Note. BCa 95% CI = 95% bias-corrected and accelerated confidence interval (20,000 bootstrap resamples) for the mean difference.

Finally, the overall model on behavioral avoidance, controlling for relationship satisfaction, was also significant, $F(6, 285) = 24.12, p < .001$, accounting for 34.1% of the variance in behavioral avoidance.

Objective 1: Main Effect of FSP on Sexual Intent, Negative Affect, and Avoidance

Results did not reveal a main effect of group on women’s perceived sexual intent (see Table 5). For negative affect and behavioral avoidance, results revealed main effects of group such that women with FSP reported greater negative affect and higher behavioral avoidance across all touch conditions than women without FSP (see Table 5).

Objective 2: Moderating Role of Touch in the Effect of FSP on Sexual Intent, Negative Affect, and Avoidance

There was a main effect of touch condition on women’s perceived sexual intent, such that participants perceived that their partner’s sexual intent was highest in the sexual touch condition, followed by the affectionate touch condition, and the no-touch condition. Touch condition also significantly

moderated the association between group and perceived sexual intent: Compared to women without FSP, those with FSP reported significantly higher perceived sexual intent in the sexual touch condition relative to the no-touch condition, but not in the affectionate touch condition relative to the no-touch condition (see Table 5 and Figure 1A).

There was no main effect of touch condition on women’s negative affect. However, touch condition significantly moderated the association between group and negative affect: Compared to women without FSP, those with FSP reported higher negative affect in both the sexual and affectionate touch conditions relative to the no-touch condition (see Table 5 and Figure 1B).

There was a main effect of touch condition on behavioral avoidance such that, for all women, behavioral avoidance was greater in the sexual touch condition than the no-touch condition. Finally, touch condition significantly moderated the association between group and behavioral avoidance: Compared to women without FSP, those with FSP reported higher avoidance in the sexual touch condition relative to the no-touch condition, but not in the affectionate touch condition relative to the no-touch condition (see Table 5 and Figure 1C).

Table 4. Means for Perceived Sexual Intent, Negative Affect, Behavioral Avoidance, and Vignette Validity by Group and Touch Condition

Variable	Affectionate Touch Condition				No-Touch Condition				Sexual Touch Condition			
	No FSP		FSP		No FSP		FSP		No FSP		FSP	
	<i>M (SD)</i>	BCa 95% CI [LL, UL]	<i>M (SD)</i>	BCa 95% CI [LL, UL]	<i>M (SD)</i>	BCa 95% CI [LL, UL]	<i>M (SD)</i>	BCa 95% CI [LL, UL]	<i>M (SD)</i>	BCa 95% CI [LL, UL]	<i>M (SD)</i>	BCa 95% CI [LL, UL]
Perceived sexual intent	43.95 (10.78)	[40.47, 47.21]	42.15 (10.57)	[39.21, 44.98]	30.48 (11.03)	[27.38, 33.68]	26.93 (11.47)	[23.94, 29.90]	49.50 (8.06)	[46.98, 51.88]	52.90 (7.38)	[50.76, 54.93]
Negative affect	20.29 (4.42)	[19.09, 21.68]	40.45 (22.09)	[34.84, 46.40]	19.35 (2.73)	[18.69, 20.13]	33.80 (18.34)	[29.36, 38.70]	20.38 (3.91)	[19.34, 21.59]	44.92 (24.94)	[38.46, 51.88]
Behavioral avoidance	10.71 (3.84)	[9.70, 11.93]	20.17 (12.91)	[16.88, 23.74]	9.63 (1.79)	[9.21, 10.15]	17.93 (10.96)	[15.33, 20.76]	12.79 (6.08)	[11.14, 14.66]	26.82 (13.45)	[23.14, 30.63]
Vignette validity	19.20 (2.32)	[18.42, 19.87]	17.66 (3.00)	[16.83, 18.45]	18.87 (2.38)	[18.15, 19.55]	18.04 (2.52)	[17.34, 18.70]	18.48 (2.97)	[17.52, 19.35]	17.71 (3.20)	[16.76, 18.61]

Note. *N* = 286. BCa 95% CI = 95% bias-corrected and accelerated confidence interval (20,000 bootstrap resamples); LL = lower limit; UL = upper limit.

Table 5. *Effects of Group and Touch Condition on Women's Perceived Sexual Intent, Negative Affect, and Behavioral Avoidance*

Models	<i>b</i>	SE	<i>p</i>	BCa 95% CI [LL, UL]
<i>Model 1: Perceived sexual intent</i>				
Step 1				
Intercept	30.48	1.63	< .001	[27.36, 33.76]
Group ^a	-3.55	2.23	.11	[-7.88, 0.75]
Affectionate condition ^b	13.47	2.34	< .001	[8.64, 17.96]
Sexual condition 2 ^c	19.02	2.05	< .001	[14.86, 23.02]
Group × Affectionate	1.75	3.15	.58	[-4.44, 8.10]
Group × Sexual	6.95	2.75	.01	[1.56, 12.40]
<i>Model 2: Negative affect</i>				
Step 1				
Intercept	58.39	5.76	< .001	[47.93, 70.00]
Relationship satisfaction	-1.80	.33	< .001	[-2.49, -1.17]
Step 2				
Intercept	39.32	6.19	< .001	[28.32, 51.51]
Relationship satisfaction	-1.15	.35	.001	[-1.90, -0.47]
Group ^a	8.76	2.36	< .001	[4.14, 13.44]
Affectionate condition 1 ^b	0.99	1.13	.37	[-1.21, 3.27]
Sexual condition 2 ^c	0.99	0.99	.31	[-0.90, 2.92]
Group × Affectionate	8.26	3.81	.03	[0.78, 15.73]
Group × Sexual	12.54	4.19	.004	[4.52, 20.79]
<i>Model 3: Behavioral avoidance</i>				
Step 1				
Intercept	33.47	3.27	< .001	[27.37, 39.96]
Relationship satisfaction	-1.09	.19	< .001	[-1.47, -0.73]
Step 2				
Intercept	23.26	3.44	< .001	[17.04, 30.02]
Relationship satisfaction	-.79	.20	< .001	[-1.19, -0.41]
Group ^a	4.41	1.36	.002	[1.84, 7.03]
Affectionate condition 1 ^b	1.11	.81	.17	[-0.39, 2.78]
Sexual condition 2 ^c	3.13	.97	.002	[1.40, 5.03]
Group × Affectionate	2.91	2.28	.21	[-1.57, 7.34]
Group × Sexual	7.41	2.45	.004	[2.47, 12.24]

Note. BCa 95% CI = 95% bias-corrected and accelerated confidence interval (20,000 bootstrap resamples); LL = lower limit; UL = upper limit.

^a Group: No FSP coded as 0; FSP coded as 1.

^b Affectionate: Dummy-coded so that 0 represents the no-touch or sexual touch conditions and 1 represents the affectionate touch condition.

^c Sexual: Dummy-coded so that 0 represents the no-touch or affectionate touch conditions and 1 represents the sexual touch condition.

DISCUSSION

This study examined the perceptions of sexual intent, anticipated negative affect, and anticipated behavioral avoidance of women with FSP in response to hypothetical affectionate and sexual touch from a romantic partner (compared to no touch), relative to a control group of women without FSP. In line with our hypotheses, women with FSP reported higher perceived sexual intent than women without FSP in response to situations depicting their partners' sexual touch, compared to no touch. Controlling for relationship satisfaction, women with FSP reported higher anticipated negative affect in response to situations depicting their partners' affectionate and sexual touch relative to situations of no touch, and greater anticipated behavioral avoidance in response to situations depicting their partners' sexual touch compared to no touch. Inconsistent with our hypotheses, women with FSP did not report significantly higher perceived sexual intent, nor behavioral avoidance, in response to situations involving hypothetical affectionate touch from

their romantic partners. Findings are in line with prior research highlighting the negative perceptions and responses of women with FSP to explicit sexual cues (Brauer, De Jong, et al., 2009; Brauer, ter Kuile, & Laan, 2009; Cherner & Reissing, 2013; Cuntim & Nobre, 2014; Laan et al., 2008), and extend this work to a novel and relevant context in FSP: the experience of being touched by a partner, as represented in hypothetical situations of touch in women's own relationships.

In qualitative studies, women with sexual pain disorders or loss of sexual desire report distress and avoidance of physical contact with partners (e.g., kissing, hugging) because they fear it will lead to actual sexual activity (Hinchliff et al., 2012; Marriott & Thompson, 2008). Our results add preliminary quantitative support to these reports, indicating that women with FSP reported significantly higher perceptions of sexual intent in response to partners' hypothetical sexual touch (relative to no touch) compared to women without FSP. However, it is worth noting that these results are tenuous given the absence of a main effect of

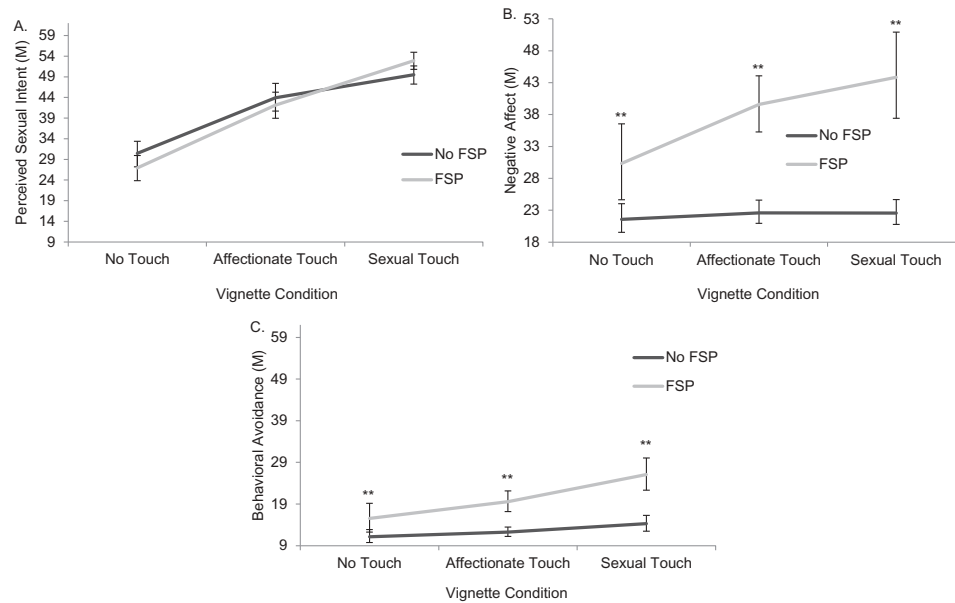


Figure 1. The effects of group, with or without female sexual problems (FSP) and vignette condition on (A) perceived sexual intent, (B) negative affect (controlling for relationship satisfaction), and (C) behavioral avoidance (controlling for relationship satisfaction); $**p < .01$.

group on perceived sexual intent, as well as the absence of a moderating effect of partners' hypothetical affectionate touch on this main effect. Without the benchmark of partners' actual intentions, it is not possible to know how accurate women were in their perceptions of partners' sexual intent. However, relative to women without FSP and in comparison to situations that did not involve partner touch, it is possible that women with FSP exhibit an attentional bias or hypervigilance to cues that are appraised as threatening to women with FSP, such as the possibility of a sexual advance (Beard & Amir, 2010; Van Den Hout & Barlow, 2000). Future research is warranted to better understand the potential mechanisms behind these higher ratings of partners' sexual intent, specifically to sexual touch, among women with FSP.

In response to hypothetical sexual touch from women's own romantic partners, compared to no touch, women with FSP also reported greater negative affect and behavioral avoidance than women without FSP. Importantly, these findings occurred above and beyond the effect of women's relationship satisfaction on these variables, which in previous research has been related to negative affective responses and relationship avoidance behaviors (Graber et al., 2011; Osgarby & Halford, 2013; Purdon & Watson, 2011). This suggests that the observed associations are not simply due to variations in general relationship satisfaction, which may be bidirectionally related to FSP (Metz & Epstein, 2002). Theoretical and empirical literature on Barlow's model of sexual dysfunction has demonstrated that women with FSP negatively appraise sexual cues, which results in negative affective and behavioral responses, such as avoidance (Barlow, 1986; Cherner & Reissing, 2013; Hinchliff et al., 2012; Laan et al., 2008; Mercer

et al., 2003; Wiegel et al., 2007). The current findings are consistent with this literature and substantiate women's qualitative reports of distress and attempts to avoid sexual contact with partners outside of the context of actual sexual activity (Hinchliff et al., 2012; Marriott & Thompson, 2008). Coupled with the findings for sexual intent, these results extend existing research by suggesting that, to women with FSP, sexual touch occurring outside of the context of actual sexual activity, such as caressing the buttocks, may represent a sexual cue that elicits feelings of anxiety, guilt, or distress and attempts to withdraw from a partner. For women with FSP, some of whom report feelings of shame, guilt, and inadequacy as romantic and sexual partners relating to their loss of sexual desire or vulvar pain (Ayling & Ussher, 2007; Hinchliff et al., 2012), feeling anxious or distressed by partners' sexual touch and withdrawing from such interactions may exacerbate the sexual problem (Wiegel et al., 2007), and disrupt couples' intimacy and relational well-being (Gallace & Spence, 2010).

In contrast to sexual touch, our results showed that hypothetical affectionate touch from a partner unexpectedly did not moderate the effect of FSP group membership on women's perceptions of sexual intent or behavioral avoidance but did moderate the effect of a FSP on negative affective responses. That is, relative to the no-touch condition, women with FSP reported greater negative affect in response to hypothetical affectionate touch from their partner than did women without FSP. These findings are again in line with qualitative studies indicating that women with vulvar pain or a loss of sexual desire experience anxiety and distress not just with sexual contact with their partners but also with affectionate contact (Hinchliff et al., 2012; Marriott & Thompson, 2008). Participants perceived the

highest sexual intent in the sexual touch condition, followed by the affectionate touch condition, and the no-touch condition, underscoring the possible ambiguity of affectionate touch in this study relative to the other two vignette conditions. It may be that the affectionate touch depicted in this study was not perceived to be threatening enough to trigger the avoidance response that has been reported in the FSP literature (i.e., the effect was weaker because the affectionate touch condition was less threatening than the sexual touch condition). Therefore, while women with FSP in this study reported greater anxiety and distress in response to affectionate touch from their partners, the ambiguity behind partners' intentions during these affectionate interactions may prevent women from behaviorally withdrawing from their partners' affection—perhaps to see how the interaction unfolds.

The limitations of this study are important to note. First, due to the online design, group categorization (FSP or no FSP) was based on self-report measures. Despite noted psychometric strengths (Rosen et al., 2000; Wiegel et al., 2005), the FSFI has received critiques due to theoretical and psychometric concerns regarding the measurement of sexual desire and sexual functioning in sexually inactive samples (Forbes, Baillie, & Schniering, 2014; Meyer-Bahlburg & Dolezal, 2007). As such, only women engaging in sexual activity within the past four weeks were eligible to participate. Further, women were not asked to provide information about the severity or duration of their sexual problems or any clinical diagnoses they had received. These factors may limit the generalizability of our findings to women with a clinically diagnosed sexual dysfunction or more severe sexual problems that lead to enduring avoidance of partnered sexual activity. Second, to measure our dependent variables, this study utilized several author-created measures, which were not independently validated. Of note, one item on our measure of perceived sexual intent utilized heteronormative phrasing (i.e., "sexual intercourse"). A final limitation was that this study did not evaluate the real-time perceptions and affective and behavioral responses of women with FSP to intimate partner interactions involving touch. As sexual and affectionate touching can share features (Jones & Yarbrough, 1985), it is possible that attempting to separate affectionate and sexual touch in the hypothetical scenarios restricted the authenticity of the vignettes, or introduced confounds into the design (e.g., differences in tone between the affectionate and sexual vignettes).

This study also had several strengths. The vignettes were developed based on empirical research that has described the characteristics of sexual and affectionate touch (e.g., qualities of the touch, body part locations that are touched). Prior to being used in this research, the vignettes were also piloted in a separate sample to evaluate the effectiveness of the manipulations. In addition, this study sheds light on a theoretically and clinically relevant aspect of the experiences of women with FSP by examining the responses of women with FSP to partner touch occurring outside of the context of sexual activity. Distress and avoidance of partner

touch are commonly mentioned in qualitative studies of women with FSP (Hinchliff et al., 2012; Marriott & Thompson, 2008) and are also represented in the sex and couples therapy literature (Both et al., 2010), yet these phenomena have rarely been quantitatively evaluated. Importantly, our findings demonstrate that the consequences of FSP extend beyond the walls of the bedroom to also impact the ways that women with FSP may respond in hypothetical representations of common intimate contexts, such as being touched in an affectionate or sexual way by their partners. Given the host of emotional consequences that accompany behavioral avoidance of intimacy in women with FSP, such as feelings of inadequacy, shame, and guilt (Ayling & Ussher, 2007; Hinchliff et al., 2012; Marriott & Thompson, 2008), the field of sex research would benefit from continuing to examine the experiences of women with FSP in these broader relational contexts.

Replicating the findings of this study using alternative study designs that capture women's real-life experiences (e.g., the natural overlap between affectionate and sexual touch) and potential variations across partner interactions, such as ecological momentary assessment (Shiffman, Stone, & Hufford, 2008), would strengthen our confidence in these results. In addition, future research might examine perceptions and responses to intimate touch within a dyadic context, whereby both women's and partners' reports are examined. Such studies would enhance understanding of how negative affective and behavioral reactions among women with FSP reciprocally impact the romantic partners who are initiating the touch (e.g., partners' reactions to women's distress or withdrawal). In addition, including both members of the couple would allow researchers to measure partners' actual sexual intentions, thereby clarifying the accuracy of women's perceptions of their partners' sexual intent in the context of ambiguous touch. Finally, it will be important to examine whether women's responses to partner touch differ depending on the nature of their sexual problem.

A growing body of literature underscores the beneficial effects of touch for individuals and romantic relationships (Gallace & Spence, 2010; Hertenstein, 2006). The current findings suggest that targeting touch as a component of psychological interventions for difficulties with female sexual functioning may be beneficial. Women and couples coping with the impact of FSP may benefit from interventions to reduce the negative feelings and withdrawal behaviors that are elicited when their partners touch them affectionately or sexually outside of explicit sexual activity, such as when a partner caresses a woman's buttocks or kisses her neck. Clinicians may support couples' open, effective communication about their touch preferences and encourage couples' awareness of the touch sensitivities that individual partners might hold (e.g., the dislike of particular forms of sexual touch outside of a sexual context). In addition, clinicians may facilitate couples' communication about the meaning and interpretation of their touch behaviors, helping to clarify when touch represents a

REFERENCES

sexual initiation versus an expression of affection. Improving couples' interactions involving touch may help restore intimacy and affection in their relationship, which is likely to play a pivotal role in couples' well-being and satisfaction with their relationship (Debrot et al., 2013; Gallace & Spence, 2010).

Clinical and qualitative findings of women with sexual problems, such as vulvodynia and loss of sexual desire, indicate anxious apprehension, distress, and avoidance of intimate physical touch with partners (e.g., kissing) for fear that touching represents a precursor to sexual activity (Hinchliff et al., 2012). Overall, results of the current study provide quantitative evidence in support of the theory that women with FSP perceive their partners' hypothetical, nonexplicit sexual touches to be a sexual initiation cue and that they anticipate experiencing negative affect and avoidance in response. In contrast, the pattern of results for affectionate touch provided only weak support for the theory that women with sexual problems avoid affectionate touch because they are concerned that it might lead to sexual activity, but does provide evidence that women with sexual problems may experience distress in such situations. Our findings emphasize the importance of intervening around couples' touch behaviors in psychosocial treatments for female sexual problems.

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NOTES

1. The approach items used can be acquired by contacting the study authors.
2. Contrary to the pilot study, respondents in the current study reported higher sexual intent in the no-touch control condition, pilot: $M(SD) = 8.26(5.58)$; current study: $M(SD) = 11.73(6.02)$, which impacted the manipulation, in that mean ratings of sexual intent were similar between the no-touch and the affectionate touch conditions, $M(SD) = 10.83(5.25)$.

- Aguinis, H., & Bradley, K. J. (2014). Best practice recommendations for designing and implementing experimental vignette methodology studies. *Organizational Research Methods, 17*, 351–371. doi:10.1177/1094428114547952
- Ayling, K., & Ussher, J. M. (2007). "If sex hurts, am I still a woman?" The subjective experience of vulvodynia in heterosexual women. *Archives of Sexual Behavior, 37*, 294–304. doi:10.1007/s10508-007-9204-1
- Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology, 54*, 140–148. doi:10.1037/0022-006X.54.2.140
- Beard, C., & Amir, N. (2010). Attention bias for sexual words in female sexual dysfunction. *Journal of Sex and Marital Therapy, 36*, 216–226. doi:10.1080/00926231003719616
- Bergeron, S., Corsini-Munt, S., Aerts, L., Rancourt, K., & Rosen, N. O. (2015). Female sexual pain disorders: A review of the literature on etiology and treatment. *Current Sexual Health Reports, 7*(3), 159–169. doi:10.1007/s11930-015-0053-y
- Both, S., Laan, E., & Schultz, W. W. (2010). Disorders in sexual desire and sexual arousal in women, a 2010 state of the art. *Journal of Psychosomatic Obstetrics and Gynecology, 31*, 207–218. doi:10.3109/0167482X.2010.528628
- Brauer, M., De Jong, P. J., Huijding, J., Laan, E., & ter Kuile, M. M. (2009). Automatic and deliberate affective associations with sexual stimuli in women with superficial dyspareunia. *Archives of Sexual Behavior, 38*, 486–497. doi:10.1007/s10508-008-9367-4
- Brauer, M., ter Kuile, M. M., & Laan, E. (2009). Effects of appraisal of sexual stimuli on sexual arousal in women with and without superficial dyspareunia. *Archives of Sexual Behavior, 38*, 476–485. doi:10.1007/s10508-008-9371-8
- Brauer, M., ter Kuile, M. M., Laan, E., & Trimbos, B. (2008). Cognitive-affective correlates and predictors of superficial dyspareunia. *Journal of Sex and Marital Therapy, 35*, 1–24. doi:10.1080/00926230802525604
- Brotto, L. A., Bitzer, J., Laan, E., Leiblum, S., & Luria, M. (2010). Women's sexual desire and arousal disorders. *Journal of Sexual Medicine, 7*, 586–614. doi:10.1111/j.1743-6109.2009.01630.x
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data?. *Perspectives on Psychological Science, 6*, 3–5. doi:10.1177/1745691610393980
- Cherner, R. A., & Reissing, E. D. (2013). A comparative study of sexual function, behavior, and cognitions of women with lifelong vaginismus. *Archives of Sexual Behavior, 42*, 1605–1614. doi:10.1007/s10508-013-0111-3
- Cuntim, M., & Nobre, P. (2014). The role of cognitive distraction on female orgasm. *Sexologies, 20*, 212–214. doi:10.1016/j.sexol.2011.08.001
- Curtis, Y., Eddy, L., Ashdown, B. K., Feder, H., & Lower, T. (2012). Prelude to a coitus: Sexual initiation cues among heterosexual married couples. *Sexual and Relationship Therapy, 27*, 322–334. doi:10.1080/14681994.2012.734604
- Debrot, A., Schoebi, D., Perrez, M., & Horn, A. B. (2013). Touch as an interpersonal emotion regulation process in couples' daily lives: The mediating role of psychological intimacy. *Personality and Social Psychology Bulletin, 39*, 1373–1385. doi:10.1177/0146167213497592
- Derogatis, L., Clayton, A., Lewis-D'Agostino, D., Wunderlich, G., & Fu, Y. (2008). Validation of the Female Sexual Distress Scale—Revised for assessing distress in women with hypoactive sexual desire disorder. *Journal of Sexual Medicine, 5*, 357–364. doi:10.1111/j.1743-6109.2007.00672.x
- Derogatis, L. R., Pyke, R., McCormack, J., Hunter, A., & Harding, G. (2013). Female Sexual Distress Scale—Revised. In T. D. Fisher, C. M. Davis, W. L. Yarber, & S. L. Davis (Eds.), *Handbook of sexuality-related measures* (pp. 203–204). New York, NY: Routledge.
- Forbes, M. K., Baillie, A. J., & Schniering, C. A. (2014). Critical flaws in the Female Sexual Function Index and the International Index of

- Erectile Function. *Journal of Sex Research*, 51, 485–491. doi:10.1080/00224499.2013.876607
- Frigon, J.-Y., & Laurencelle, L. (1993). Analysis of covariance: A proposed algorithm. *Educational and Psychological Measurement*, 53, 1–18. doi:10.1177/0013164493053001001
- 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. doi:10.1037/0893-3200.21.4.572
- Gallace, A., & Spence, C. (2010). The science of interpersonal touch: An overview. *Neuroscience and Biobehavioral Reviews*, 34, 246–259. doi:10.1016/j.neubiorev.2008.10.004
- Graber, E. C., Laurenceau, J.-P., Miga, E., Chango, J., & Coan, J. (2011). Conflict and love: Predicting newlywed marital outcomes from two interaction contexts. *Journal of Family Psychology*, 25, 541–550. doi:10.1037/a0024507
- Graziottin, A., Serafini, A., & Palacios, S. (2009). Aetiology, diagnostic algorithms, and prognosis of female sexual dysfunction. *Maturitas*, 63, 128–134. doi:10.1016/j.maturitas.2009.04.007
- Gulledge, A. K., Gulledge, M. H., & Stahmann, R. F. (2003). Romantic physical affection types and relationship satisfaction. *American Journal of Family Therapy*, 31, 233–242. doi:10.1080/01926180390201936
- Hanzal, A., Segrin, C., & Dorros, S. M. (2008). The role of marital status and age on men's and women's reactions to touch from a relational partner. *Journal of Nonverbal Behavior*, 32, 21–35. doi:10.1007/s10919-007-0039-1
- Hertenstein, M. J. (2006). The communicative functions of touch in humans, nonhuman primates, and rats. *Genetic, Social, and General Psychology Monographs*, 132, 5–94. doi:10.3200/MONO.132.1.5-94
- Hesterberg, T., Moore, D. S., Monaghan, S., Clipson, A., & Epstein, R. (2005). Bootstrap methods and permutation tests. In *Companion chapter to the practice of business statistics* (pp. 18–4–18–7). New York, NY: W. H. Freeman.
- Hinchliff, S., Gott, M., & Wylie, K. (2012). A qualitative study of heterosexual women's attempts to renegotiate sexual relationships in the context of severe sexual problems. *Archives of Sexual Behavior*, 41, 1253–1261. doi:10.1007/s10508-012-9903-0
- Hineline, P. N. (1977). Negative reinforcement and avoidance. In W. K. Honig & J. E. R. Staddon (Eds.), *Handbook of operant behavior* (pp. 364–414). Englewood Cliffs, NJ: Prentice-Hall.
- Hughes, R., & Huby, M. (2004). The construction and interpretation of vignettes in social research. *Social Work and Social Sciences Review*, 11, 36–51. doi:10.1921/17466105.11.1.36
- Janssen, E., Everaerd, W., Spiering, M., & Janssen, J. (2000). Automatic processes and the appraisal of sexual stimuli: Toward an information processing model of sexual arousal. *Journal of Sex Research*, 37, 8–23. doi:10.1080/00224490009552016
- Jones, S. E., & Yarbrough, E. (1985). A naturalistic study of the meanings of touch. *Communication Monographs*, 52, 19–56. doi:10.1080/03637758509376094
- Laan, E., Van Driel, E. M., & Van Lunsen, R. H. W. (2008). Genital responsiveness in healthy women with and without sexual arousal disorder. *Journal of Sexual Medicine*, 5, 1424–1435. doi:10.1111/j.1743-6109.2008.00827.x
- Linschoten, M., Weiner, L., & Avery-Clark, C. (2016). Sensate focus: A critical literature review. *Sexual and Relationship Therapy*, 31, 230–247. doi:10.1080/14681994.2015.1127909
- Lykins, A. D., Meana, M., & Minimi, J. (2011). Visual attention to erotic images in women reporting pain with intercourse. *Journal of Sex Research*, 48, 43–52. doi:10.1080/00224490903556374
- Marriott, C., & Thompson, A. R. (2008). Managing threats to femininity: Personal and interpersonal experience of living with vulval pain. *Psychology and Health*, 23, 243–258. doi:10.1080/14768320601168185
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, 44, 1–23. doi:10.3758/s13428-011-0124-6
- McCabe, M. P. (2005). The role of performance anxiety in the development and maintenance of sexual dysfunction in men and women. *International Journal of Stress Management*, 12, 379–388. doi:10.1037/1072-5245.12.4.379
- Mercer, C. H., Fenton, K. A., Johnson, A. M., Wellings, K., Macdowall, W., McManus, S., ... Erens, B. (2003). Sexual function problems and help-seeking behaviour in Britain: National probability sample survey. *BMJ*, 327, 426–427. doi:10.1136/bmj.327.7412.426
- Metz, M. E., & Epstein, N. (2002). Assessing the role of relationship conflict in sexual dysfunction. *Journal of Sex and Marital Therapy*, 28, 139–164. doi:10.1080/00926230252851889
- Meyer-Bahlburg, H. F. L., & Dolezal, C. (2007). The Female Sexual Function Index: A methodological critique and suggestions for improvement. *Journal of Sex and Marital Therapy*, 33, 217–224. doi:10.1080/00926230701267852
- Mitchell, K. R., Mercer, C. H., Ploubidis, G. B., Jones, K. G., Datta, J., Field, N., ... Clifton, S. (2013). Sexual function in Britain: Findings from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *The Lancet*, 382, 1817–1829. doi:10.1016/S0140-6736(13)62366-1
- Nappi, R. E., Kingsberg, S., Maamari, R., & Simon, J. (2013). The CLOSER (Clarifying Vaginal Atrophy's Impact on Sex and Relationships) Survey: Implications of vaginal discomfort in postmenopausal women and in male partners. *Journal of Sexual Medicine*, 10, 2232–2241. doi:10.1111/jsm.12235
- Nappi, R. E., Terreno, E., Tassorelli, C., Sances, G., Allena, M., Guaschino, E., ... Polatti, F. (2012). Sexual function and distress in women treated for primary headaches in a tertiary university center. *Journal of Sexual Medicine*, 9, 761–769. doi:10.1111/j.1743-6109.2011.02601.x
- 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
- Nguyen, T., Heslin, R., & Nguyen, M. L. (1975). The meanings of touch: Sex differences. *Journal of Communication*, 25, 92–103. doi:10.1111/j.1460-2466.1975.tb00610.x
- Osgarby, S. M., & Halford, W. K. (2013). Couple relationship distress and observed expression of intimacy during reminiscence about positive relationship events. *Behavior Therapy*, 44, 686–700. doi:10.1016/j.beth.2013.05.003
- Purdon, C., & Watson, C. (2011). Non-erotic thoughts and sexual functioning. *Archives of Sexual Behavior*, 40, 891–902. doi:10.1007/s10508-011-9755-z
- Rancourt, K. M., & Rosen, N. O. (2016). Psychometric data (Unpublished raw data). Retrieved from <http://natalieorosen.com/wp-content/uploads/2016/07/Results-of-Touch-Pilot-Study.pdf>
- Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., ... D'Agostino, R. (2000). The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex and Marital Therapy*, 26, 191–208. doi:10.1080/009262300278597
- Shacham, S. (1983). A shortened version of the Profile of Mood States. *Journal of Personality Assessment*, 47, 305–306. doi:10.1207/s15327752jpa4703_14
- Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology*, 4, 1–32. doi:10.1146/annurev.clinpsy.3.022806.091415
- Shifren, J. L., Monz, B. U., Russo, P. A., Segreti, A., & Johannes, C. B. (2008). Sexual problems and distress in United States women: Prevalence and correlates. *Obstetrics and Gynecology*, 112, 970–978. doi:10.1097/AOG.0b013e3181898c8b
- Smith, L., Heaven, P. C. L., & Ciarrochi, J. (2008). Trait emotional intelligence, conflict communication patterns, and relationship satisfaction. *Personality and Individual Differences*, 44, 1314–1325. doi:10.1016/j.paid.2007.11.024
- Stephenson, K. R., & Meston, C. M. (2012). Consequences of impaired female sexual functioning: Individual differences and associations with sexual distress. *Sexual and Relationship Therapy*, 27, 344–357. doi:10.1080/14681994.2012.738905
- Van Anders, S. M., Edelman, R. S., Wade, R. M., & Samples-Steele, C. R. (2012). Descriptive experiences and sexual vs. nurturant aspects of

- cuddling between adult romantic partners. *Archives of Sexual Behavior*, 42, 553–560. doi:10.1007/s10508-012-0014-8
- Van Den Hout, M., & Barlow, D. (2000). Attention, arousal, and expectancies in anxiety and sexual disorders. *Journal of Affective Disorders*, 61, 241–256. doi:10.1016/S0165-0327(00)00341-4
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070. doi:10.1037/0022-3514.54.6.1063
- Wiegel, M., Meston, C., & Rosen, R. (2005). The Female Sexual Function Index (FSFI): Cross-validation and development of clinical cutoff scores. *Journal of Sex and Marital Therapy*, 31, 1–20. doi:10.1080/00926230590475206
- Wiegel, M., Scepkowski, L. A., & Barlow, D. H. (2007). Cognitive-affective processes in sexual arousal and sexual dysfunction. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 143–165). Bloomington: Indiana University Press.