

## Do Romantic Partners' Responses to Entry Dyspareunia Affect Women's Experience of Pain? The Roles of Catastrophizing and Self-Efficacy

Ashley J. Lemieux, MA,\* Sophie Bergeron, PhD,<sup>†</sup> Marc Steben, MD,<sup>‡</sup> and Bernard Lambert, MD<sup>§</sup>

\*Department of Sexology, Université du Québec à Montréal, Montréal, QC, Canada; <sup>†</sup>Department of Psychology, Université de Montréal, Montréal, QC, Canada; <sup>‡</sup>STI Unit, Institut national de santé publique du Québec, Montréal, QC, Canada; <sup>§</sup>VUVA Clinic, Centre Hospitalier de l'Université de Montréal and Hôpital St-Luc, Montréal, QC, Canada

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### ABSTRACT

**Introduction.** Entry dyspareunia is a sexual health concern which affects about 21% of women in the general population. Characterized by pain provoked during vaginal penetration, introital dyspareunia has been shown by controlled studies to have a negative impact on the psychological well-being, sexual function, sexual satisfaction, and quality of life of afflicted women. Many cognitive and affective variables may influence the experience of pain and associated psychosexual problems. However, the role of the partner's cognitive responses has been studied very little.

**Aim.** The aim of the present study was to examine the associations between partners' catastrophizing and their perceptions of women's self-efficacy at managing pain on one side and women's pain intensity, sexual function, and sexual satisfaction on the other.

**Methods.** One hundred seventy-nine heterosexual couples (mean age for women = 31, SD = 10.0; mean age for men = 33, SD = 10.6) in which the woman suffered from entry dyspareunia participated in the study. Both partners completed quantitative measures. Women completed the Pain Catastrophizing Scale and the Painful Intercourse Self-Efficacy Scale. Men completed the significant-other versions of these measures.

**Main Outcome Measures.** Dependent measures were women's responses to (i) the Pain Numeric Visual Analog Scale; (ii) the Female Sexual Function Index; and (iii) the Global Measure of Sexual Satisfaction scale.

**Results.** Controlled for women's pain catastrophizing and self-efficacy, results indicate that higher levels of partner-perceived self-efficacy and lower levels of partner catastrophizing are associated with decreased pain intensity in women with entry dyspareunia, although only partner catastrophizing contributed unique variance. Partner-perceived self-efficacy and catastrophizing were not significantly associated with sexual function or satisfaction in women.

**Conclusions.** The findings suggest that partners' cognitive responses may influence the experience of entry dyspareunia for women, pointing toward the importance of considering the partner when treating this sexual health problem. **Lemieux AJ, Bergeron S, Steben M, and Lambert B. Do romantic partners' responses to entry dyspareunia affect women's experience of pain? The roles of catastrophizing and self-efficacy. J Sex Med 2013;10:2274–2284.**

**Key Words.** Catastrophizing; Self-Efficacy; Partner; Sexual Function; Sexual Satisfaction; Provoked Vestibulodynia; Pain; Vulvodynia; Dyspareunia; Couple Therapy; Vestibulitis; Sexual Pain

### Introduction

Painful sexual intercourse, also known as dyspareunia, is a common and distressing female sexual health condition. According to epi-

demiological data, approximately 21% of women between the ages of 18 and 29 suffer from entry dyspareunia, soon to be termed *genito-pelvic pain/penetration disorder* in the upcoming *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*

[1,2]. The most common form of entry dyspareunia in women is provoked vestibulodynia (PVD), a condition which affects 12% of women in the general population [3] and is described by the International Society for the Study of Vulvovaginal Disease as a "burning pain, occurring in the absence of relevant visible findings or a specific, clinically identifiable, neurologic disorder" [4]. Women with PVD report significant impairments in sexual functioning, namely lower levels of sexual desire and arousal and lower frequency of intercourse [5]. Furthermore, they have higher levels of depressive symptoms and psychological distress, as well as lower levels of sexual satisfaction and sexual self-esteem [6,7]. Many women also report feelings of guilt, shame, and inadequacy vis-à-vis their partner [8].

An important model used to explain the development and maintenance of chronic pain conditions is the fear-avoidance model, according to which a behavior is avoided because of anxiety and fear concerning the elicitation of pain, which in turn leads to heightened disability and pain [9]. Efficacy expectations, as well as negative appraisals about pain such as catastrophizing, are pivotal concepts when explaining pain-related fear [10-13]. The fear-avoidance model has been studied both cross-sectionally and prospectively with dyspareunia populations, showing that higher patient levels of anxiety, fear of pain, hypervigilance, and catastrophizing, as well as lower levels of patient self-efficacy, modulate pain intensity and associated sexual difficulties [14-16]. Although interesting, this model focuses exclusively on intra-individual factors and neglects the important role of the partner in experiences of pain and sexuality [17,18].

In entry dyspareunia, where the partner is often directly involved in the onset and maintenance of the pain, very few studies have explored his role in the experience of pain and other associated symptoms. A study of women with PVD showed that perceived solicitous responses (i.e., demonstrations of sympathy and excessive concern) in partners were associated with heightened pain intensity, and perceived facilitative partner responses (i.e., encouraging pain-coping efforts) were associated with higher sexual satisfaction in women [19]. In a cross-sectional study involving 43 PVD couples, it was found that increased partner solicitude and hostility were correlated with higher pain intensity during vaginal penetration [20]. A larger cross-sectional study yielded similar results, showing that more-solicitous

partner responses were associated with higher levels of pain intensity but also with greater sexual satisfaction in women [21]. Furthermore, partner responses were not associated with women's sexual function [21]. It was also shown that the relationship between woman-perceived partner solicitous responses and pain was mediated by catastrophizing and self-efficacy, in that greater solicitous responses were associated with higher catastrophizing, which was associated with more pain [22]. *Solicitousness* and *hostility* refer to behavioral responses that directly influence a situation in which pain appears and are easily observed by both parties. However, few studies have investigated the possible influence of the partner's cognitions, including catastrophizing and perceptions of the woman's self-efficacy, in the experience of entry dyspareunia.

Specifically, catastrophizing, which is defined as an exaggerated and negative set of cognitions during real or anticipated painful experiences, is thought to be the most robust psychological predictor of persistent pain, accounting for 7% to 31% of pain variation [23]. The relationship between catastrophizing and pain has been demonstrated in samples of chronic pain patients, postsurgical pain patients, and athletes, as well as asymptomatic individuals [23]. In the context of PVD, cross-sectional data show that higher levels of patient catastrophizing are linked to heightened pain [14]. Catastrophizing and pain behavior are defined as help-seeking and exaggerated displays of illness in the social context [23]. Interestingly, catastrophizing, as viewed by the communal coping model, is not necessarily aimed at pain reduction, but more toward maximizing proximity, assistance, or empathy from the environment. In this sense, the more one catastrophizes, the more people in one's environment are likely to perceive the pain as unmanageable [23]. Catastrophizing, in the context of the couple relationship, has mostly been studied as a variable pertaining to the patient, in terms of how it relates to partner responses [24]. For example, higher catastrophizing in patients may be associated with greater support from the partner [25], more solicitous behavior [26], or, in contrast, to negative and critical responses from the partner [27]. However, the role of partner catastrophizing has received very little empirical attention, in particular in women with entry dyspareunia. The few studies that have examined this variable show that partner catastrophizing is associated with higher levels of pain, disability, and depressive symptoms in individuals with chronic

pain, such as osteoarthritis, scoliosis, and postsurgical pain [28,29]. In light of this, and because entry dyspareunia patients' catastrophizing has been shown to correlate significantly with their pain experience, partner catastrophizing may also be associated with vulvovaginal pain, especially given the interpersonal context in which entry dyspareunia occurs.

Self-efficacy, defined as the confidence an individual has in his or her ability to perform a specific task [30], is also an important variable influencing the experience of pain. Higher levels of patient self-efficacy are related to lower degrees of pain and associated symptoms such as disability [31]. In addition, it has been found that higher levels of self-efficacy are associated with less intense pain in osteoarthritis patients [32] and with lower disability scores in patients with musculoskeletal pain [33]. In women with PVD, higher levels of self-efficacy are associated with better sexual functioning and less pain [33]. From an interpersonal perspective, the confidence that patients and family members have in their capacity to manage pain and associated impairments in functioning may be an important factor with regard to both sides' well-being [31,32]. Indeed, higher caregiver-perceived self-efficacy has been shown to correlate negatively with disability and negative mood in patients experiencing pain from cancer [34]. In the case of entry dyspareunia, where the "caregiver" (partner) is also in a sense "causing" the pain, his perception of the woman's self-efficacy may be all the more significant in her experience of pain and associated sexual impairment.

The importance of studying cognitive variables, as opposed to behavioral ones, has been demonstrated in both the field of pain and that of sexual dysfunction. In the context of pain, it has been found that cognitive variables are an important factor in the transition from a short-term pain to a long-term disabling condition, as explained by the *fear-avoidance model* [35]. Furthermore, cognitive variables such as catastrophizing and self-efficacy are malleable targets of intervention and have a strong prognostic value with regard to disability [33,36]. When it comes to sexuality, certain cognitions, for example high performance beliefs, are correlated with sexual dysfunction in both men and women [37]. Focusing on the patient's and the partner's negative cognitions in the case of entry dyspareunia could help both individuals manage the pain as well as ameliorate their sexual experience together.

## Aim

The goal of the present study was to examine the role of partner-perceived self-efficacy and partner catastrophizing in the experience of pain, sexual functioning, and sexual satisfaction of women with entry dyspareunia.

The main hypotheses were that higher levels of partner-perceived self-efficacy and lower levels of partner catastrophizing would be associated with decreased pain intensity, greater sexual satisfaction, and better sexual function in women with entry dyspareunia.

## Methods

### Participants

Participating couples were recruited through referrals by health professionals and advertisements in local newspapers and women's magazines as well as via our laboratory's website and flyers on university billboards. Participants were initially screened by telephone in order to determine their eligibility based on selection criteria for the study, notably the presence of entry dyspareunia symptoms. The screening questionnaire has been successfully used in previous studies performed by our research group [21,22]. Inclusion criteria consisted of the following: (i) pain during intercourse causing subjective distress, present during most penetration attempts (75% of the time), for at least 6 months; (ii) pain limited to activities where there is penetration or pressure applied to the vestibule (e.g., cycling); (iii) women aged between 18 and 45; (iv) heterosexual couples in current relationship for at least 6 months. Exclusion criteria were the following: (i) pain not clearly linked to pressure to the vestibule; (ii) major medical or psychiatric illness; (iii) presence of an active yeast infection, vaginismus, deep dyspareunia, or dermatological lesions; (iv) pregnancy. Male partners did not have to meet any additional inclusion criteria and were asked to participate via their eligible companions.

Following a detailed telephone screening procedure, eligible couples were sent self-report questionnaires and consent forms via regular mail, along with preaddressed and prestamped envelopes. Women recruited through health professionals were screened and given envelopes in person, for themselves and their partners. In order to compensate couples for their participation, a 30-minute telephone consultation with a sexologist member of the research team was offered. The

entire protocol was approved by our institution's ethical review board.

## Measures

### Main Outcome Measures

#### Women's Pain Intensity

Pain intensity was measured using the Pain Numeric Visual Analog Scale (PNVAS), a horizontal 10-cm line with legends at both extremities: at the left, "0—no pain," and at the right, "10—worst pain ever," with digits 1 to 9 in between. Participants were invited to circle the answer best describing their pain during the last 6 months. The validity of this measure has been well demonstrated in past research, as the PNVAS has been found to correlate significantly with other pain measures [38].

#### Women's Sexual Functioning

The Female Sexual Function Index (FSFI) [39] was also completed by women in the sample. The FSFI comprises 19 items measuring five dimensions: (i) desire; (ii) lubrication; (iii) orgasm; (iv) satisfaction; and (v) pain. A higher score indicates better sexual function, and scores range from 2 to 36. This questionnaire has demonstrated very good psychometric properties [40]. Furthermore, a study using the French translation of this questionnaire confirmed the original factor structure and excellent internal consistency [41].

#### Women's Sexual Satisfaction

Sexual satisfaction was measured using the Global Measure of Sexual Satisfaction scale (GMSEX) [42], which comprises five items. Participants must rate their sexual satisfaction within their relationship with their partner on five seven-point bipolar scales: good–bad, pleasant–unpleasant, positive–negative, satisfying–unsatisfying, valuable–worthless. Scores range between 5 and 35, and higher scores are indicative of greater sexual satisfaction. Reliability and validity for this scale have been well demonstrated [42], and a French translation of the questionnaire showed excellent internal consistency reliability estimates [41].

### Independent Variables

#### Pain Catastrophizing

Catastrophizing was assessed using the Pain Catastrophizing Scale (PCS) [43]. This questionnaire includes 13 items measuring three dimensions: (i) rumination; (ii) magnification; and (iii) helplessness. Scores range from 0 to 52, with a higher

score indicating greater catastrophizing. This scale's reliability and validity have been well established [43,44]. Partners completed the significant-other version of the scale, which has also been shown to be a reliable and valid measure with a stable factor structure across gender and racial groups [22] and has been used in a variety of chronic pain populations [22,45]. A French validation study of this tool demonstrated a high degree of internal consistency as well as stability, comparable with the original English-language scale [46].

#### Pain Self-Efficacy

Self-efficacy in relation to dyspareunia was measured using the Painful Intercourse Self-Efficacy Scale (PISES) [14], an adapted version of the Arthritis Self-Efficacy Scale [45]. Participants indicated their perceived ability to carry out sexual activity or to achieve specific outcomes in pain management. This questionnaire comprises 20 items assessing three dimensions: (i) pain; (ii) functioning; and (iii) other symptoms. Scores range from 10 to 100, where a higher score indicates greater self-efficacy. Romantic partners' perception of women's pain self-efficacy was measured using the partner version of the questionnaire. This adaptation has been used in other studies carried out by our research group and has demonstrated good internal consistency, as well as a factor structure identical to the original version, in a French Canadian population [6].

### Data Analysis

Prior to the analysis, the data were examined for outliers, missing data, and assumption violations, as well as to target potential covariates. Pearson correlations (for continuous variables), Spearman correlations (for noncontinuous variables), and descriptive statistics were computed. Multiple hierarchical regressions were conducted in order to evaluate the relative contribution of partner catastrophizing and partner-perceived self-efficacy to women's pain intensity, sexual satisfaction, and sexual functioning while controlling for women's pain catastrophizing and self-efficacy, using a  $P < 0.05$  level of significance.

## Results

### Sample Characteristics

The final sample comprised 179 couples, selected from a pool of 233 couples. Of the initial pool, 17 couples were excluded because one of the partners

did not return his or her questionnaire. Six couples were removed from the database on the basis of low scores on the PNVAS (0 or 1), which made them outliers. The remaining 31 couples were excluded because of missing data. Of the 179 couples, 78 were recruited following a visit with a gynecologist (and received a PVD diagnosis), 87 were recruited through advertisements in magazines, newspapers, websites, and on billboards, and the remaining 14 couples were recruited through other sources, such as referrals from other medical and nonmedical health professionals, word of mouth, previous studies, and the like. Sample characteristics did not significantly differ from those in studies in which a gynecological examination was performed on the entire sample [14]. The sample of couples in this study was also used to conduct another cross-sectional study examining catastrophizing and self-efficacy as mediators of the relation between partner responses and pain in entry dyspareunia couples [22].

Sociodemographic characteristics of study participants are presented in Table 1. Mean age for

women was 31 years (SD = 10.0) and that of partners was 33 years (SD = 10.6). Participants were found to be fairly well-educated, with a mean of 16 years of education for women and partners (SD = 2.9 and 3.2, respectively). Mean relationship duration was 6 years (SD = 6.6), but with much variation between couples. Women reported a mean pain duration of 6 years (SD = 6.0). These results mirror those obtained in previous studies pertaining to PVD [47,48].

Mean scores and SD for sexual functioning (FSFI-W), sexual satisfaction (GMSEX-W), and pain intensity (PNVAS-W) for women, as well as catastrophizing (PCS-W and PCS-P) and perceptions of women's self-efficacy (PISES-W and PISES-P) for both women and partners, can also be found in Table 1. The mean levels of catastrophizing for women and partners were, respectively, 29.1 and 28.6 (SD = 10.3 and 9.7), suggesting a high degree of catastrophizing, with scores above 24 or below 15 considered high and low catastrophizers, respectively [43]. However, no cutoffs have been reported in the peer-reviewed literature concerning clinical outcomes. The mean levels of pain self-efficacy in women and perception of women's self-efficacy by their partners were, respectively, 59.7 and 56.9 (SD = 13.9 and 15.7) and were similar to those of comparable studies using the PISES [14]. For dependent variables, the mean sexual functioning score for women (mean = 17.7; SD = 4.1) indicates sexual dysfunction in the clinical range, the cutoff point being below 26 [49]. The mean level of sexual satisfaction of women (mean = 22.9; SD = 6.2) resembled that reported in other studies conducted with samples of women with PVD [41]. The mean score of pain intensity in women (mean = 7.2; SD = 1.7) indicates that the experience of pain from entry dyspareunia resembles that of other chronic pain populations [50], as well as that of similar studies pertaining to PVD [47,51].

#### Zero-Order Correlations among Variables

Simple correlations between measures of pain intensity, sexual satisfaction, and sexual functioning of women (dependent variables), as well as measures of women's and partners' pain catastrophizing and perceptions of women's pain self-efficacy (independent variables) are shown in Table 2. First, none of the sociodemographic variables correlated significantly with the dependent measures. Partner catastrophizing was significantly and positively correlated with women's pain intensity ( $r = 0.35$ ,  $R < 0.01$ ), and catastrophizing

**Table 1** Descriptive statistics of the sample (N = 179)

Age of woman (years), mean (SD)	30.50 (10.02)
Age of partner (years), mean (SD)	33.30 (10.57)
Education of woman (years), mean (SD)	16.20 (2.85)
Education of partner (years), mean (SD)	15.66 (3.21)
Marital status, n (%)	
Dating	25 (14.0)
Cohabiting	112 (62.6)
Married	41 (22.9)
Relationship duration (years), mean (SD)	6.36 (6.58)
Pain duration (years), mean (SD)	5.57 (5.95)
Cultural affiliation of woman, n (%)	
French Canadian	163 (91.1)
English Canadian	2 (1.1)
European	6 (3.4)
Other	8 (4.5)
Cultural affiliation of partner, n (%)	
French Canadian	134 (74.9)
English Canadian	11 (6.1)
European	6 (3.4)
Other	8 (19.9)
PNVAS-W score, mean (SD)*	7.21 (1.65)
GMSEX-W score, mean (SD) <sup>†</sup>	22.93 (6.24)
FSFI-W score, mean (SD) <sup>‡</sup>	17.71 (4.05)
PCS-P score, mean (SD) <sup>§</sup>	28.61 (9.65)
PCS-W score, mean (SD) <sup>§</sup>	29.08 (10.33)
PISES-P score, mean (SD) <sup>¶</sup>	56.88 (15.69)
PISES-W score, mean (SD) <sup>¶</sup>	59.66 (13.94)

\*Range 0–10.

<sup>†</sup>Range 5–35.

<sup>‡</sup>Range 2–36.

<sup>§</sup>Range 0–52.

<sup>¶</sup>Range 10–100.

PNVAS-W = Pain Numeric Visual Analog Scale—Women's Version; GMSEX-W = Global Measure of Sexual Satisfaction—Women's Version; FSFI-W = Female Sexual Function Index—Women's Version; PCS-P = Pain Catastrophizing Scale—Partner Version; PCS-W = Pain Catastrophizing Scale—Women's Version; PISES-P = Painful Intercourse Self-Efficacy Scale—Partner Version; PISES-W = Painful Intercourse Self-Efficacy Scale—Women's Version

**Table 2** Zero-order correlations between pain intensity, sexual satisfaction, sexual functioning, and partner variables (pain catastrophizing and perceptions of women's self-efficacy) and covariates (women's catastrophizing and self-efficacy)

	PNVAS-W	GMSEX-W	FSFI-W	PCS-P	PISES-P	PCS-W
GMSEX-W	-0.086					
FSFI-W	-0.258**	-0.008				
PCS-P	0.352**	-0.191*	-0.053			
PISES-P	-0.308**	0.214**	0.205**	-0.313**		
PCS-W	0.433**	-0.181*	-0.208**	0.160*	-0.300**	
PISES-W	-0.407**	0.409**	0.183*	-0.118	0.358**	-0.422**

\* $P < 0.05$ , \*\* $P < 0.01$ .

PNVAS-W = Pain Numeric Visual Analog Scale—Women's Version; GMSEX-W = Global Measure of Sexual Satisfaction—Women's Version; FSFI-W = Female Sexual Function Index—Women's Version; PCS-P = Pain Catastrophizing Scale—Partner Version; PISES-P = Painful Intercourse Self-Efficacy Scale—Partner Version; PCS-W = Pain Catastrophizing Scale—Women's Version; PISES-W = Painful Intercourse Self-Efficacy Scale—Women's Version

( $r = 0.16$ ,  $R < 0.05$ ), was significantly and negatively correlated with sexual satisfaction ( $r = -0.19$ ,  $R < 0.05$ ), but was not correlated with sexual functioning ( $r = -0.053$ ) or self-efficacy ( $r = -0.12$ ). Partners' perception of the women's degree of self-efficacy with regards to her ability to manage her pain (PISES-P) was found to correlate significantly and negatively with women's pain intensity (PNVAS-W;  $r = -0.31$ ,  $P < 0.01$ ) and catastrophizing (PCS-W;  $r = -0.30$ ,  $P < 0.01$ ), and was also found to correlate significantly and positively with sexual satisfaction (GMSEX-W;  $r = 0.21$ ,  $P < 0.01$ ), sexual functioning (FSFI-W;  $r = 0.21$ ,  $P < 0.01$ ), and women's own degree of self-efficacy (PISES-W;  $r = 0.36$ ,  $P < 0.01$ ).

### Correlates of Pain Intensity

A hierarchical regression analysis, shown in Table 3, was conducted in order to determine the relative contribution of each partner variable to pain intensity. The independent variables, i.e., partner catastrophizing and perceptions of women's self-efficacy, were added together to the regression model to evaluate their relative contribution to pain intensity, after controlling for women's catastrophizing and self-efficacy. The model significantly explained 31.1% of the variance in the pain intensity of women with entry dyspareunia, with 7.5% accounted for by partner variables ( $F[4, 174] = 21.040$ ,  $P < 0.001$ ). Examination of the  $\beta$  weights for this model indicated that only partner catastrophizing contributed unique variance ( $\beta = 0.262$ ,  $P < 0.001$ ) to the prediction of pain intensity.

### Correlates of Sexual Satisfaction

A second hierarchical regression analysis was carried out examining the contribution of partner pain catastrophizing (PCS-P) and perceptions of women's self-efficacy (PISES-P) to women's level

of sexual satisfaction, controlling for women's catastrophizing and self-efficacy. This model, shown in Table 4, accounted significantly for 17.1% of the variance in sexual satisfaction of the women in our sample, with 2.2% accounted for by partner variables only ( $F[4, 174] = 10.170$ ,  $P < 0.001$ ). An exploration of  $\beta$  weights showed that none of the partner variables contributed

**Table 3** Results of hierarchical regression analyses for partner variables predicting women's pain intensity

	B	SE(B)	$\beta$
Step 1			
PCS-W	0.05	0.01	0.32**
PISES-W	-0.03	0.01	-0.27**
Step 2			
PCS-W	0.04	0.01	0.27**
PISES-W	-0.03	0.01	-0.24**
PCS-P	0.05	0.01	0.26**
PISES-P	-0.01	0.01	-0.06

\*\* $P < 0.01$ . $R^2 = 0.25$  for Step 1;  $\Delta R^2 = 0.08$  for Step 2.

PCS-W = Pain Catastrophizing Scale—Women's Version; PISES-W = Painful Intercourse Self-Efficacy Scale—Women's Version; PCS-P = Pain Catastrophizing Scale—Partner Version; PISES-P = Painful Intercourse Self-Efficacy Scale—Partner Version

**Table 4** Results of hierarchical regression analyses for partner variables predicting women's sexual satisfaction

	B	SE(B)	$\beta$
Step 1			
PCS-W	-0.01	0.05	-0.01
PISES-W	0.18	0.03	0.41**
Step 2			
PCS-W	0.01	0.05	0.02
PISES-W	0.17	0.04	0.39**
PCS-P	-0.09	0.05	-0.14
PISES-P	0.02	0.03	0.04

\*\* $P < 0.01$ . $R^2 = 0.16$  for Step 1;  $\Delta R^2 = 0.02$  for Step 2.

PCS-W = Pain Catastrophizing Scale—Women's Version; PISES-W = Painful Intercourse Self-Efficacy Scale—Women's Version; PCS-P = Pain Catastrophizing Scale—Partner Version; PISES-P = Painful Intercourse Self-Efficacy Scale—Partner Version

**Table 5** Results of hierarchical regression analyses for partner variables predicting women's sexual function

	B	SE(B)	$\beta$
Step 1			
PCS-W	-0.06	0.03	-0.16*
PISES-W	0.03	0.02	0.12
Step 2			
PCS-W	-0.05	0.03	-0.14
PISES-W	0.02	0.02	0.08
PCS-P	0.01	0.03	0.02
PISES-P	0.04	0.02	0.14

\* $P < 0.05$ . $R^2 = 0.04$  for Step 1;  $\Delta R^2 = 0.02$  for Step 2.

PCS-W = Pain Catastrophizing Scale—Women's Version; PISES-W = Painful Intercourse Self-Efficacy Scale—Women's Version; PCS-P = Pain Catastrophizing Scale—Partner Version; PISES-P = Painful Intercourse Self-Efficacy Scale—Partner Version

unique variance to sexual satisfaction. However, a trend was found for partner pain catastrophizing ( $\beta = -0.136$ ,  $P = 0.060$ ).

### Correlates of Sexual Functioning

Finally, a hierarchical regression analysis was performed in order to evaluate the relative contribution of partner variables to global sexual functioning of women with entry dyspareunia, after controlling for women's variables, shown in Table 5. The resulting model significantly explained 4.9% of the variance in sexual functioning, with partner variables accounting for 1.6% of this variance ( $F[4, 174] = 3.308$ ,  $P = 0.012$ ). A further examination of  $\beta$  weights showed that none of the partner variables contributed unique variance to the prediction of sexual functioning.

### Discussion

The aim of the present study was to examine the role of partners' catastrophizing and perceptions of women's self-efficacy in the experience of pain, sexual functioning, and sexual satisfaction of women with entry dyspareunia. As hypothesized, higher levels of partner-perceived self-efficacy and lower levels of partner catastrophizing were associated with less pain intensity in women, independent of women's pain catastrophizing and self-efficacy. However, the hypotheses concerning sexual function and satisfaction were not confirmed, as partner catastrophizing and partner-perceived self-efficacy did not significantly affect women's sexuality outcomes when women's pain catastrophizing and self-efficacy were controlled for.

First, the finding that higher levels of partner-perceived self-efficacy and lower levels of partner catastrophizing were associated with decreased

pain intensity and that only partner catastrophizing contributed unique variance to the outcome is in line with previous findings in entry dyspareunia research [22]. People who catastrophize not only experience greater pain, they also perceive more intense pain in others [52]. This in turn may influence their behavior toward a sick partner, making them more solicitous or hostile—partner behaviors often associated with increased pain intensity in women with PVD [6,21]. Furthermore, partner catastrophizing has been shown to strengthen the association between the patients' catastrophizing and depressive symptoms [29]. In this sense, partners who catastrophize create a negative and exaggerated dialogue, which in turn heightens pain awareness and intensity in patients. Moreover, the fact that both partner-perceived self-efficacy and catastrophizing together significantly contributed to pain corroborates findings from another study which demonstrated that higher pain catastrophizing is associated with lower self-efficacy in that self-efficacy for pain mediates the relationship between catastrophizing and pain [53]. Partners who believe that the patient's pain is controllable are more likely to give lower pain and disability ratings, as are patients who believe the same, who also show less pain behavior [54]. In the context of PVD, low perception of women's self-efficacy by partners may translate into avoidance behaviors such as withdrawing from sexual activity or other forms of physical intimacy, which may in turn hinder women's ability to practice pain reduction strategies, thus heightening the pain experience through disuse and hypervigilance, as conceptualized by the fear-avoidance model [21,55].

Second, the finding that neither partner-perceived self-efficacy nor partner catastrophizing significantly contribute to sexual satisfaction or sexual function in women with entry dyspareunia invalidates our initial hypotheses. These results suggest that perhaps pain and sexuality outcomes in women with dyspareunia are correlated with distinct factors. In contrast, partner catastrophizing has been found to correlate with pain interference in individuals with chronic pain [29]. Additionally, patient catastrophizing and low self-efficacy have generally been associated with heightened disability [23,31]. It is possible that the reason these results differ for entry dyspareunia couples is that many women continue to have sex out of guilt toward their partners, and frequency of intercourse is one of the dimensions of sexual function [56]. Furthermore, it has been found that

sexual functioning and pain may be independent and distinct phenomena, as these two variables are not significantly correlated in dyspareunia samples [57]. The fact that partner catastrophizing and low partner-perceived self-efficacy lead to greater pain but are not significantly associated with sexual function further supports this distinction.

Sexual satisfaction has seldom been studied in relation to partner variables, although partner solicitousness has been found to be associated with greater sexual satisfaction in women with entry dyspareunia [21]. In women who report no sexual dysfunction, partners' perceptions of women's sexual confidence are not significantly related to women's sexual satisfaction, which suggests that women's own perceptions may be more predictive of their sexual satisfaction than men's perceptions of their female partners [58]. In light of this, our findings may indicate that although partners' behaviors (such as solicitude) may influence women's sexuality, their cognitions could potentially have little impact on women's sexual satisfaction. This might be explained by the fact that sexual satisfaction in itself is, as defined by Byers, Demmons, and Lawrance, "an affective response arising from one's subjective evaluation of the positive and negative dimensions associated with one's sexual relationship," and therefore relies more on women's cognitive assessment than on anything else [59].

It is important to note certain limitations of this study. First, because of the cross-sectional nature of the design, a causal association between the independent and dependent variables cannot be established. Further studies should be conducted using a longitudinal methodology in order to establish temporal relations between variables. Second, although the study criterion corresponded to a PVD diagnosis, participants were recruited from various sources, and only a portion were referred by a health professional with an official diagnosis. Finally, all measures were self-report.

Despite these limitations, this study has a number of strengths. It shows that partner cognitive responses to pain may contribute to increased pain intensity in women with entry dyspareunia. This provides additional support for the role of dyadic variables in the experience of painful sexual intercourse. Theoretically, this implies that a cognitive-behavioral conceptualization, such as Fordyce's operant learning model, can serve to partially explain the role the partner may take on as a reinforcing agent [9,60]. Further, this adds additional evidence to Sullivan's communal coping

model, which states that catastrophizing may serve to evoke empathy, maximize proximity, or solicit assistance from others in the social environment in order to increase the chances that distress will be managed within an interpersonal context [23]. The present findings also indicate that another partner cognitive variable—partner-perceived self-efficacy—may contribute to women's experience of entry dyspareunia.

However, these findings also suggest that dyspareunic women's sexuality may not be directly influenced by their partners' cognitions about their pain. Although some partner variables have been shown to be associated with women's sexual experience [61,62], partner cognitions may not be the most relevant factors to understand women's experience of their sexuality in a context of genital pain [63]. This may be explained by the fact that the subjective experience of women and their interpretation of the situation are more important than partners' views with regards to women's sexual satisfaction and function. Their cognitions about pain (for example their own self-efficacy with regards to pain management and degree of pain catastrophizing) may serve to better explain variations in their sexual experience. In this sense, women's own cognitive interpretations are more central to understanding their sexual outcomes, whereas the partners' cognitions may have a more distal influence. Furthermore, partner behaviors (such as hostility) may be more direct determinants of women's sexual satisfaction and function, as they immediately influence the sexual interaction.

Finally, these results may be of use in developing clinical interventions focused on the relationship aspects of entry dyspareunia that evaluate and work on both partners' reactions to the pain. Explaining to the couple how they both have a role to play in the experience of entry dyspareunia pain may serve to increase partner implication in treatment, diminish the identified patient's feelings of guilt, and help in motivation toward change.

## Conclusion

In conclusion, our findings suggest that partners' cognitions about entry dyspareunia correlate with the experience of genital pain in women. Specifically, controlling for women's pain catastrophizing and self-efficacy, higher levels of partner-perceived self-efficacy and lower levels of partner catastrophizing are associated with decreased pain intensity but do not significantly contribute to women's sexual satisfaction and sexual function. While

underlining the importance of working specifically on dyspareunic women's cognitions with regards to pain and sexuality, these results also point toward the importance of considering dyadic factors as an integral part of a comprehensive evaluation when treating this women's sexual health problem. Addressing dyadic factors early in the management course of entry dyspareunia may improve the success of therapeutic interventions.

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**Corresponding Author:** Sophie Bergeron, PhD, Department of Psychology, Université de Montréal, C.P. 6128 succursale Centre-Ville, Montréal, Québec, H3C 3J7, Canada. Tel: (514) 343-6111 # 5353; Fax: (514) 343-2285; E-mail: sophie.bergeron.2@umontreal.ca

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### Statement of Authorship

#### Category 1

##### (a) Conception and Design

Sophie Bergeron; Ashley J. Lemieux

##### (b) Acquisition of Data

Sophie Bergeron; Marc Steben; Bernard Lambert

##### (c) Analysis and Interpretation of Data

Ashley J. Lemieux; Sophie Bergeron

#### Category 2

##### (a) Drafting the Manuscript

Ashley J. Lemieux

##### (b) Revising It for Intellectual Content

Sophie Bergeron; Marc Steben; Bernard Lambert

#### Category 3

##### (a) Final Approval of the Completed Manuscript

Ashley J. Lemieux; Sophie Bergeron; Marc Steben; Bernard Lambert

### References

- 1 Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States. *J Am Med Assoc* 1999;281:537-44.
- 2 Binik Y. The DSM diagnostic criteria for dyspareunia: Review and recommendations prepared for the sexual and gender identity disorders work group for DSM-V. *Arch Sex Behav* 2010;39:292-303.
- 3 Harlow BL, Wise LA, Stewart EG. Prevalence and predictors of chronic lower genital tract discomfort. *Am J Obstet Gynecol* 2001;185:545-50.
- 4 Haefner HK, Collins ME, Davis GD, Edwards L, Foster DC, Hartmann ED, Kaufman RH, Lynch PJ, Margesson LJ, Moyal-Barracco M, Piper CK, Reed BD, Stewart EG, Wilkinson EJ. The vulvodynia guideline. *J Low Genit Tract Dis* 2005;9:40-51.
- 5 Arnold LD, Bachmann GA, Rosen R, Kelly S, Rhoads GG. Vulvodynia: Characteristics and associations with comorbidities and quality of life. *Obstet Gynecol* 2006;107:617-24.
- 6 Desrochers G, Bergeron S, Landry T, Jodoin M. Do psychosexual factors play a role in the etiology of provoked vestibulodynia? A critical review. *J Sex Marital Ther* 2008;34:198-226.
- 7 Gates EA, Galask RP. Psychological and sexual functioning in women with vulvar vestibulitis. *J Psychosom Obstet Gynaecol* 2001;22(4):221-8.
- 8 Ayling K, Ussher JM. "If sex hurts, am I still a woman?" The subjective experience of vulvodynia in hetero-sexual women. *Arch Sex Behav* 2008;37:294-304.
- 9 Vlaeyen JW, Linton SJ. Fear-avoidance and its consequences in chronic musculoskeletal pain: A state of the art. *Pain* 2000;85:317-32.
- 10 Turk DC, Meichenbaum D, Genest M. Pain and behavioral medicine. A cognitive-behavioral perspective. New York: Guilford Press; 1983.
- 11 Philips H. Avoidance behaviour and its role in sustaining chronic pain. *Behav Res Ther* 1987;25:273-9.
- 12 Lethem J, Slade PD, Troup JDG, Bentley G. Outline of a fear-avoidance model of exaggerated pain perceptions. *Behav Res Ther* 1983;21:401-8.
- 13 Waddell G, Newton M, Henderson I, Somerville D, Main C. A Fear-Avoidance Beliefs Questionnaire (FABQ) and the role of fear-avoidance beliefs in chronic low back pain and disability. *Pain* 1993;52:157-68.
- 14 Desrochers G, Bergeron S, Khalifé S, Dupuis MJ, Jodoin M. Fear avoidance and pain self-efficacy in relation to pain and sexual impairment in women with provoked vestibulodynia. *Clin J Pain* 2009;25(6):520-7.
- 15 Desrochers G, Bergeron S, Khalifé S, Dupuis MJ, Jodoin M. Provoked vestibulodynia: Psychological predictors of topical and cognitive-behavioral treatment outcome. *Behav Res Ther* 2010;48:106-15.
- 16 Payne KA, Binik YM, Amsel R, Khalife S. When sex hurts, anxiety and fear orient attention towards pain. *Eur J Pain* 2004;9:427-36.
- 17 Smith KB, Pukall CF. A systematic review of relationship adjustment and sexual satisfaction among women with provoked vestibulodynia. *J Sex Res* 2011;48:166-91.
- 18 Keefe F, Porter L. Pain catastrophizing in the context of satisfaction with spousal responses: New perspectives and new opportunities. *Pain* 2007;131(1-2):1-2.
- 19 Rosen NO, Bergeron S, Glowacka M, Delisle I, Baxter ML. Harmful or helpful: Perceived solicitous and facilitative partner responses are differentially associated with pain and sexual satisfaction in women with provoked vestibulodynia. *J Sex Med* 2012;9(9):2351-60.
- 20 Desrosiers M, Bergeron S, Meana M, Leclerc B, Binik YM, Khalifé S. Psychosexual characteristics of vestibulodynia couples: Partner solicitousness and hostility are associated with pain. *J Sex Med* 2008;5:418-27.
- 21 Rosen NO, Bergeron S, Leclerc B, Lambert B, Steben M. Woman and partner-perceived partner responses predict pain and sexual satisfaction in provoked vestibulodynia (PVD) couples. *J Sex Med* 2010;7:3715-24.

- 22 Rosen NO, Bergeron S, Lambert B, Steben M. Provoked vestibulodynia: Partner and patient catastrophizing and dyadic adjustment as mediators of the associations between partner responses, pain and sexual satisfaction. *Arch Sex Behav* 2012;41(1):129–41.
- 23 Sullivan MJL, Thorn B, Haythornthwaite JA, Keefe F, Martin M, Bradley LA, Lefebvre JC. Theoretical perspectives on the relation between catastrophizing and pain. *Clin J Pain* 2001;17:52–64.
- 24 Quartana PJ, Campbell CM, Edwards RR. Pain catastrophizing: A critical review. *Expert Rev Neurother* 2009;9(5):745–58.
- 25 Keefe FJ, Lipkus I, Lefebvre JC, Hurwitz H, Clipp E, Smith J, Porter L. The social context of gastrointestinal cancer pain: A preliminary study examining the relation of patient pain catastrophizing to patient perceptions of social support and caregiver stress and negative responses. *Pain* 2003;103(1–2):151–6.
- 26 Giardino ND, Jensen MP, Turner JA, Ehde DM, Cardenas DD. Social environment moderates the association between catastrophizing and pain among persons with a spinal cord injury. *Pain* 2003;106(1–2):19–25.
- 27 Boothby JL, Thorn BE, Overduin LY, Ward CL. Catastrophizing and perceived partner responses to pain. *Pain* 2004;109(3):500–6.
- 28 Cano A. Pain catastrophizing and social support in married individuals with chronic pain: The moderating role of pain duration. *Pain* 2004;110:656–64.
- 29 Cano A, Leonard MT, Franz A. The significant other version of the Pain Catastrophizing Scale (PCS-S): Preliminary validation. *Pain* 2005;119:26–37.
- 30 Bandura A. *Self-efficacy: The exercise of control*. New York: W.H. Freeman; 1997.
- 31 Porter LS, Keefe FJ, Garst J, McBride CM, Baucom D. Self-efficacy for managing pain, symptoms, and function in patients with lung cancer and their informal caregivers: Associations with symptoms and distress. *Pain* 2008;137:306–15.
- 32 Porter LS, Keefe FJ, Wellington C, de Williams A. Pain communication in the context of osteoarthritis: Patient and partner self-efficacy for pain communication and holding back from discussion of pain and arthritis-related concerns. *Clin J Pain* 2008;24(8):662–8.
- 33 Denison E, Asenlöf P, Lindberg P. Self-efficacy, fear avoidance, and pain intensity as predictors of disability in sub-acute and chronic musculoskeletal pain patients in primary health care. *Pain* 2004;111:245–52.
- 34 Keefe FJ, Ahles T, Porter L, Sutton L, McBride C, Pope MS, McKinstry E, Furstenberg C, Dalton J, Baucom DA. The self-efficacy of family caregivers for helping cancer patients manage pain at end-of-life. *Pain* 2003;103:157–62.
- 35 Casey C, Greenberg M, Nicassio P, Harpin R, Hubbard D. Transition from acute to chronic pain and disability: A model including cognitive, affective, and trauma factors. *Pain* 2008;134:69–79.
- 36 Pincus T, Burton A, Vogel S, Field A. A systematic review of psychological factors as predictors of chronicity/disability in prospective cohorts of low back pain. *Spine* 2002;27(5):109–20.
- 37 Nobre PJ, Pinto-Gouveia J, Gomes FA. Sexual dysfunctional beliefs questionnaire: An instrument to assess sexual dysfunctional beliefs as vulnerability factors to sexual problems. *Sex Relationsh Ther* 2003;18:171–204.
- 38 Jensen MP, Karoly P. Self-report scale and procedures for assessing pain in adults. In: Turk DC, Melzack R, eds. *Handbook of pain assessment*. New York: The Guilford Press; 2001:15–34.
- 39 Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, Fergusson D, D'Agostino R. The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *J Sex Marital Ther* 2000;26(2):191–208.
- 40 Daker-White G. Reliable and valid self-report outcome measures in sexual (dys)function: A systematic review. *Arch Sex Behav* 2002;31(2):197–209.
- 41 Jodoïn M, Bergeron S, Khalifé S, Dupuis MJ, Desrochers G, Leclerc B. Attributions about pain as predictors of psychological symptomatology, sexual function, and dyadic adjustment in women with vestibulodynia. *Arch Sex Behav* 2011;40(1):87–97.
- 42 Lawrance K, Byers ES. Interpersonal exchange model of sexual satisfaction questionnaire. In: Davis CM, Yarber WL, Baureman R, Schreer G, Davis SL, eds. *Sexuality related measures: A compendium*. 2nd edition. Thousand Oaks, CA: Sage; 1998: 514–9.
- 43 Sullivan MJL, Bishop S, Pivik J. The Pain Catastrophizing Scale: Development and validation. *Psychol Assess* 1995;7:524–32.
- 44 Osman A, Barrios FX, Gutierrez PM, Kopper BA, Merrifield T, Gritman L. The Pain Catastrophizing Scale: Further psychometric evaluation with adult samples. *J Behav Med* 2000;23:351–65.
- 45 Leonard M, Cano A. Pain affects spouses too: Personal experience with pain and catastrophizing as correlates of spouse distress. *Pain* 2006;126:139–46.
- 46 French DJ, Noël M, Vigneau F, French JA, Cyr CP, Evans RT. L'échelle de dramatisation face à la douleur PCS-CF: Adaptation canadienne en langue française de l'échelle «Pain Catastrophizing Scale». *Revue Canadienne des Sciences du Comportement* 2005;37(3):181–92.
- 47 Bergeron S, Binik YM, Khalifé S, Pagidasc K, Glazer HI, Meana M, Amsela R. A randomized comparison of group cognitive-behavioral therapy, surface electromyographic biofeedback, and vestibulectomy in the treatment of dyspareunia resulting from vulvar vestibulitis. *Pain* 2001;91:297–306.
- 48 Brotto LA, Basson R, Gehring D. Psychological profiles among women with vulvar vestibulitis syndrome: A chart review. *J Psychosom Obstet Gynecol* 2003;24:195–203.
- 49 Wiegel M, Meston C, Rosen R. The Female Sexual Function Index (FSFI): Cross-validation and development of clinical cutoff scores. *J Sex Marital Ther* 2005;31:1–20.
- 50 Grilo RM, Treves R, Preux PM, Vergne-Salle P, Bertin P. Clinically relevant VAS pain score change in patients with acute rheumatic conditions. *Joint Bone Spine* 2007;74:358–61.
- 51 Meana M, Binik YM, Khalifé S, Cohen D. Dyspareunia: Sexual dysfunction or pain syndrome? *J Nerv Ment Dis* 1997;185:561–9.
- 52 Sullivan MJL, Martel MO, Tripp DA, Savard A, Crombez G. Catastrophic thinking and heightened perception of pain in others. *Pain* 2006;123:37–44.
- 53 Shelby RA, Somers TJ, Keefe FJ, Pells JJ, Dixon KE, Blumenthal JA. Domain specific self-efficacy mediates the impact of pain catastrophizing on pain and disability in overweight and obese osteoarthritis patients. *J Pain* 2008;9(10):912–9.
- 54 Cano A, Miller LR, Lorie A. Spouse beliefs about partner chronic pain. *J Pain* 2009;10:486–92.
- 55 Leeuw M, Goossens ME, Linton SJ, Crombez G, Boersma K, Vlaeyen JW. The fear-avoidance model of musculoskeletal pain: Current state of scientific evidence. *J Behav Med* 2007;30:77–94.
- 56 Gordon AS, Panahian-Jand M, McComb F, Melegari C, Sharp S. Characteristics of women with vulvar pain disorders: Responses to a web-based survey. *J Sex Marital Ther* 2003;29(1):45–58.
- 57 Bergeron S, Rosen NO, Morin M. Genital pain in women: Beyond interference with intercourse. *Pain* 2011;152:1223–5.
- 58 Chartier KJ. Evaluating the relationship between women's sexual desire and satisfaction from a biopsychosocial perspective. Logan, UT: Utah State University; 2009.

- 59 Byers S, Demmons S, Lawrance K. The interpersonal exchange model of sexual satisfaction. *Pers J Soc Relat* 1998;15:257–67.
- 60 Fordyce W, Fowler R Jr, Lehmann J, Delateur B, Sand P, Trieschmann R. Operant conditioning in the treatment of chronic pain. *Arch Phys Med Rehabil* 1973;54(9):399.
- 61 Gullledge AK, Gullledge MH, Stahmann RF. Romantic physical affection types and relationship satisfaction. *Am J Fam Ther* 2003;31:233–42.
- 62 Long EC, Cate RM, Fehsenfeld DA, Williams KM. A longitudinal assessment of a measure of premarital sexual conflict. *Fam Relat* 1996;45:302–8.
- 63 Jodoin M, Bergeron S, Khalifé S, Dupuis MJ, Desrochers G, Leclerc B. Male partners of women with provoked vestibulodynia: Attributions for pain and their implications for dyadic adjustment, sexual satisfaction, and psychological distress. *J Sex Med* 2008;5(12):2862–70.