

Heterosexual Women's Causal Attributions Regarding Impairment in Sexual Function: Factor Structure and Associations with Well-Being

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Abstract Theory and interventions for female sexual dysfunction typically emphasize the role of cognitions, including the perceived causes of impaired sexual function (causal attributions). Although causal attributions have been extensively studied in the context of mood disorders and relational distress, research in the area of sexual dysfunction has been limited. The current study explored the factor structure of women's causal attributions regarding their impaired sexual function and the association between these attributions and multiple indicators of subjective well-being. Women in heterosexual relationships reporting current impairments in sexual function ($N = 147$) completed self-report scales assessing 13 distinct causal attributions, sexual function, and subjective well-being. Results suggested moderately reliable patterns of attributions regarding responsibility (e.g., self vs. partner), specificity to sexual activity, and the degree to which women could effectively address the causes of their difficulties. Beliefs that impaired sexual function was the fault of one's self or one's partner, caused by wider issues in the relationship, and difficult to effectively address were generally associated with lower well-being over and above severity of functional impairment. These findings support multiple theories of sexual dysfunction, and highlight the potential importance of cognitive factors in understanding and treating female sexual dysfunction.

Keywords Female sexual dysfunction · Causal attributions · Subjective well-being · Sexual satisfaction · Relational satisfaction

Introduction

Impaired female sexual function (problems with sexual desire, arousal, orgasm, and sexual pain) (Rosen et al., 2000) is very common in the United States, with 12-month prevalence rates ranging from 32 to 85 % (Hayes et al., 2008). A significant portion of these impairments cause high levels of personal or interpersonal distress (Bancroft, Loftus, & Long, 2003), meeting criteria for sexual dysfunction (APA, 2013). Sexual dysfunction is strongly associated with mental health, relational satisfaction, and overall quality of life (Atlantis & Sullivan, 2012; Karney & Bradbury, 1995; Stephenson & Meston, 2015a). Given the scope and importance of sexual dysfunction, numerous treatments have been developed (O'Donohue, Dopke, & Swingen, 1997). One of the most commonly used interventions is cognitive behavioral therapy (CBT).

CBT for sexual dysfunction attempts to alter patterns of thinking and behavior that impair sexual function and give rise to distress through a variety of specific interventions such as psychoeducation (Brotto et al., 2008), directed masturbation (Andersen, 1981), and couples-based sensate focus (Regev & Schmidt, 2008). Essentially all modern forms of CBT also address the individual's subjective interpretations of her sexual problems, generally referred to as "cognitions." This focus on cognitions stems from Beck's (1987) classic cognitive model and Barlow's (1986) model of sexual dysfunction. The cognitive model suggests that interpretations of stressful events, rather than the events themselves, are the direct causes of emotional responses and subsequent attempts to cope. CBT generally attempts to identify possible distortions in patients' interpretation of events that lead to inappropriately high levels of negative affect and ineffective coping. CBT uses interventions such as Socratic questioning to help patients challenge these distorted and unhelpful patterns of thinking (Beck, 1995) and replace them with more accurate and adaptive cognitions.

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Barlow's (1986) model suggests that cognitions play an important etiological and maintenance role in female sexual function in particular. Barlow's dysfunctional cycle of attentional biases, increased autonomic arousal, and impaired arousal is thought to be initiated by high levels of negative affect (Wiegel, Scepkowski, & Barlow, 2005). This initial negative affect is not a direct result of the sexual situation (activating event) but, rather, the individual's expectancies and interpretations regarding the situation (cognitions). Additionally, the individual's interpretation of her increased autonomic arousal during sexual activity is thought to determine whether these physiological changes facilitate or impede genital arousal. Given the importance of these interpretations, CBT for sexual dysfunction attempts to identify and alter dysfunctional cognitions surrounding sexual activity.

Although CBT has been shown to be highly efficacious in treating a wide range of mental health conditions (for an overview, see Butler et al., 2006), the limited research on CBT for female sexual dysfunction is mixed (Heiman, 2002). Many studies are plagued by methodological problems, and even the best randomized trials find incomplete improvement in symptoms and a significant proportion of participants who do not respond to treatment (e.g., McCabe, 2001; Trudel et al., 2001). One potential reason for these modest effects is a limited understanding of the specific cognitive factors that cause and maintain sexual dysfunction in women (ter Kuile, Both, & van Lankveld, 2010). In other words, what specific cognitions are most common and most disruptive to sexual function and well-being? One type of cognition that may play a key role in sexual dysfunction is one's belief regarding the causes of the sexual impairment.

Causal attributions (alternatively known as etiological attributions) represent individuals' efforts to explain the causes of their experiences in an attempt to maintain a coherent view of themselves and the world (Jodoin et al., 2011; Shiloh, Rashuk-Rosenthal, & Yael, 2002). In most cases, many different potential causes for the same problem can be identified. For example, a woman with difficulties reaching orgasm could attribute this problem to her discomfort with her body, the fact that she has been working too much, or her partner's limited sexual repertoire. Importantly, the same initial problem (not reaching orgasm) may have notably different emotional and behavioral consequences (mild frustration vs. intense shame) depending on the individual's explanation regarding the causes of the impairment.

Causal attributions have been a target of research in multiple fields, including depression and relationship distress. Depression researchers have long recognized a "depressive triad" of locus, globality, and stability that tends to minimize the emotional impact of positive events and maximize the impact of negative events. For depressed individuals, positive events tend to be attributed to external, specific, and unstable factors while negative events are attributed to internal, global, and stable factors (e.g., Abramson, Metalsky, & Alloy, 1989). This explanatory style has been shown to be a risk factor for future depressive episodes (Alloy et al., 2006; Lau &

Eley, 2008) and a potent maintaining factor of current depression (e.g., Cole & Turner, 1993).

Causal attributions also seem to be a key factor in explaining relational conflict and distress. Similar to depression, attributing relational conflict to stable, global, and internal factors is associated with increased relational distress (Bradbury & Fincham, 1990, 1992). However, relationship researchers have expanded the range of causal attributions to account for the more complicated interpersonal nature of conflict between partners. In particular, attributions regarding controllability (Can I or my partner control the cause of conflict?), responsibility (Am I or my partner responsible for the cause?), intent (Was my partner's intent positive or negative?), and blame (Does my partner or I deserve to be blamed for the conflict?) have been shown to be distinct from the basic attributional triad of locus, globality, and stability, and distinguishable from one another (Bradbury & Fincham, 1990). Fincham and Bradbury (1992) developed and validated the Relationship Attributions Measure (RAM), a brief self-report scale that assesses this range of attributions. Scores on this scale, which reflect a multi-faceted pattern of beliefs regarding the causes of relational conflict, have been shown to predict a range of important outcomes, including relational satisfaction (Miller & Bradbury, 1995) and behavior during conflict (Durtshi, Fincham, Cui, Lorenz, & Conger, 2011).

In contrast to the fairly extensive research on attributions in these areas, there is limited research on the role of causal attributions in sexual dysfunction (Jodoin et al., 2011). Causal attributions may be of particular importance for female sexual dysfunction because of the complex (and often undeterminable) biopsychosocial etiology of these disorders (e.g., Brotto & Luria, 2014). Given that one specific cause can rarely be pinpointed, subjective beliefs about the causes may have a large effect on both sexual well-being and choice of treatment (Meana, Binik, Khalife, & Cohen, 1999; Mitchell, King, Nazareth, & Wellings, 2011).

Studies have shown that men with sexual dysfunction are more likely to make internal and stable attributions regarding their sexual impairment, while men without sexual dysfunction are more likely to identify external factors to explain difficulties with sexual functioning (Scepkowski et al., 2004). Additionally, experimentally inducing an internal, stable attributional style towards erectile difficulties can result in poorer subsequent erectile response (Weisberg, Brown, Wincze, & Barlow, 2001). Other early research assessed causal attributions for sexual dysfunction in both men and women. Loose, Bridges, and Critelli (1987) found that women with orgasm problems were more likely to identify stable causes of not reaching orgasm. Fichten, Spector, and Libman (1988) built on these findings, showing that individuals with sexual problems were more likely to attribute their problems to internal factors (rather than their partners or outside circumstances), and that attributing sexual problems to uncontrollable causes was correlated with higher levels of subjective distress. Simkins-Bullock (1992) also found that individuals with sexual difficulties were most likely to attribute the

problem to the individual. However, this study was one of the first to note that sexual problems were often attributed to both the individual and the partner simultaneously.

In the last 15 years, almost all research on causal attributions regarding female sexual dysfunction has focused on women with the sexual pain disorders: vaginismus and dyspareunia (APA, 2000). Meana et al. (1999) assessed women diagnosed with dyspareunia and found that those who identified physiological (vs. psychological) causes of their pain reported significantly less pain, higher marital satisfaction, and better mental health. Unfortunately, participants in this study were not able to select *both* physiological and psychological causes of their pain. This limitation was highlighted by Ward and Ogden (2010), who found that many women with vaginismus identified multiple simultaneous causes of their sexual problems. These results mirror several smaller qualitative studies (e.g., Sims & Meana, 2010) and are consistent with current theory regarding sexual dysfunction (and psychological disorders in general) as determined by a mixture of biological, psychological, and social factors.

Jodoin et al. (2011) conducted one of the most comprehensive analyses regarding the correlates of causal attributions regarding sexual pain. In a departure from most previous studies, they adapted a validated scale of causal attributions (the Extended Attributional Style Questionnaire, Metalsky, Halberstadt, & Abramson, 1987) to measure attributions regarding vaginal pain. Importantly, women were able to select multiple types of attributions simultaneously and thus more accurately represent multi-faceted attributional styles. They found that attributing pain to global and stable causes was associated with higher levels of psychological distress, and that attributing pain to more internal and less global causes was associated with higher relational adjustment. In general, attributions explained between 5 and 20 % of the variance in these psychosocial outcomes.

These studies suggest that women exhibit complex attributional patterns, often identifying multiple simultaneous causes of their sexual difficulties, and that these patterns are correlated with levels of sexual function, subjective distress, and relational adjustment. However, research to date has been limited in a number of important ways. First, a majority of studies have dichotomized attributions (e.g., Is your pain caused by physiological *or* psychological factors?) and analyzed only one type of attribution at a time (e.g., a bivariate correlation between stability attributions and well-being) despite evidence in sexuality research and the wider literature that *patterns* of attributions are more predictive of emotions and behaviors (e.g., Bradbury & Fincham, 1992).

Second, almost all recent quantitative research has focused on sexual pain disorders despite the fact that other sexual difficulties, such as impaired desire and arousal, are more common (Hayes et al., 2006), and may be qualitatively distinct from pain disorders (Binik et al., 2002). Third, studies in this area have assessed a relatively limited range of attributions. Many have focused on only one or two (e.g., physiological vs. psychological causes), but even the most comprehensive have primarily measured the original triad (locus, globality, and stability). For example, the scale used by

Jodoin et al. (2011) did not include items assessing blame attributions. Indeed, we are aware of no recent quantitative studies that have explicitly assessed attributions regarding control, intent, and blame in the context of sexual dysfunction. Research on romantic relationships suggests that these attributions are important in predicting distress and behavior (Durtschi et al., 2011; Miller & Bradbury, 1995) and smaller qualitative studies (e.g., Mitchell et al., 2011) suggest that these attributions in particular may aid or impede adjustment to sexual difficulties.

To begin to address these limitations, the overall goal of the current study was to assess the association between causal attributions regarding sexual difficulties and subjective sexual well-being. We adapted a validated scale assessing a wide range of attributions regarding relational conflict (the RAM) (Fincham & Bradbury, 1992) to focus specifically on attributions regarding impaired sexual function. We then analyzed this adapted scale in three ways. First, we assessed bivariate correlations between individual items and multiple indicators of subjective well-being, a method most closely approximating past research in this area. We also conducted multiple regression analyses to test all individual items of the scale as predictors of subjective well-being simultaneously. Additionally, we performed exploratory analyses to determine if there was a reliable and interpretable internal factor structure to the scale, then tested factor scores as predictors of subjective well-being.

With the inclusion of factor-analytic methods, we hoped to examine the link between well-being and patterns of attributions, rather than individual items (e.g., assessment of perceived stability of the causes without considering perceptions of responsibility/blame). The original validation study of the RAM (Fincham & Bradbury, 1992) suggested that a 2-factor structure differentiating between cause attributions (i.e., locus, stability, globality) and responsibility attributions (i.e., control, intent, blame) was a better fit to their data than a single-factor structure. However, we are aware of only one follow-up factor-analytic study of the RAM (Kawashima et al., 2008), and there is a lack of research that would allow us to predict whether attributions regarding impaired sexual function should exhibit a similar factor structure.

In addition to testing for internal factor structures, we also expanded on past studies by utilizing a sample of women with a variety of sexual difficulties to assess whether attributions may be important across the range of female sexual dysfunction. Lastly, theoretical models suggest that interpretations of events should have an effect on emotional responses independently of the events themselves (Beck, 1987). Therefore, we tested whether causal attributions regarding impaired sexual function predicted subjective well-being over and above the specific severity of functional impairment.

Our hypotheses were (1) That attributions would be correlated with subjective well-being, such that women identifying internal, global, stable, uncontrollable causes, as well as women seeing themselves or their partner as having negative intent and being worthy of blame, would report lower well-being, and (2) that these associations

between attributions and well-being would remain, after controlling for the severity of impairment in sexual function.

Method

Participants and Procedure

The current analyses utilized a subset of 147 female participants from two previously collected samples. Given our aim of assessing causal attributions regarding female sexual dysfunction, we only included women who fell into the established range for sexual dysfunction on the Female Sexual Function Index (below 26.55, with lower scores indicating greater impairment in sexual function, Weigel, Meston, & Rosen, 2005). Given our interest in attributions regarding one's relational partner, we also only included women who identified themselves as being in a "committed heterosexual relationship" or married.

The larger initial samples were collected for an earlier primary and follow-up study (Stephenson & Meston, 2015b). Sample 1 consisted of 97 women recruited via online advertisements and paper fliers from a large city in the southern United States. Participants in this sample were required to be 18 years or older, currently in a heterosexual monogamous romantic relationship, and self-identified as experiencing problems in one or more of the following areas in the past month: low sexual desire, low sexual arousal, impaired vaginal lubrication, difficulty reaching orgasm, or pain/discomfort during or following sexual activity. Given the goals of the initial study, women were allowed to define the level of impaired sexual function that constituted a "problem," with the final sample exhibiting significant variability in this regard (Stephenson, Toorabally, Lyons, & Meston, in press). Participants were also required to report willingness to attempt partnered sexual activity in the following month (this requirement was related to another aspect of the study not associated with the current analyses). Participants completed a phone screen and were interviewed face-to-face in our laboratory before completing the measures used in the current study. They were compensated monetarily for their time.

Sample 2 consisted of 485 women recruited via online advertisements posted in a variety of major cities throughout the United States. Advertisements were similar to those used for Sample 1, requesting participants who were female, 18 years or older, currently in a heterosexual monogamous romantic relationship, and experiencing one or more impairments in sexual function. Due to practical and funding constraints, these participants did not complete formal screenings or in-person interviews. Instead, interested participants were guided directly to an online survey which they were able to complete anonymously at their convenience. They were not compensated. All participants in both samples received informed consent and study protocol was approved by the University of Texas at Austin Institutional Review Board.

After exclusions, the current analyses utilized 66 women from Sample 1 and 81 women from Sample 2. For included participants

from Sample 1, the average age was 28 years ($SD = 7$). Participants were 80.4 % Caucasian, 13.4 % Hispanic, 7.2 % Asian American, 5.2 % African-American, and 2.1 % other (participants could select multiple ethnicities). The average length of relationship was 55.1 months ($SD = 72.71$ months) and 30.3 % were married. Regarding education level, 3 % had earned a high school diploma, 28.8 % had completed some college, 37.9 % had earned a bachelor's degree, and 30 % had earned a graduate degree. For included participants from Sample 2, the average age was 26.31 years ($SD = 7.6$), and was 68.4 % Caucasian, 16.5 % Hispanic, 8.9 % Asian American, 1.3 % African-American, and 5.1 % other. The average length of relationship reported was 51.65 months ($SD = 59.58$ months) and 34.6 % were married. Regarding education level, 22.2 % had earned a high school diploma or less, 65.4 % had completed some college or had earned a bachelor's degree, and 12.3 % had earned a graduate degree. A MANOVA (for continuous variables) and chi-square test (for categorical variables) suggested no significant differences in demographics between samples. However, educational attainment could not be statistically compared given the slightly differing methods of measurement for this variable across samples. For example, the options of "some college" and "bachelor's degree" were separated in sample 1 and combined in sample 2. A visual inspection suggested that more participants in sample 1 had earned a graduate degree whereas more participants in sample 2 had earned a high school diploma or less.

Measures

Sexual Dysfunction Attributions Scale (SDAS)

Causal attributions regarding impaired sexual function were assessed using the Sexual Dysfunction Attributions Scale (SDAS), which was created for the current study. This scale consisted of 13 Likert items wherein participants rated their level of agreement with statements on a 6 point scale. The items were based on those included in the Relational Attribution Measure (Fincham & Bradbury, 1992) which asks individuals to rate the causes of interpersonal conflict within a romantic relationship along a number of continua including locus, stability, globality, responsibility, intent, and blame. The RAM is well-validated and, at the time of this writing, has been cited over 200 times in the PsycINFO database.

When completing the RAM, relational partners are presented with a number hypothetical situations based on virtually universal conflicts in relationships (e.g., Your partner does not pay attention to what you are saying) provided by a previously validated scale (Weiss & Perry, 1979). However, given the diversity of sexual difficulties and lack of a corresponding scale that includes specific scenarios of sexual dysfunction, we opted instead to provide clear definitions regarding impairments in various aspects of sexual function, and then asked participants to bring their personal experiences of sexual dysfunction to mind when responding to items. We also included additional items to assess the potentially more complex etiology of impaired sexual function (e.g., differentiating between

physiological and psychological aspects of one's self as causes of sexual problems) that are not as relevant for attributions regarding relational conflict. See Appendix 1 for all scale instructions and items.

Female Sexual Function Index (FSFI)

The FSFI is a 19-item measure of female sexual function including 6 domains: desire, arousal, lubrication, orgasm, satisfaction, and pain (Rosen et al., 2000). The FSFI is one of the best validated self-report measures of sexual function (Stephenson et al., in press) and reliably differentiates between women with a variety of sexual dysfunctions (Meston, 2003; Rosen et al., 2000). All domains have been shown to have acceptable internal reliability (Cronbach's $\alpha=0.82-0.92$) 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 (Locke & Wallace, 1959). In the current analyses, a score was computed that excluded the Satisfaction subscale due to its conceptual overlap with our outcomes of interest, and the fact that it has been shown to measure a distinct construct (e.g., Stephenson, Pulverman, & Meston, 2014).

Sexual Satisfaction Scale for Women (SSS-W)

The SSS-W is a 30-item self-report measure of subjective sexual well-being in women. It provides scores in five domains: content-

ment, sexual communication, compatibility, personal concern, and interpersonal concern (Meston & Trapnell, 2005). The SSS-W has been shown to exhibit good internal reliability (Cronbach's $\alpha=.94$) and test-retest reliabilities during a four-week interval (Pearson's $r=0.87$). Convergent and discriminant validity have been established utilizing the FSFI (Rosen et al., 2000) and Locke-Wallace Marital Adjustment Test (1959), respectively, and the scale has been shown to differentiate between women with and without sexual dysfunction (Meston & Trapnell, 2005). In the current analyses, we used the Contentment subscale score as our measure of sexual satisfaction and the Personal Concern score as our measure of sexual distress. Research has suggested that these two factors are distinguishable conceptually and empirically (Stephenson & Meston, 2010).

Couples Satisfaction Index (CSI)

The CSI (Funk & Rogge, 2007) is a 16-item measure of relationship satisfaction (4-item, 16-item, and 32-item forms exist). Internal reliability is excellent (Cronbach's $\alpha=.98$) and convergent/divergent validity has been well-established using previously constructed scales of relationship satisfaction and adjustment. However, the scale's ability to differentiate between distressed and non-distressed couples has been shown to be superior to other similar scales (Funk & Rogge, 2007), leading to widespread adoption of the CSI (e.g., at the time of this writing, it has been cited over 160 times in the PsycINFO database).

Table 1 Pearson's correlations, means, and SDs for study variables

Variable M (SD)	Internal personal 4.2 (1.6)	Internal physical 3.4 (1.9)	Partner cause 2.8 (1.8)	External cause 3.0 (1.7)	Specific to sex 3.2 (1.8)	Global to relationship 3.1 (1.6)	Personal control 2.6 (1.2)
Sexual satisfaction	-.21*	-.15 ⁺	-.18*	-.15 ⁺	-.05	-.52***	.01
Sexual distress	-.28**	-.15 ⁺	-.17*	-.24**	.02	-.46***	-.03
Relational satisfaction	.11	.23**	-.53***	-.12	.09	-.34***	-.02
	Partner control 2.3 (1.3)	Stable causes 4.3 (1.3)	Partner purpose 2.8 (1.7)	Partner positive intent 5.1 (1.2)	Partner blame 1.8 (1.1)	Personal blame 3.0 (1.5)	
Sexual satisfaction	-.12	-.30***	.07	.11	-.07	-.21*	
Sexual distress	-.08	-.26**	-.01	-.01	-.20*	-.17*	
Relational satisfaction	-.24**	.04	-.01	.44***	-.35***	.04	
	Factor 1: Partner's fault 2.2 (1.0)	Factor 2: My fault 3.4 (1.2)	Factor 3: Specific to sex 4.2 (1.2)	Factor 4: Addressable problem 2.7 (1.0)			
Sexual satisfaction	-.17*	-.26**	.02	.21*			
Sexual distress	-.15 ⁺	-.31***	.01	.15 ⁺			
Relational satisfaction	-.53***	.01	.27**	-.03			

Scales of sexual satisfaction, sexual distress, and relational satisfaction are coded such that higher scores indicated higher levels of well-being. Scores for four factors represent averages of individual items included in factor

⁺ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Results

Descriptive Statistics

Descriptive statistics computed for each individual item of the SDAS are shown in Table 1. As can be seen, participants most consistently reported perceiving causes of sexual difficulties that were internal and stable, and that their partners' intent when attempting to influence their sexual function was positive (mean scores >4 out of 6). Participants were least likely to identify aspects of their partners as a cause, to believe that their partners had control over the individual's sexual function, and to blame their partners for the problem (Mean scores <3 out of 6). However, there was still notable variance in these less frequently endorsed items, indicating that a substantial minority of participants did hold these beliefs to some degree.

Principal Components Analysis

To explore the factor structure of the SDAS, we conducted a principal components analysis (PCA) using an oblique direct oblimin rotation. These methods were chosen to account for possible correlations among factors. However, all analyses were conducted using alternative methods (e.g., using factor analysis rather than a PCA, and using varimax rotation), and these changes did not alter the pattern of results. Initially, all attribution items were included in the analysis. However, two items did not load strongly (strongest loadings $<.30$) on any factor: attribution to a specific internal physical cause and the degree to which the partner purposefully attempted to influence the participant's sexual function. Additionally, the item assessing perceived causes as global to the relationship loaded similarly on all factors (factor loadings ranged from .33 to .47). Thus, these three items were removed and the PCA re-run.

Inspection of the scree plot and eigenvalues suggested a 4-factor solution that accounted for 68.3% of the total item variance. Eigenvalues for the four factors were 2.55, 1.69, 1.50, and 1.09. We labeled the first factor, consisting of four items, as "Partner's Fault." Higher scores on this factor indicated a pattern of attributions wherein participant's partners were viewed as a cause of their sexual impairment, partners were seen as having some control over their impact, partners' intent was seen as more negative than positive, and partners were seen as being worthy of blame. The average score across the four items (i.e., sum of the items divided by number of items) was 2.2 ($SD = 1$) with a range of 1–5 and a positively skewed distribution. Cronbach's alpha was .71.

The second factor, consisting of three items, was labeled "My Fault." Higher scores on this factor indicated beliefs that something internal to the participant caused her sexual impairments, that external factors also contributed to the problem, and that she was personally to blame. The average score across the three items was 3.4 ($SD = 1.2$), with a range of 1–6 and a normal distribution. Cronbach's alpha was .56. The third factor, consisting of two

items, was labeled "Specific to Sex." Higher scores on this factor indicated beliefs that the cause(s) of sexual impairment were specific to sexual activity, and that partners' intent was generally positive when attempting to influence participants' sexual function. The average score across the two items was 4.17 ($SD = 1.2$), with a range of 1–6 and a normal distribution. Cronbach's alpha was .35. The fourth factor, consisting of two items, was labeled "Addressable Problem." Higher scores on this factor indicated beliefs that the causes of sexual difficulties were under participants' personal control, and that the cause(s) were not stable. The average score across the items was 2.67 ($SD = 1.0$), with a range of 1–4.5 and a normal distribution. Cronbach's alpha was .37. See Table 2 for a full list of factor loadings.

Bivariate Correlations Between Study Variables

Correlations between attributions and indicators of well-being are also shown in Table 1. As can be seen, there were generally weak-to-moderate associations between attributions and well-being. With the exception of three items (cause specific to sex, personal control over cause, and partners purposefully influencing one's level of sexual function), all attributions were significantly correlated with at least one outcome. Importantly, some individual items were only significantly associated with well-being in the context of meaningful patterns of beliefs (i.e., factors), but not at a bivariate level. For example, seeing functional impairment as under one's control was not predictive of well-being on its own, but was significantly associated with well-being when combined with seeing the cause as unstable.

Regression Analyses

To further test the statistical effect of attributions on well-being, we constructed three multiple linear regression models (one for each indicator of subjective well-being as an outcome variable). In each model, scores for the sexual function subscales of the FSFI (i.e., the FSFI total score without the Satisfaction subscale) were entered on the first step. On the second step, each of the four attribution factors described above were included utilizing mean values of all included items. These models allowed us to assess the unique predictive power of each attribution factor independently of both sexual function and the other attribution factors. They also allowed us to estimate the portion of variance in well-being accounted for by attributions over and above levels of sexual function.

The results of these analyses are shown in Table 3. For example, for the model with sexual satisfaction as the outcome, the overall model was significant, $F(5, 123) = 8.06, p < .001, R^2 = .26$. Taken together, attributions predicted significant unique variance in sexual satisfaction over and above sexual function, $F(4, 118) = 5.45, p < .001, R^2 \text{ change} = .14$. In the final model, the Partner's Fault factor ($\beta = -.27, p < .01$) and the Addressable Problem factor ($\beta = .23, p < .001$) were significant predictors of sexual satis-

Table 2 Factor loadings from principal components analysis

Factor item	Factor 1: Partner's fault	Factor 2: My fault	Factor 3: Specific to sex	Factor 4: Addressable problem
Partner's fault				
Partner cause	.73			
Partner control	.86			
Partner positive intent	-.41		.70	
Partner blame	.84			
My fault				
Internal personal cause		.79		
External causes		.63		
Personal blame		.70		
Specific to sex				
Specific to sex			.75	
Addressable				
Personal control				.73
Stable				-.76

Factor loadings <.30 have been removed

faction controlling for all other predictors in the model. The My Fault factor was also a marginally significant predictor ($\beta = -.15$, $p = .08$). Viewing impaired sexual function as the fault of the individual or her partner was associated with lower sexual satisfaction whereas viewing the impairment as an addressable problem was associated with higher sexual satisfaction (again, independently of the actual level of sexual function). In general, viewing the impairment as one's fault or the fault of the partner was associated with lower well-being whereas viewing the impairment as a specifically sexual and addressable problem was associated with higher well-being in some cases. Attributions accounted for between 14 and 33 % of variance in well-being, over and above sexual function.

Given the relatively low internal reliability of our factors, we also conducted similar regression analyses with one primary change: replacing the four factor scores with the 13 individual item scores on Step 2. The results of these analyses are shown in Table 4. As can be seen, viewing one's sexual dysfunction as indicative of more global problems in the relationship was the strongest and most consistent predictor of poorer well-being, followed by perception of stable causes. Perception of oneself as the cause and seeing the partner's intent as positive were associated with higher relational satisfaction in particular. In these analyses, attributions accounted for between 30 and 45 % of variance in well-being, over and above sexual function.

Discussion

The overall aims of the current study were to assess patterns of causal attributions women made regarding impairments in their sexual function, and to test the association between these attributions and subjective well-being. Within the current sample, women were more likely to see aspects of themselves (e.g., their personality

or a medical problem) as the cause of their difficulties as opposed to their partners or outside circumstances. Additionally, participants were most likely to see the causes of their sexual problems as stable, and to see their partners as having positive intentions when attempting to affect their sexual function. However, consistent with previous research (e.g., Simkins-Bullock et al., 1992; Ward & Ogden, 2010), there was a significant amount of variability on all of these continua, suggesting important individual differences in how women interpreted the causes of sexual dysfunction.

A principal components analysis suggested moderately reliable patterns of attributional beliefs. The first two factors that emerged primarily focused on responsibility and blame, with fault falling mainly on the partner or on the individual herself. A third factor suggested the belief that the impaired sexual function was due to specifically sexual factors (e.g., not a poor relationship overall), and that one's partner was generally attempting to be helpful. A fourth factor implied the belief that the causes of the sexual problem were temporary and under one's control; in other words, that the problem could be effectively addressed.

These patterns highlight the importance of adopting a multifaceted conceptualization of attributional beliefs. For example, believing that one's partner has some control over one's sexual function will likely have a very different impact on well-being depending on whether the partner's intent is seen as positive or negative. Thus, both beliefs need to be considered together to effectively measure their potential consequences. The current results also speak to the importance of attributions regarding control, intent, and blame. These beliefs have long been measured in the marital satisfaction literature (Bradbury & Fincham, 1990), but have rarely been studied in the context of female sexual dysfunction (Jodoin et al., 2011). It may be impossible to fully understand the role of classic categories of beliefs (e.g., locus) without taking into account these additional types of attributions.

Table 3 Hierarchical multiple regression models with sexual function and causal attributions as predictors of subjective well-being

Outcome predictor	β	<i>B</i>	<i>SE</i>	<i>F</i>	<i>R</i> ²
Outcome: Sexual satisfaction					.26
Step 1				16.17***	.12
Sexual function	.33	.39	.09***		
Step 2				5.45***	.14
Factor 1: Partner's fault	-.27	-1.2	.38**		
Factor 2: My fault	-.15	-.53	.30 ⁺		
Factor 3: Specific to sex	-.01	-.04	.32		
Factor 4: Addressable problem	.23	1.1	.39**		
Outcome: Sexual distress					.16
Step 1				2.99 ⁺	.02
Sexual function	.12	.18	.13		
Step 2				4.87**	.14
Factor 1: Partner's fault	-.17	-.95	.52 ⁺		
Factor 2: My fault	-.29	-1.4	.42**		
Factor 3: Specific to sex	-.05	-.26	.44		
Factor 4: Addressable problem	.14	.87	.53		
Outcome: Relationship satisfaction					.33
Step 1				0.1	.01
Sexual function	.01	.01	.40		
Step 2				14.50***	.33
Factor 1: Partner's fault	-.55	-9.1	1.3***		
Factor 2: My fault	.13	1.8	1.1 ⁺		
Factor 3: Specific to sex	.15	2.2	1.1 ⁺		
Factor 4: Addressable problem	.09	1.5	1.4		

⁺ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

The current analyses also provide the strongest evidence of which we are aware that causal attributions regarding female sexual function are associated with sexual and relational well-being across the range of functional impairments. Seeing one's self or one's partner as responsible and at fault for the sexual problem was generally associated with lower well-being, whereas seeing the problem as specifically sexual and addressable was sometimes associated with higher well-being. In an additional set of analyses, viewing sexual dysfunction as indicative of more global problems in the relationship stood out as the strongest and most consistent predictor of poor well-being.

Importantly, these associations were maintained while statistically controlling for actual severity of functional impairment. This finding supports the general cognitive model (Beck, 1987) which states that one's interpretation of events, rather than the events themselves, shapes emotional responses. These findings were also consistent with Barlow's model of sexual dysfunction (Wiegel et al., 2005). This model suggests that women with sexual dysfunction exhibit a "sexually dysfunctional mentality" that includes maladaptive causal attributions. The current results suggest that sexual satisfaction and distress, core symptoms of sexual dysfunction (APA, 2013), are indeed associated with specific attributional patterns. Furthermore, high levels of well-being seem to

be predicted not only by the absence of maladaptive attributional patterns, but also by the presence of adaptive patterns (e.g., seeing the causes of impairment as addressable). It seems probable that differences in causal attributions may function as both risk and protective factors for sexual dysfunction.

It is also important to note that the same patterns of beliefs were differentially predictive of either high or low well-being, depending on the specific construct being measured. For example, perceiving the cause of one's sexual problems as internal to the individual was associated with more personal distress, but also higher levels of relational satisfaction, a finding in line with past research (Jodoin et al., 2011). Clearly, it is important for future researchers to specifically define their outcomes, and to acknowledge that the same interpretation can have both positive and negative effects.

Although promising, it is important to note that the effect sizes reported here were moderate. Attributions accounted for between 14 and 45 % of variance in subjective well-being over and above sexual function. These effects were in line with past results based on women with sexual pain disorders (Jodoin et al., 2011). One likely reason for these moderate effects is that additional types of attributions may also play a central role in shaping affective

Table 4 Hierarchical multiple regression models with sexual function and causal attributions as predictors of subjective well-being

Outcome predictor	β	<i>B</i>	<i>SE</i>	<i>F</i>	<i>R</i> ²
Outcome: Sexual satisfaction					.42
Step 1				16.80***	.12
Sexual function	.30	.35	1.0***		
Step 2				4.25***	.30
Personal internal	−.02	−.07	.24		
Personal physical	−.03	−.08	.20		
Partner cause	−.08	−.22	.26		
External cause	.03	.07	.23		
Specific to sex	.04	.11	.22		
Global to relationship	−.40	−1.1	.24***		
Personal control	.04	.14	.33		
Partner control	−.19	−.65	.35 ⁺		
Stability	−.18	−.62	.29*		
Partner purpose	.16	.42	.21 ⁺		
Partner positive intent	−.01	−.04	.33		
Partner blame	.09	.40	.43		
Personal blame	−.08	−.24	.24		
Outcome: Sexual distress					.34
Step 1				3.20 ⁺	.03
Sexual function	.05	.07	.14 ⁺		
Step 2				3.82***	.31
Personal internal	−.14	−.50	.34		
Personal physical	−.09	−.28	.27		
Partner cause	.05	.17	.35		
External cause	−.13	−.41	.32		
Specific to sex	.08	.26	.31		
Global to relationship	−.37	−1.4	.33***		
Personal control	−.01	−.02	.46		
Partner control	−.08	−.35	.49		
Stability	−.17	−.77	.41 ⁺		
Partner purpose	.06	.21	.29		
Partner positive intent	−.17	−.84	.46 ⁺		
Partner blame	−.13	−.71	.59		
Personal blame	.01	.02	.33		
Outcome: Relationship satisfaction					.45
Step 1				0.1	.01
Sexual function	.16	.68	.34 ⁺		
Step 2				6.6***	.45
Personal internal	.19	1.9	.88*		
Personal physical	.13	1.1	.72		
Partner cause	−.43	−4.1	.93***		
External cause	.01	.13	.84		
Specific to sex	−.01	−.06	.80		
Global to relationship	−.15	−1.5	.87 ⁺		
Personal control	.09	1.4	1.2		
Partner control	.07	1.0	1.3		
Stability	.06	.74	1.1		
Partner purpose	.12	1.2	.77		

Table 4 continued

Outcome predictor	β	<i>B</i>	<i>SE</i>	<i>F</i>	<i>R</i> ²
Partner positive intent	.21	3.1	1.3*		
Partner blame	-.17	-2.7	1.5 ⁺		
Personal blame	.03	.30	.86		

⁺ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

responses regarding sexual dysfunction. For example, Abramson et al. (1989) suggested that attributions regarding causes, attributions regarding consequences, and attributions regarding the self all work in conjunction to cause and maintain depressive symptoms. Similarly, a range of attributions is likely necessary to account for the emotional impact of sexual dysfunction. For example, Nobre and Pinto-Gouveia (2009) constructed a scale measuring the degree to which sexual difficulties activate negative self-schemas and core beliefs. A study assessing the unique and combined impact of these cognitions and causal attributions may hold great promise in providing a better sense of the importance of cognitive factors in female sexual dysfunction.

Future directions for research in this area also include measuring causal attributions in the context of treatment for sexual dysfunction. Theoretically, these beliefs should serve as maintaining factors of sexual distress, should respond to cognitive interventions, and should mediate the effectiveness of these cognitive therapies. However, there is a general paucity of research regarding the mechanisms through which psychotherapeutic interventions ameliorate sexual dysfunction (e.g., Stephenson & Meston, 2015b). Guidelines for investigating these questions are available (Kazdin, 2007), and well-controlled intervention studies are needed.

The current study had a number of strengths, including utilizing a sample of women with significant sexual difficulties, using validated measures (or scales based on validated measures), and utilizing multivariate statistical models. However, there were a number of important limitations. First, the sample size of 147 was relatively small for a study utilizing factor analysis. This sample size, along with the small number of items within identified scales, likely contributed heavily to low internal reliability of factors. Although we attempted to assure the robustness of our findings by including analyses utilizing individual items, single-item measures are known to reduce reliability (e.g., Lucas & Brent Donnellan, 2012). It will be important for future studies to replicate the factor structure identified in the current study, ideally utilizing a priori predictions and confirmatory factor analysis. Additional aspects of the sample also limit the generalizability of the findings. Participants were generally young, well-educated, and in sexually active relationships. Additionally, there appeared to be differences in educational attainment between our two samples that could not be formally analyzed due to inconsistencies in measurement. Age, education, and relational status have all been shown to be associated with sexual function and/or well-being (e.g., Laumann, Palik, & Rosen, 1999; Meyer-Bahlburg & Dolezal,

2007; Stephenson & Meston, 2012) and future work that includes purposeful sampling of more diverse populations is needed to determine the degree to which our results apply more broadly.

Furthermore, it is important to acknowledge the difficulty in effectively measuring cognitive factors such as causal attributions. Asking individuals to rate their beliefs regarding causes of specific problems on a number of relatively abstract continua is potentially confusing. Although we attempted to clearly define all relevant concepts, further validation work is needed on the Sexual Dysfunction Attribution Scale. In particular, participants in the current study were asked to bring to mind a specific group of impairments in sexual function when providing responses. However, it is impossible to rule out the possibility that other “sexual problems” such as difficulty communicating with one’s partner or decreased physical pleasure were also considered. An alternative method of assessment, and one used in the initial Relationship Attribution Measure (Fincham & Bradbury, 1992), is to provide specific vignettes for participants to imagine when responding to items. While this method would have been difficult in the current study given that women presented with a variety of distinct sexual complaints, it is certainly worth evaluating in future research as a possible way to decrease measurement error.

Lastly, the inclusion of women with a variety of sexual difficulties was both a strength and a weakness of the current study. On the one hand, there may be important differences between, say, a woman with anorgasmia and one with low sexual desire in terms of their attributions. Given the relatively small number of women with each specific category of impairment, and the high degree of comorbidity between these problems, it was not possible to make direct comparisons in the current study. However, this aspect of the sample mirrors the high comorbidity between sexual dysfunction diagnoses in the general population (e.g., Nobre, Pinto-Gouveia, & Gomes, 2006). Indeed, a sample of women with *only* one type of sexual impairment would be fairly unrepresentative of both the population and clinical samples, limiting the external validity of any findings. However, it would certainly be helpful for future research to include larger samples and/or engage in targeted recruitment of specific diagnoses to make such comparisons possible.

Despite these limitations, the current study adds to a growing body of literature suggesting that a range of causal attributions regarding female sexual dysfunction are related to sexual and relational well-being. Furthermore, these are the first results of which we are aware that suggest this relationship between cognitions

and emotional response may be independent of levels of sexual function per se. These findings support current theoretical models of sexual dysfunction, and are consistent with CBT's focus on one's interpretation of sexual difficulties as a key target of treatment. Additional work is needed to establish a possible causal relationship between attributions and emotional responses, and to further elucidate the importance of attributions in the treatment of female sexual dysfunction.

Appendix: The Sexual Dysfunction Attributions Scale

For the following scale, we are defining sexual difficulties as problems you have experienced with sexual functioning. Sexual functioning has four primary areas:

Sexual desire: a feeling that includes wanting to have a sexual experience, feeling receptive to a partner's sexual initiation, and thinking or fantasizing about sex.

Sample difficulty: feeling low or no desire to engage in sexual activity

Sexual arousal: a feeling that includes both physical and mental aspects of sexual excitement. It may include feelings or warmth or tingling in the genitals, or vaginal lubrication. It may also include feeling "into it" or "turned on" during sexual activity.

Sample difficulty: a lack of genital lubrication, or, not feeling turned on during sex.

Orgasm: the frequency and ease with which you experience climax or orgasm during sexual activity

Sample difficulty: lack of orgasm, or taking too long to climax

Sexual pain: pain or discomfort during sexual activity.

Sample difficulty: a sharp pain felt during vaginal penetration.

While many women are bothered by issues not included in the list above, we would like you to focus on difficulties in these four areas when answering the following questions.

Sexual difficulties can be caused by many factors related to the individual, the relationship, external concerns (work, children, etc.), or the wider culture. While it is usually difficult to identify one specific cause of a sexual difficulty, most people have an opinion as to what causes their sexual difficulties. Please answer the questions below regarding what you see as causing your sexual difficulties. These responses will be based on your opinion only; there are no right or wrong answers.

Anchor points are specified below each item.

1. Something about me physically causes my sexual difficulties (e.g., my own physical/medical issues).

1 – Strongly disagree

6 – Strongly agree

2. Something about me personally causes my sexual difficulties (e.g., the type of person I am, the mood I am in).

1 – Strongly disagree

6 – Strongly agree

3. Something about my partner causes my sexual difficulties (e.g., the type of person he/she is, the mood he/she is in, his/her physical/medical issues).

1 – Strongly disagree

6 – Strongly agree

4. Outside circumstances cause my sexual difficulties (e.g., lack of privacy, social pressures).

1 – Strongly disagree

6 – Strongly agree

5. The cause of my sexual difficulties is specific to sexual activity.

1 – Strongly disagree

6 – Strongly agree

6. The cause of my sexual difficulties affects many areas of my relationship.

1 – Strongly disagree

6 – Strongly agree

7. How stable are the causes of your sexual difficulties?

1 – Causes will never again be present

6 – Causes will always be present

8. To what extent do you have control over the causes of your sexual difficulties?

1 – I have no control

6 – I have complete control

9. To what extent does your partner have control over the causes of your sexual difficulties?

1 – He/she has no control

6 – He/she has complete control

10. To what extent does your partner purposefully affect your sexual functioning?

1 – Not at all

6 – Very much

11. Is your partner's intent generally positive (he/she trying to help) or negative (he/she trying to be detrimental)?

1 – Negative

6 – Positive

12. Does your partner deserve to be blamed for your sexual difficulties?

1 – Deserves no blame

6 – Deserves all blame

13. Do you deserve to be blamed for your sexual difficulties?

1 – Deserve no blame

6 – Deserve all blame

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