SEXUAL COMMUNICATION IN COUPLES COPING WITH PROVOKED VESTIBULODYNIA: ASSOCIATIONS WITH BIOPSYCHOSOCIAL OUTCOMES AND TRAJECTORIES OF CHANGE WITH INTERVENTION

by

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My affection for communication comes from learning how to do it with you.
This dissertation is dedicated to my love, Logan.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Provoked vestibulodynia (PVD) – a recurrent vulvovaginal pain condition – has physical, psychological, sexual, and relational consequences for affected women and their partners. The pain is often provoked during partnered sexual activity, emphasizing the need to integrate dyadic perspectives into PVD research. Sexual communication is a relevant interpersonal construct for these couples, and is associated with sexual well-being in community and clinical samples. However, couples' coping with vulvovaginal pain experience difficulties with sexual communication, supporting the necessity of better understanding this interpersonal factor in PVD. This dissertation aimed to examine the associations between sexual communication and couples' adjustment to PVD, and the trajectory of change in women's and partners' sexual communication over the course of cognitive-behavioural couple therapy (CBCT) for PVD. Three studies were conducted with couples where the affected woman was diagnosed with PVD. Study 1 was a cross-sectional investigation of the associations between women's and partners' (N = 107 couples) perceptions of their dyadic sexual communication (DSC) and women's pain intensity during intercourse, and women's and partners' sexual satisfaction, sexual functioning, and depressive symptoms. Overall, greater DSC was associated with higher sexual satisfaction and function, and lower depressive symptoms for both women and partners, as well as women's lower pain. Study 2 was a cross-sectional examination of the associations between women's and partners' (N = 87 couples) perceptions of their collaborative and negative sexual communication patterns (CSCP and NSCP) and women's pain intensity, and women's and partners' sexual functioning, sexual satisfaction, sexual distress, and relationship satisfaction. Overall, CSCP were associated with more favourable sexual and relational outcomes, whereas NSCP were associated with poorer sexual and relational outcomes, for both women and partners. Study 3 compared the change trajectories of CSCP and NSCP for women and partners (N = 84 couples) randomized to CBCT (N = 41) or lidocaine intervention (N = 43). Improvements in CSCP were greater for couples receiving CBCT than lidocaine; findings were less clear for NSCP. Importantly, sexual communication is associated with multiple aspects of couples' adjustment to this distressing pain condition, and demonstrates promise as a potential mediator or mechanism of change in CBCT for PVD.

LIST OF ABBREVIATIONS AND SYMBOLS USED

APIM	Actor-Partner Interdependence Model
b	Unstandardized beta coefficient
BDI	Beck Depression Inventory
CBT	Cognitive-Behavioural Therapy
CBCT	Cognitive-Behavioural Couple Therapy
CSCP	Collaborative Sexual Communication Patterns
CSI	Couples Satisfaction Index
df	Degrees of freedom
DSC	Dyadic Sexual Communication
e	Error term (unexplained variance)
F	F-test from MANOVA
FSDS-R	Female Sexual Distress Scale - Revised
FSFI	Female Sexual Function Index
GMSEX	Global Measure of Sexual Satisfaction
GPPPD	Genito-Pelvic Pain/Penetration Disorder
IBCT	Integrative Behavioural Couple Therapy
ICC	Intraclass correlation coefficient
IIEF	International Index of Erectile Function
M	Mean
MANOVA	Multivariate analysis of variance
MCAR	Missing completely at random
N	Population sample size
n	Sample size
NRS	Numerical rating scale
NSCP	Negative Sexual Communication Patterns
p	P-value for significance testing
PVD	Provoked Vestibulodynia
r	Pearson product-moment correlation coefficient
SCP	Sexual Communication Patterns
S-CPQ	Sexual Communication Patterns Questionnaire
SE	Standard error
SD	Standard deviation
t	t-value for t-tests
T	Timepoint
TBCT	Traditional Behavioural Couple Therapy
α	Chronbach's alpha (measure of internal consistency)
χ^2	Chi-square value
Wilk's λ	Probability distribution used in MANOVA

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CHAPTER 1: INTRODUCTION

For most people, sexuality is a fundamental aspect of health and well-being, whether this is driven by one's personal values, values negotiated by the romantic relationship, or both. Unfortunately, few experiences will interfere more with the development and/or maintenance of a healthy individual and couple sexuality than situations that challenge the meaning, form, and function of sex, such as genito-pelvic pain. As William H. Masters, preeminent sex researcher, said, "When things don't work well in the bedroom, they don't work well in the living room, either." The ramifications of genito-pelvic pain are seldom confined to sexual activity, and often seep into other domains of well-being for the woman, her partner, and their relationship. Thus, understanding and intervening upon factors that might help or hinder couples' adjustment to this condition – such as their sexual communication – is essential to promoting their overall well-being.

1.1 Review of Provoked Vestibulodynia

1.1.1 Defining provoked vestibulodynia

'Genito-pelvic pain/penetration disorder' (*GPPPD*) is a female sexual dysfunction involving recurrent difficulties with pain during sexual intercourse, fears of painful penetration, and significant psychological distress (DSM-5; APA, 2013). The most common cause of GPPPD is '*vulvodynia*', which is defined as idiopathic vulvar pain that has persisted for a minimum of three months, according to a recent consensus statement on the classification of vulvar pain (Bornstein et al., 2016). Population-based estimates indicate that the lifetime prevalence of vulvar pain symptoms consistent with a diagnosis of vulvodynia is between 8% and 16% of women of childbearing age (Harlow

et al., 2014; Harlow, Wise, & Stewart, 2001; B. D. Reed, Harlow, Sen, Legocki, et al., 2012).

The classification consensus statement includes four pain-based descriptors that allow for the specification of vulvodynia subtypes on the basis of pain location (i.e., localized, generalized, or mixed), contexts that trigger pain (i.e., with provocation/contact, spontaneous, or mixed), onset (i.e., primary/lifelong or secondary/acquired), and temporal pattern (e.g., persistent, intermittent, constant, immediate, and delayed; (Bornstein et al., 2016). The most common subtype of vulvodynia, '*provoked vestibulodynia (PVD)*', refers to pain that is elicited when pressure is applied to the vulvar vestibule, which is the area of sensitive tissue surrounding the urethra and the vaginal entrance (Harlow et al., 2001). Although women with PVD may experience pain from non-sexual activities (e.g., tampon insertion, gynecological examinations), the pain is most commonly provoked during partnered sexual activities, particularly those involving vaginal penetration (e.g., painful sexual intercourse, or *'dyspareunia'*). Women with PVD commonly describe the pain as having an incisive (e.g., sharp, cutting, knifelike) or thermal (e.g., searing, burning) quality (Bergeron, Binik, Khalife, Pagidas, & Glazer, 2001). PVD may be either primary, meaning that it has occurred since the woman's first experience of vaginal penetration, or secondary, meaning that it was acquired after a period of no vulvar pain.

1.1.2 Etiology of vulvodynia

Expert reviews of the etiological literature on vulvodynia conclude that the condition is likely not attributable to a single disease process, but rather, a complex interplay of factors that influence the onset and/or maintenance of the disorder (Bornstein

et al., 2016; Pukall et al., 2016). Several pathophysiological processes appear to contribute to the development and/or persistence of vulvodynia, including hormonal changes due to the use of combined hormonal contraceptives, central and peripheral neurological changes (e.g., central sensitization, increased nociceptor innervation of the vulvar vestibule), repeated yeast or bladder infections and resulting inflammatory responses, dysfunction of the pelvic floor musculature, and genetic factors (e.g., polymorphisms that influence susceptibility to infection, inflammatory responses, or hormonal changes with hormonal contraception) (Bergeron, Corsini-Munt, Aerts, Rancourt, & Rosen, 2015; Bornstein et al., 2016; Pukall et al., 2016).

In addition to physiological factors, there is growing evidence that psychosocial factors may be a risk factor for vulvodynia. Retrospective reports suggest that severe childhood maltreatment may increase the risk of developing vulvodynia: in two studies, women who experienced severe childhood physical or sexual abuse were 3 to 6 times more likely to report symptoms consistent with vulvodynia (Harlow & Stewart, 2005; Khandker, Brady, Stewart, & Harlow, 2014). Psychological factors may also contribute to the development and maintenance of vulvodynia: two retrospective studies found that women with vulvodynia were 4 to 6 times more likely to have an antecedent anxiety and/or mood disorder than controls (Khandker et al., 2014; Khandker et al., 2011).

A handful of studies have also examined the role of psychological variables, such as cognitive predictors from the fear-avoidance model of chronic pain (Vlaeyen, Crombez, & Linton, 2016), in the *persistence* of women's pain. Controlled studies have shown that women with PVD are more likely to exhibit greater fear of pain, catastrophic thinking about pain, and hypervigilance to pain stimuli (Payne, Binik, Amsel, & Khalife,

2005; Payne et al., 2007). Together, higher levels of hypervigilance, catastrophizing, and fear of pain, and lower levels of pain self-efficacy, have been associated with women's greater pain intensity, though only pain catastrophizing contributed unique variance to women's pain in this study (Desrochers, Bergeron, Khalife, Dupuis, & Jodoin, 2009).

1.1.3 Consequences and associated difficulties of vulvodynia

In addition to vulvovaginal pain, women with vulvodynia experience associated difficulties across several domains of well-being, including physical, psychological, sexual, and relational. Women with vulvodynia are two to three times more likely than unaffected women to have at least one comorbid pain condition (e.g., interstitial cystitis, irritable bowel syndrome, fibromyalgia, or orofacial pain) (Arnold, Bachmann, Rosen, Kelly, & Rhoads, 2006; Bair et al., 2015; B. D. Reed, Harlow, Sen, Edwards, et al., 2012). They are also more likely to experience psychological comorbidities – namely, symptoms of depression and anxiety – than women without pain (Arnold, Bachmann, Rosen, & Rhoads, 2007; Granot & Lavee, 2005; Iglesias-Rios, Harlow, & Reed, 2015; Landry & Bergeron, 2011; Masheb, Wang, Lozano, & Kerns, 2005; Nylanderlundqvist & Bergdahl, 2003; Payne et al., 2005; Pazmany, Bergeron, Verhaeghe, Van Oudenhove, & Enzlin, 2014; Wylie, Hallam-Jones, & Harrington, 2009). Khandker et al. (2011) suggested that the association between vulvodynia and affective disorders may be bidirectional, as anxiety and mood disorders were both antecedent and consequent to the onset of vulvodynia symptoms in their sample. However, other authors have found no association between vulvodynia and mood and anxiety symptoms (Aikens, Reed, Gorenflo, & Haefner, 2003; Desrosiers et al., 2008; Meana, Binik, Khalife, & Cohen,

1997; Payne et al., 2007), indicating that there is likely great variability in the psychological well-being of women affected by vulvodynia.

Given that women with PVD most commonly experience pain in a sexual context, it is possible that women's emotional distress centers primarily on their sexuality. Controlled studies indicate that women experiencing pain during intercourse report significantly higher and/or clinically relevant levels of sexual distress (i.e., negative feelings and cognitions concerning one's sexuality; Basson et al. (2000)) (Brauer, ter Kuile, Laan, & Trimbos, 2009; Pazmany et al., 2014).

In addition to the increase in negative affective experiences, women with PVD are also prone to experiencing a reduction in the positive aspects of their sexuality – namely, their sexual satisfaction (i.e., the overall subjective evaluation of the quality of their sex life; (Holmberg & Blair, 2009) and their sexual functioning (i.e., the psychological and physiological processes involved their sexual response; (Basson et al., 2000). Controlled studies of women with vulvodynia or PVD consistently indicate that they report lower sexual satisfaction than women without vulvovaginal pain (Hallam-Jones, Wylie, Osborne-Cribb, Harrington, & Walters, 2001; Pazmany et al., 2014; N. O. Rosen, Santos-Iglesias, & Byers, 2016; Smith & Pukall, 2011; Smith, Pukall, & Chamberlain, 2013). More specifically, women with PVD report fewer sexual rewards (i.e., positive or pleasurable sexual exchanges), more sexual costs (i.e., negative sexual exchanges), and a more unfavourable ratio of sexual rewards to costs, than unaffected women (N. O. Rosen, Santos-Iglesias, et al., 2016). Women with vulvodynia have also been shown to experience reductions in every domain of sexual functioning relative to women without pain (Brauer et al., 2009; Meana et al., 1997; Pazmany et al., 2014; Smith

et al., 2013), though this is not always the case (Desrosiers et al., 2008). Studies show that women experiencing painful intercourse, vulvodynia, or PVD report lower frequencies of intercourse (Meana et al., 1997), lower levels of sexual desire, arousal, and lubrication (Meana et al., 1997; Pazmany et al., 2014; Smith et al., 2013), as well as difficulties achieving orgasm (Meana et al., 1997; Smith et al., 2013).

Finally, mixed evidence also points to the potential impact of PVD on women's broader relationship adjustment or satisfaction. Most quantitative studies demonstrate that women with PVD or pain during intercourse are as relationally satisfied as normative samples or their pain-free counterparts (Desrosiers et al., 2008; Pazmany et al., 2014; Smith & Pukall, 2011; Smith et al., 2013). However, the qualitative literature emphasizes the relational strain that women can experience as a result of this condition: women with vulvodynia report feelings of guilt, shame, and inadequacy as relational and sexual partners (Ayling & Ussher, 2008), fears of losing their partner (Sheppard, Hallam-Jones, & Wylie, 2008), and avoidance of affection due to fear that intimate behaviours will result in pain (Hinchliff, Gott, & Wylie, 2012). Thus, there does appear to be an impact of PVD on aspects of women's relationship quality.

1.1.4 The integration of a dyadic perspective in PVD research

In the last decade, researchers have increasingly integrated the romantic partner into PVD research. The health research field has seen a growth in theoretical and empirical studies highlighting the interpersonal components of adjustment to chronic health conditions, such as cancer and pain (Leonard, Cano, & Johansen, 2006; Manne & Badr, 2008). For example, the Developmental-Contextual Model proposes that because chronic conditions affect both the patient and their romantic partner, researchers and

clinicians must consider how both members of the couple cope in relation to one another by considering both the patient's and partner's involvement in evaluations of health/illness appraisal, coping, and adjustment (Berg & Upchurch, 2007).

Human sexuality research has seen similar calls for greater integration of dyadic conceptualizations of sexuality into models of sexual function and dysfunction (Dewitte, 2014). Of relevance to PVD, Dewitte argues that most definitions of sexual dysfunction identify one person as the "patient" (i.e., the person directly experiencing the sexual problem), even though sexual challenges most commonly exist within the dynamic interactions *between* individuals. Thus, dyadic methodologies also offer the potential of a more nuanced understanding of relational processes in sexual health contexts.

Increasingly, researchers are shifting the conceptualization of PVD by emphasizing that this pain condition is typically experienced within an intimate context; as such, the sexual and romantic partner is a witness, can even trigger the pain during sexual activity, and suffers consequences alongside the woman. The partner's experience was recently explored in a qualitative study involving 16 male partners of women with PVD; partners explained how PVD negatively impacted multiple domains of their well-being, including their emotional responding (e.g., either through increased inhibiting or activating emotions), sexual health (e.g., sexual distress, reduced physical intimacy, feelings of inadequacy as a sexual partner), and relational adjustment (e.g., relational strain, difficulties with communication) (Sadownik, Smith, Hui, & Brotto, 2016).

The majority of controlled studies lend support to these qualitative findings (for review, see N. O. Rosen, Rancourt, Corsini-Munt, and Bergeron (2014), although some have found no indication of psychological, sexual, and relational difficulties in male

partners of women with PVD (Desrosiers et al., 2008). Nylanderlundqvist and Bergdahl (2003) found that male partners of women with PVD reported greater depressive symptoms than control partners. Compared to partners of pain-free women, male partners of women with PVD or pain during intercourse are also more likely to report poorer erectile function (Pazmany et al., 2014; Smith & Pukall, 2014), and lower sexual satisfaction (Jodoin et al., 2008; Pazmany et al., 2014; N. O. Rosen, Santos-Iglesias, et al., 2016; Smith & Pukall, 2011, 2014). Although partners report no differences in their overall relationship adjustment using self-report measures (Smith & Pukall, 2011, 2014), they do experience greater relational concerns than control partners, such as less affectional expression and a greater discrepancy between their perception of a "satisfying relationship" and their actual relationship (Smith & Pukall, 2014).

Due to the interpersonal context of the pain, researchers have also evaluated how interpersonal factors can influence women's pain, and women and partners' psychosexual outcomes (N. O. Rosen, Rancourt, et al., 2014). Dyadic analytic approaches have been particularly relevant to research on interpersonal factors in PVD because they allow for the study of cross-effects between women and partners, such as the influence of partner variables on women's outcomes, or vice versa.

Communication between women and partners is an overarching aspect of the investigation of interpersonal factors in PVD. For example, the most widely-studied interpersonal factor to date is partner's verbal and non-verbal responses to women's pain during intercourse. Through multiple cross-sectional and daily diary studies, Rosen and colleagues have demonstrated that: (1) partners' greater facilitative responses (i.e., those encouraging adaptive approaches to pain coping) are associated with women's reduced

pain, higher relationship and sexual satisfaction, and greater sexual function (N. O. Rosen, S. Bergeron, M. Glowacka, I. Delisle, & M. L. Baxter, 2012; N. O. Rosen, Bergeron, Sadikaj, & Delisle, 2015; N. O. Rosen, Bergeron, Sadikaj, Glowacka, Delisle, et al., 2014; N. O. Rosen, Muise, Bergeron, Delisle, & Baxter, 2015); (2) partners' greater solicitous responses (i.e., those that express sympathy or focus on the pain) are associated with women's greater pain, and both partners' reduced sexual function and satisfaction (N. O. Rosen et al., 2012; N. O. Rosen, Bergeron, et al., 2015; N. O. Rosen, Bergeron, Sadikaj, Glowacka, Delisle, et al., 2014); (3) partners' greater negative responses (i.e., those that express hostility or criticism) are associated with women's greater pain, depressive symptoms, and relationship distress, and reduced sexual function and satisfaction for both members of the couple (N. O. Rosen, Bergeron, et al., 2015; N. O. Rosen, Bergeron, Sadikaj, Glowacka, Baxter, et al., 2014; N. O. Rosen, Bergeron, Sadikaj, Glowacka, Delisle, et al., 2014; N. O. Rosen, Muise, Bergeron, Delisle, et al., 2015). A host of other relational factors (e.g., perceived and observed intimacy, attachment style) have been linked to couples' adjustment to PVD, highlighting the importance of relational dynamics – such as communication – in couples' biopsychosocial adjustment to the condition (N. O. Rosen, Rancourt, et al., 2014). Given that sexuality is a core issue for couples experiencing PVD, presumably, their communication as a couple *about* sexuality will influence their well-being. In particular, couples' approaches to sexual communication may play a meaningful role in determining how effectively they navigate the sexual problems that they are experiencing (e.g., sexual distress, sexual dissatisfaction, sexual functioning issues).

1.2 Review of Sexual Communication

1.2.1 Defining sexual communication

"Sexual communication" refers to the discussion of sexual matters with a sexual partner (Babin, 2013), and as such, may be considered from either an individual or a dyadic perspective. Given the interpersonal context of PVD, the present thesis focuses on dyadic definitions of sexual communication, which are important to differentiate from more intrapersonal sexual communication constructs. Dyadic definitions of sexual communication emphasize that sexual communication is an interpersonal *process*, and are more likely to consider the dynamic aspects of sexual communication between two members of a couple. Dyadic sexual communication refers to an individual's perception of how openly and effectively they and their partner communicate *as a couple* about sexual matters (Catania, 2011). Communication patterns, as applied to sexual communication, refer more specifically to the affective and behavioural patterns displayed by couples around difficulties in their sexual relationship (e.g., expressing criticism or appreciation, engaging or withdrawing) (Crenshaw, Christensen, Baucom, Epstein, & Baucom, in press).

In contrast to dyadic conceptualizations of sexual communication, several related sexual communication constructs emphasize the intrapersonal processes involved in sexual communication. Sexual assertiveness refers to an individual's willingness and ability to talk about sex, initiate sexual activity, refuse unwanted sex, and negotiate sexual behaviours based on his or her preferences (Greene & Faulkner, 2005; Morokoff et al., 1997). Sexual self-disclosure refers more specifically to the extent to which a person is willing to be open about themselves with their sexual partner, and typically

focuses on disclosure of sexual preferences (Montesi, Fauber, Gordon, & Heimberg, 2011; Rehman, Rellini, & Fallis, 2011). Conversely, sexual communication apprehension refers to anxiety or fear about discussing sexual topics with one's partner, and is associated with reduced sexual communication behaviours (e.g., expression of sexual pleasure (Babin, 2013)). Much of the empirical literature, as will be reviewed below, has focused on these intrapersonal sexual communication constructs as opposed to more dyadically-focused measurements of sexual communication.

1.2.2 Sexual communication in community samples

Sex researchers and therapists generally consider sexual communication to be crucial to "the development and maintenance of satisfying sexual relationships" (MacNeil & Byers, 2005). One widely-recognized theory of sexual communication – hereto referred to as the Two Pathways Model (Cupach & Metts, 1991; MacNeil & Byers, 2005) – proposes two pathways by which sexual self-disclosure – a facet of sexual communication – contributes to greater sexual satisfaction. By the instrumental pathway, sexual self-disclosure is thought to facilitate couples' improved understanding of their partners' sexual preferences, thereby allowing the couple to modify their sexual behaviours and directly improve their sexual satisfaction. By the expressive pathway, through the sharing of highly intimate topics, sexual self-disclosure is believed to contribute to greater intimacy, which is thought to also lead to greater sexual satisfaction.

The Two Pathways Model has received empirical support in a community sample of men and women in long-term relationships. Through the instrumental pathway, MacNeil and Byers (2009) found that men's and women's greater sexual self-disclosure predicted their partner's greater understanding of behaviours that they viewed as sexually

pleasing, which in turn predicted the individuals' sexual satisfaction. Through the expressive pathway, men's sexual self-disclosure contributed to their sexual satisfaction through their relationship satisfaction; however, amongst women, only non-sexual disclosures contributed to women's greater relationship and sexual satisfaction (MacNeil & Byers, 2009).

Several other studies support the proposition that sexual communication contributes to more satisfying sexual relationships. In community samples of men and women in dating or committed relationships, greater sexual communication (e.g., sexual self-disclosure, sexual assertiveness) has been associated with greater sexual satisfaction (MacNeil & Byers, 2005; Mark & Jozkowski, 2013; Montesi et al., 2011; Rehman, Rellini, et al., 2011; Timm & Keiley, 2011), greater sexual function (Hurlbert, 1991; Rehman, Rellini, et al., 2011), lower sexual distress (Hayes et al., 2008), and greater relationship satisfaction (Coffelt & Hess, 2014; Greene & Faulkner, 2005; Montesi et al., 2011). Yet while sexual communication appears to benefit couples, it is not uncommon for couples to experience difficulties in communicating about sex (Rehman, Janssen, et al., 2011; Sanford, 2003; Williamson, Hanna, Lavner, Bradbury, & Karney, 2013). In an observational study of couples' discussions of nonsexual and sexual relationship problems, women rated sexual topics as more important, but also more difficult, to discuss than nonsexual relationship topics (Rehman, Janssen, et al., 2011). Likewise, studies have found that sexual self-disclosure among couples in committed relationships occurs rarely (i.e., mean scores of sexual self-disclosure equating to 'rarely' to 'sometimes' on the measurement scale) (Coffelt & Hess, 2014), and that when it does occur, couples are more likely to discuss positive aspects of their sexuality (e.g., sexual

likes) than negative ones (e.g., negative affect, sexual dislikes) (Coffelt & Hess, 2014; MacNeil & Byers, 2009).

Studies in community samples have shown that inhibited sexual communication may have negative repercussions for men's and women's sexual well-being. Perceiving sexual communication as threatening, or experiencing apprehension around sexual communication, has been associated with individuals' avoidance of sexual topics (Theiss & Estlein, 2014), or their use of indirect forms of sexual communication (Babin, 2013; Theiss & Estlein, 2014). In turn, indirect or inhibited sexual communication is associated with individuals' lower sexual and relationship satisfaction (Babin, 2013; D. Davis et al., 2006; Theiss, 2011; Theiss & Estlein, 2014). For example, Coffelt and Hess (2014) found that a lower frequency of sexual self-disclosure was associated with individuals' lower relationship satisfaction, irrespective of gender. Thus, it appears that difficulties with sexual communication are common, particularly concerning negatively-charged sexual topics, and that having a hard time with sexual communication may be detrimental to relational and sexual well-being.

1.2.3 Sexual communication and PVD

Given that sexual communication is perceived to be difficult and occurs with low frequencies among women and men in community samples (e.g., Coffelt & Hess, 2014; Rehman, Janssen, et al., 2011), it might be expected that women and men experiencing problems in the sexual relationship – as is the case with PVD – are even more likely to experience inhibited sexual communication than community samples. Both uncontrolled and controlled studies of women with vulvovaginal pain suggest that this is the case: uncontrolled studies show that between 1/3 to 1/2 of women with vulvovaginal pain

report either poor sexual communication or discomfort in discussing sex with their partners (Jelovsek, Walters, & Barber, 2008; Schover, Youngs, & Cannata, 1992), and controlled studies indicate that both women experiencing painful intercourse and their partners report lower dyadic sexual communication than couples who are unaffected by vulvovaginal pain (Pazmany, Bergeron, Verhaeghe, Van Oudenhove, & Enzlin, 2015; Smith & Pukall, 2014).

Studies of couples coping with PVD have demonstrated that constructs either related to, or subsumed within sexual communication are associated with couples' sexual, relational, and psychological outcomes. Leclerc et al. (2015) demonstrated that greater sexual assertiveness in women with PVD and their male partners was associated with individuals' own higher sexual functioning; additionally, women's higher sexual assertiveness was associated with their own and their partners' higher sexual satisfaction. In a series of cross-sectional self-report and observational studies, Bois and colleagues demonstrated that couples' greater intimate disclosures and empathic responding were associated with women's and partners' greater sexual satisfaction, greater sexual functioning, greater relationship adjustment, and lower sexual distress in response to PVD (Bois et al., 2016; Bois, Bergeron, Rosen, McDuff, & Gregoire, 2013; N. O. Rosen, Bois, Mayrand, Vannier, & Bergeron, 2016). Only one study in a sample of couples coping with painful intercourse has examined the associations between dyadic sexual communication and women's and partners' adjustment. Pazmany et al. (2015) found that women's greater dyadic sexual communication was associated with their own greater sexual function, lower sexual distress, and higher relationship adjustment. Moreover, male partners' greater dyadic sexual communication was associated with their own

higher relationship adjustment. However, women's and partners' dyadic sexual communication was not associated with their partners' outcomes in this study.

The Two Pathways Model of sexual communication may be relevant to many outcomes beyond sexual satisfaction in PVD samples. In couples coping with PVD, open and effective sexual communication may allow couples to better understand the physical and emotional challenges each member of the couple experiences around their sexuality, thereby allowing them to build emotional intimacy (i.e., the expressive pathway) and enact behavioural changes (i.e., the instrumental pathway). Emotional intimacy and behavioural activities are related to many aspects of individuals' and couples' well-being in coping with various problems, such as depressive disorders (e.g., Finkbeiner, Epstein, & Falconier, 2013), chronic pain (e.g., Leong, Cano, & Johansen, 2011), and relational distress (Osgarby & Halford, 2013; Sevier, Atkins, Doss, & Christensen, 2015). As such, enhancing emotional intimacy and behaviour change through sexual communication may benefit many aspects of couples' adjustment to PVD beyond their sexual well-being, such as their relational, psychological, and physical adjustment to the pain.

1.2.4 Limitations and opportunities for the study of sexual communication in PVD

Although PVD researchers have studied several interpersonal factors that relate to sexual communication, few have explicitly examined associations between dyadic conceptualizations of sexual communication and couples' outcomes. This is a key limitation to the existing literature given that dyadic models of chronic pain and sexuality, as well as the Two Pathways Model, suggest that couples' communication may be an important tool for couples experiencing problems in these areas, as is the case in PVD (Dewitte, 2014; Leonard et al., 2006; MacNeil & Byers, 2009). Pazmany et al.

(2015) examined cross-sectional associations between dyadic sexual communication and women's and partners sexual and relational outcomes in a sample of women experiencing painful intercourse. However, given their small sample size, the heterogeneity of women's pain experiences, and that they only examined a subset of biopsychosocial outcomes relevant to couples coping with painful intercourse, further replication of their findings in a PVD sample is warranted. In particular, these sample-related limitations may explain the absence of partner effects in their study.

The reviewed literature suggests that aspects of sexual communication are associated with positive outcomes in couples affected by PVD. However, the process of that sexual communication has seldom been considered. In one of the few studies to examine the behaviours expressed during couples' sexual discussions, Rehman, Janssen, et al. (2011) demonstrated that the presence of negative behaviours (i.e., contempt, belligerence, defense, anger, dominance) was associated with women's lower relationship satisfaction in a community sample of couples. These findings illustrate the importance of studying how couples' communication behaviours and interactional patterns around sexual topics may influence their well-being. With respect to couples' coping with PVD, the measurement of dyadic sexual communication offers a first step in understanding sexual communication as a process because it reflects individuals' perceptions of the quality of their sexual communication with their partner. However, specifically considering couples' sexual communication patterns offers the ability to further refine our understanding by asking questions like: "Do certain patterns of communication contribute to better outcomes than others?" and "can we directly target and change patterns of sexual communication in couples' coping with PVD?"

The relationship communication literature demonstrates that the "how" of communication, particularly concerning problem areas (e.g., areas of disagreement and discord), is pivotal to understanding the impact of communication on couples' outcomes. Several studies demonstrate that the presence of communication is not always positive for couples' relationship outcomes; rather, the relational impact of couple communication depends on the communication patterns displayed (Christensen & Shenk, 1991; Gill, Christensen, & Fincham, 1999; Holman & Jarvis, 2003; Litzinger & Gordon, 2005; Schrodt, Witt, & Shimkowski, 2013). Communication patterns may be categorized based on their valence (i.e., the range of positive to negative affective expressions displayed during conflict discussions) (Crenshaw et al., in press; Woodin, 2011). Meta-analytic findings demonstrate that negatively-valenced communication patterns (i.e., hostility, distress, withdrawal) are associated with poorer relationship adjustment, whereas positively-valenced patterns (i.e., intimacy, problem-solving) are associated with greater relationship adjustment (Woodin, 2011).

For many couples coping with PVD, problem areas tend to be within the sexual domain. Moreover, women have rated sexuality as the most difficult relational conversation topic (Rehman, Janssen, et al., 2011), sexual dislikes and difficulties are disclosed less often than sexual likes (Coffelt & Hess, 2014; MacNeil & Byers, 2009), and couples' experiencing painful intercourse report poorer sexual communication than unaffected couples (e.g., Pazmany et al., 2014). Therefore, studying couples' communication patterns concerning sexual difficulties is an important extension to both the PVD and sexual communication literatures. Ultimately, understanding the impact of sexual communication patterns (SCP) on couples' well-being may point researchers in

the direction of identifying more precise treatment targets in psychosocial interventions for PVD.

1.3 Sexual Communication and Treatment in Couples Coping with PVD

1.3.1. The pathway to diagnosis and treatment

Despite the high prevalence of vulvodynia among women of child-bearing age, vulvodynia remains an underdiagnosed and undertreated condition. Many women with vulvodynia report feelings of invalidation and isolation (Nguyen, Ecklund, Maclehose, Veasley, & Harlow, 2012), and women who seek care for the pain are more likely to perceive a high degree of stereotyping by health care professionals than women who never seek care (Nguyen, Turner, Rydell, Maclehose, & Harlow, 2013). Current reports suggest that 50% to 60% of women with vulvodynia-like symptoms will consult a health professional for their pain (Harlow & Stewart, 2003; Nguyen et al., 2012; B. D. Reed, Harlow, Sen, Legocki, et al., 2012), and those who do will visit anywhere from three to nine health care providers for diagnosis and/or treatment (Arnold et al., 2006; Harlow & Stewart, 2003; Nguyen et al., 2012). Moreover, one study found that only 25% of women who sought care received a diagnosis for their pain, and vulvodynia was rarely the diagnosis provided (only 5.7% of women who received a diagnosis of any type, or 2% of women meeting symptom-criteria for the condition) (B. D. Reed, Harlow, Sen, Legocki, et al., 2012).

1.3.2 Evidence-based treatments for PVD

Evidence-based treatments for PVD include pelvic floor physiotherapy, medical/surgical approaches (e.g., topical application of steroids/creams, vestibulectomy), and psychological interventions (e.g., mindfulness, cognitive-

behavioural therapy) (Goldstein et al., 2016). The most commonly prescribed topical medical treatment for PVD is 5% lidocaine, an anesthetic ointment that is thought to inhibit the oversensitized peripheral nerves implicated in PVD (Zolnoun, Hartmann, & Steege, 2003). Zolnoun et al. (2003) found that the nightly application of 5% lidocaine to the vulvar vestibule for an average of seven weeks reduced women's self-reported pain during intercourse from pre- to post-treatment. Two randomized clinical trials (RCT) have evaluated the daily application of topical lidocaine. Danielsson, Torstensson, Brodda-Jansen, and Bohm-Starke (2006) found improvements in vulvar pain thresholds and sexual functioning for women receiving lidocaine or biofeedback interventions, with no significant differences between treatments at post-treatment and 12-months later. However, relative to a placebo-control, Foster et al. (2010) found no benefit to topical lidocaine treatment above the placebo effect: both conditions resulted in reduced pain as measured via pain upon insertion and removal of a tampon (Foster et al., 2010).

The most studied psychological intervention approach for the management of PVD is cognitive-behavioural therapy (CBT), although the application of mindfulness-based cognitive therapy is also gaining support (Brotto, Basson, Smith, Driscoll, & Sadownik, 2015; Dunkley & Brotto, 2016). Given the range of consequences and difficulties experienced by women with PVD, CBT for PVD uses a multifactorial approach, with goals of pain reduction and improvements in sexual function and satisfaction. To this end, researchers have adapted CBT protocols for chronic pain that utilize cognitive and behavioural strategies (e.g., psychoeducation, cognitive restructuring, relaxation and mindfulness, exposure and pacing) to the contexts relevant to women with PVD (e.g., sexual activity, gynecological examinations). CBT for PVD

also integrates sex therapy interventions that are commonly applied in cases of sexual dysfunction and/or sexual pain (e.g., sensate focus, dilatation) (Bergeron, Binik, Khalife, Pagidas, Glazer, et al., 2001).

Four clinical trials have evaluated CBT for vulvodynia (three specifically for women with PVD (Bergeron, Binik, Khalife, Pagidas, Glazer, et al., 2001; Bergeron, Khalife, Dupuis, & McDuff, 2016; Bergeron, Khalife, Glazer, & Binik, 2008; Masheb, Kerns, Lozano, Minkin, & Richman, 2009; ter Kuile & Weijenborg, 2006). In an open clinical trial using intent-to-treat analysis, ter Kuile and Weijenborg (2006) found that women with PVD reported significant reductions in pain during intercourse and in sexual dissatisfaction following a 12-session group CBT protocol. An RCT comparing 10-session individual CBT against individual supportive psychotherapy for 50 women with vulvodynia found that while both treatment conditions resulted in significant improvements in pain during intercourse, women in the CBT condition had greater improvements in sexual function, and greater treatment satisfaction, with these gains maintained one year following treatment (Masheb et al., 2009).

Two RCTs have compared group CBT against medical and behavioural approaches. In a first RCT, women with PVD were randomly assigned to receive group CBT, biofeedback, or surgical intervention (Bergeron, Binik, Khalife, Pagidas, Glazer, et al., 2001), whereas women in the second RCT received either group CBT or a topical steroid (Bergeron et al., 2016). In both RCTs, women in all treatment conditions experienced significant reductions in pain during intercourse over the six-month follow-up period. However, Bergeron et al. (2016) found that women receiving CBT reported greater pain reductions at six-months relative to the topical steroid group. Additionally,

although Bergeron, Binik, Khalife, Pagidas, Glazer, et al. (2001) found greater reductions in pain during intercourse at six-months for women receiving surgery than both CBT or biofeedback, 2.5 years later, the pain ratings of women in the CBT group were equivalent to the surgery group, and both of these interventions performed better over the long-term than biofeedback (Bergeron et al., 2008). Regarding sexual functioning, Bergeron, Binik, Khalife, Pagidas, Glazer, et al. (2001) found that women in all treatment conditions experienced improvements in sexual function that were maintained through the 2.5 year follow-up (Bergeron et al., 2008); in contrast, Bergeron et al. (2016) found that women receiving CBT reported greater improvements in sexual functioning at the six-month follow-up than women receiving the topical steroid. Thus, there is strong evidence that CBT for PVD leads to improvements in pain and sexual functioning that are maintained up to 2.5 years after treatment, and that these effects are equivalent to the most effective medical treatment approach for PVD – surgery – yet have a reduced risk profile.

Owing to the growing research evidence on the relational context in PVD, recently, researchers have integrated a dyadic focus into CBT interventions for this population. Corsini-Munt, Bergeron, Rosen, Mayrand, and Delisle (2014) adapted the content of Bergeron, Binik, Khalife, Pagidas, Glazer, et al. (2001) group CBT manual to create a 12-week, manualized Cognitive Behavioural Couple Therapy (CBCT) that incorporated the dyadic research literature and couple-focused interventions (e.g., communication skills training, identifying and addressing relational patterns of the couple). The results of their pilot study with eight couples demonstrated significant pre-post reductions in women's pain intensity during intercourse, as well as significant improvements in women's and partners' sexual satisfaction. Moreover, women

experienced significant pre-post gains in their sexual functioning, though this effect was non-significant for partners.

1.3.3 Sexual communication and psychological interventions for PVD

Given the increasing development and evaluation of empirically-supported interventions like CBT, clinical researchers have called for a greater emphasis on studying the processes involved in therapeutic change (Kazdin, 2007, 2009, 2016; Laurenceau, Hayes, & Feldman, 2007). These authors assert that process-focused questions, such as, "What changes occur over the course of treatment?" or, "How does change occur?", will allow researchers to refine and improve upon efficacious treatments. Examining the trajectory of change for a proposed mediator in two different treatment conditions – one involving manipulation of the proposed mediator, and one without such manipulation – is a key first step in generating empirical evidence for proposed mediators and mechanisms of treatment change (Kazdin, 2007; Laurenceau et al., 2007).

Couple therapy researchers also endorse the need for an expanded understanding of change processes in couple therapy (Jacobson & Addis, 1993; Johnson & Lebow, 2000), and a small body of research is beginning to accumulate in this area (Cordova, Jacobson, & Christensen, 1998; Doss, Rowe, Carhart, Madsen, & Georgia, 2011; Doss, Thum, Sevier, Atkins, & Christensen, 2005; Sevier et al., 2015; Sevier, Eldridge, Jones, Doss, & Christensen, 2008). However, to my knowledge, such research questions have never been undertaken in the context of couple-format sex therapy. While a few studies have evaluated psychotherapy change processes in individual or group-format sex therapy (Brotto, Chivers, Millman, & Albert, 2016; ter Kuile et al., 2007), it is likely that

systemic or dyadic processes – such as sexual communication – are particularly relevant mechanisms of therapeutic action in couple-based sex therapy.

Improving sexual communication may be an important component (e.g., a mediator or mechanism of change) of couple-format sex therapy for PVD. In their pilot study of CBCT for PVD, Corsini-Munt, Bergeron, Rosen, Mayrand, et al. (2014) found that couples viewed communication skills training – building sexual communication and emotional disclosure skills – as the most beneficial and favoured set of interventions. In the only study to examine changes in sexual communication through sex therapy, Tullman et al (1981) demonstrated that couples' communication improved following a two-week Masters and Johnson sex therapy program: women exhibited more assertive communication, and men demonstrated more self-disclosure, particularly of emotions they were not formerly expressing to their partners.

While not specific to sexual difficulties, changing communication processes is viewed as a core component of couple therapy, regardless of the therapeutic modality (Benson, McGinn, & Christensen, 2012; S. D. Davis, Lebow, & Sprenkle, 2012). In their unified protocol for couple therapy, Benson and colleagues (2012) stated that changing communication processes requires the reduction of "harmful" dynamics alongside an increase in "helpful" communication behaviours. Reducing harmful dynamics typically involves addressing both avoidance and negative approach behaviours (e.g., hostility) by helping couples to express avoided emotions (i.e., disclosure), and evaluate how negative communication behaviours impact their partner and relationship. In the context of a sexual dysfunction such as PVD, this might involve assisting couples to overcome the barriers that contribute to inhibited sexual communication (e.g., shame, guilt, fear), and

exploring how the avoidance of sexual communication or the expression of negative affect (e.g., criticism, denial) impacts their sex life and relationship. Increasing helpful dynamics usually involves coaching and modelling to help couples increase their capacity to disclose emotional topics as well as to respond effectively (e.g., active listening, expressing empathic concern).

1.4 Outline of dissertation papers

The overall objectives of my dissertation were twofold: first, I sought to examine the associations between couples' sexual communication and their biopsychosocial adjustment to PVD to understand whether sexual communication was a suitable psychological treatment target; second, I sought to examine whether sexual communication changed over the course of CBCT for PVD. To accomplish these objectives, I conducted two dyadic, cross-sectional studies examining key associations between two sexual communication constructs (dyadic sexual communication and sexual communication patterns) and pain, sexual, relational, and psychological outcomes in couples coping with PVD. I conducted a third study comparing the trajectory of change in couples' sexual communication patterns over the course of CBCT to a medical treatment condition (lidocaine). These three studies are presented as separate chapters within my dissertation (Chapters 2-4). Chapter 5 provides an overall discussion of the results, the strengths and limitations of these studies, recommendations for future research, and the application of the findings to clinical settings.

1.4.1 Aims and hypotheses of Chapter 2

My first study, as described in Chapter 2, was a cross-sectional investigation of the associations between dyadic sexual communication (DSC) and couples' pain-related,

sexual, and psychological adjustment in PVD. Given limitations to the only study that has examined associations between sexual communication and outcomes in a sample of couples coping with pain during intercourse (e.g., small sample size, heterogeneous sample, restricted outcomes; (Pazmany et al., 2015), my first study involved replicating the pattern of their findings in a larger, more homogeneous sample of couples coping with PVD, and extending to other important outcomes in couples coping with PVD (i.e., psychological well-being and sexual satisfaction). This study employed a cross-sectional dyadic design, including a self-report measure of DSC completed by women and partners, and an analytic approach that accounted for both members of the couple. Based on the existing theoretical and empirical literature in PVD and community samples (MacNeil & Byers, 2009; Pazmany et al., 2015; Rehman, Rellini, et al., 2011), I expected that women's and partners' greater DSC would be associated with their own, as well as their partners', greater sexual satisfaction and greater sexual functioning. Based on empirical literature on interpersonal factors in PVD (N. O. Rosen, Rancourt, et al., 2014), I also expected that women's and partners' greater DSC would be associated with women's lower pain intensity during intercourse, and individuals' own, and their partners', lower depressive symptoms.

1.4.2 Aims and hypotheses of Chapter 4

My second study, as described in Chapter 4, was a cross-sectional investigation of the associations between couples' sexual communication patterns (SCP) and their pain-related, sexual, and relational adjustment in PVD. This study extended the examination of sexual communication in women with PVD and their partners by examining their SCP, or the collaborative and negative communication behaviours and sequences of interaction

that couples reported regarding their sexual problems. This study employed a similar design as study one. Based on the existing literature on sexual communication and conflict communication (Pazmany et al., 2015; Rancourt, Rosen, Bergeron, & Nealis, 2016; Woodin, 2011), I expected that women's and partners' greater collaborative SCP and lower negative SCP would be associated with their own, as well as their partners', greater sexual and relationship satisfaction, and lower sexual distress. I also expected that women's and partners' greater collaborative and lower negative SCP would be associated with women's lower pain intensity during intercourse, and individuals' own, and their partners', greater sexual functioning.

1.4.3 Aims and hypotheses of Chapter 5

My third study, as described in Chapter 5, was a longitudinal investigation of the trajectory of change in women's and partners' collaborative and negative SCP over the course of two interventions for PVD: CBCT and lidocaine. This study examined whether women's and partners' collaborative SCP increased, and their negative SCP decreased, over the course of CBCT for PVD by comparing change trajectories against couples' receiving lidocaine intervention, where no changes in SCP were expected to occur. This study included five measurements of collaborative and negative SCP over the course of the 12-week intervention protocols. I hypothesized that women with PVD and their partners would show increases in collaborative SCP and decreases in negative SCP in the CBCT condition, whereas changes in SCP would be non-significant in the lidocaine condition. Moreover, I expected that treatment condition would moderate these change trajectories such that women with PVD and their partners would show greater increases

in collaborative SCP and greater decreases in negative SCP in the CBCT condition than in the lidocaine condition.

CHAPTER 2: TALKING ABOUT SEX WHEN SEX IS PAINFUL: DYADIC SEXUAL COMMUNICATION IS ASSOCIATED WITH WOMEN'S PAIN, AND COUPLES' SEXUAL AND PSYCHOLOGICAL OUTCOMES IN PROVOKED VESTIBULODYNIA

The manuscript prepared for this study is presented below. Readers are advised that Kate Rancourt, under the supervision of Dr. Natalie Rosen, was responsible for devising the research questions and hypotheses, and preparing the datasets for analyses. She was the lead on data analysis and interpretation, with the support of her co-authors. Kate wrote the initial draft of the manuscript, and received and incorporated feedback from her co-authors. The manuscript underwent peer-review, and required one revision, which Kate led the response to, prior to the manuscript's acceptance in *Archives of Sexual Behavior* on November 17, 2015. The full reference for this manuscript is:

Rancourt, K.M., Rosen, N.O., Bergeron, S., & Nealis, L.J. (2016). Talking about sex when sex is painful: Dyadic sexual communication is associated with women's pain, and couples' sexual and psychological outcomes in provoked vestibulodynia. *Archives of Sexual Behavior*, *45*(8), 1933-1944. doi: 10.1007/s10508-015-0670-6

2.1 Abstract

Provoked vestibulodynia (PVD) is a recurrent vulvo-vaginal pain condition associated with psychological and sexual consequences for affected women and their partners, including lower quality of dyadic sexual communication compared to pain-free couples. Although greater sexual communication is associated with positive sexual and relational outcomes for both pain-free couples and couples experiencing painful sex, little is known about its role in women's pain and psychological outcomes, especially in a relational context. The present study examined associations between dyadic sexual communication and pain, sexual satisfaction, sexual functioning, and depressive symptoms in a sample of 107 couples in which the woman was diagnosed with PVD via a standardized gynaecological assessment. Women completed a measure of pain intensity, and both members of the couple completed measures of their dyadic sexual communication, sexual satisfaction, sexual functioning, and depressive symptoms. Analyses were guided by the Actor-Partner Interdependence Model. Women's and partners' own perceptions of greater dyadic sexual communication were associated with their own greater sexual satisfaction and sexual functioning, and lower depressive symptoms. Partners' perceptions of greater dyadic sexual communication were also associated with women's lower pain and greater sexual satisfaction. Results point to the importance of dyadic coping conceptualizations for both individual and interpersonal outcomes in PVD. Dyadic sexual communication may be a key treatment target for interventions aimed at improving the pain and psychological and sexual impairments of women with PVD and their partners.

Keywords: sexual communication, provoked vestibulodynia, couples, vulvodynia, pain

2.2 Introduction

Provoked vestibulodynia (PVD), the most common subtype of vulvodynia, is a chronic vulvovaginal pain condition. PVD is the most prevalent cause of genito-pelvic pain and penetration disorder (DSM-5; APA, 2013) among pre-menopausal women in the general population, with estimates indicating that it affects between 7 to 12% of women (Harlow et al., 2014; Harlow & Stewart, 2003). PVD is most often described as a burning or cutting pain (Bergeron, Binik, Khalife, Pagidas, & Glazer, 2001) that is localized to the vulvar vestibule, and is elicited when pressure is applied to the area through both non-sexual (e.g., tampon insertion) and sexual activities (e.g., vaginal intercourse). The etiology of PVD is complex, with an array of biomedical, psychological, and social factors contributing to the onset and maintenance of the pain (Bergeron et al., 2015). In recent years, research has emphasized the influence of interpersonal factors in PVD (N. O. Rosen, Rancourt, et al., 2014); however, no studies to date have examined the role of couples' sexual communication on their multifactorial adjustment to this condition. The present study addresses this gap by examining associations between sexual communication and pain, sexual, and psychological outcomes in couples coping with PVD.

Growing empirical evidence highlights the negative impact of PVD on women's and partners' sexual and psychological adjustment. In qualitative studies, women with PVD report avoidance of affectionate or sexual contact with their partners for fear that it will lead to painful intercourse, illustrating the degree to which PVD may disrupt couples' intimacy and shared sexuality (Ayling & Ussher, 2008; Marriott & Thompson, 2008). Both women with PVD and their partners are more likely than unaffected couples

to experience reduced sexual satisfaction (Smith & Pukall, 2011, 2014). Controlled studies indicate that women with PVD report lower frequencies of intercourse and lower desire, as well as difficulties with arousal and orgasm (Masheb, Lozano-Blanco, Kohorn, Minkin, & Kerns, 2004), while male partners of women with PVD are more likely to experience erectile dysfunction (Pazmany et al., 2014; Smith & Pukall, 2014). In addition, both women with PVD and their partners experience increased symptoms of psychological distress, including depressive symptoms (Bergeron et al., 2015; Nylanderlundqvist & Bergdahl, 2003).

Dyadic context of PVD

Among women with PVD in relationships, the pain is most commonly triggered through partnered sexual activity. Given this interpersonal context, couples' interactions may contribute to their ability to navigate the impact of PVD on their individual and shared lives. Several studies in PVD samples demonstrate that relational factors influence women's pain and couples' sexual and psychological functioning (see (N. O. Rosen, Rancourt, et al., 2014) for review). For instance, greater facilitative partner responses to pain (i.e., encouraging adaptive coping) are associated with women's decreased pain and both partners' enhanced sexual satisfaction and functioning. In contrast, greater solicitous (i.e., sympathy or increased attention) and negative partner responses (i.e., expressing hostility or annoyance) are associated with women's increased pain and depressive symptoms and couples' less favourable sexual outcomes (N. O. Rosen et al., 2012; N. O. Rosen, Bergeron, Sadikaj, Glowacka, Baxter, et al., 2014; N. O. Rosen, Bergeron, Sadikaj, Glowacka, Delisle, et al., 2014).

Dyadic approaches offer empirical and theoretical gains by allowing for a more nuanced understanding of relational processes in couples coping with PVD. Dyadic models of chronic health conditions underscore the adjustment and coping of individual partners as occurring in relation to one another (R. G. Reed, Butler, & Kenny, 2013). Specifically, the Systems-Transactional Model indicates that when couples are faced with a stressor such as a partner's persistent health concern, partners may engage in both individual and dyadic level coping strategies, with each partner's coping efforts reciprocally influencing the other (Bodenmann, 1995). The Developmental-Contextual Model of dyadic coping in chronic illness extends these transactions to capture broader systemic processes that may influence couples' dyadic coping and subsequent adjustment (e.g., time, prior coping efforts, and qualities of the relationship; (Berg & Upchurch, 2007). Applying this model to couples with PVD, it could be hypothesized that aspects of their relationship, such as the quality of their communication, may influence their dyadic coping and, in turn, women's pain and the couples' sexual and psychological adjustment.

Sexual communication

Sexual communication refers to couples' interactions concerning sexual matters (e.g., disclosures of sexual preferences or discussions of sexual problems) (Mark & Jozkowski, 2013; Rehman, Rellini, et al., 2011). Until recently, sexual communication has largely been neglected in PVD (Pazmany et al., 2014, 2015; Smith & Pukall, 2014). This is noteworthy, as an abundance of evidence points to open and effective sexual communication as being an important determinant of increased sexual satisfaction and function among men and women in committed relationships (Hurlbert, 1991; MacNeil &

Byers, 2009; Mark & Jozkowski, 2013; Montesi et al., 2011; Rehman, Rellini, et al., 2011).

Sexual communication may contribute to couples' sexual well-being via two pathways – one instrumental and the other expressive (MacNeil & Byers, 2009). Through the instrumental pathway, couples' communication about sexual preferences is thought to facilitate change in their performance scripts (i.e., sexual behaviors they enact together) such that each partner experiences more sexual likes and fewer dislikes, and subsequently, greater sexual satisfaction. Through the expressive pathway, couples' sexual communication is thought to enhance perceptions of intimacy, thereby contributing to greater sexual satisfaction. Evidence supports these pathways in community samples of men and women in relationships (MacNeil & Byers, 2005, 2009). Although the instrumental and expressive pathways predict how sexual communication contributes to sexual satisfaction, they could conceivably also influence women's pain and associated impairments in couples' sexual function. If sexual communication facilitates change in sexual scripts via the instrumental pathway, in the context of PVD this may involve focusing less on activities that elicit pain, and more on pleasurable activities that facilitate sexual desire and arousal. Via the expressive pathway, enhancing intimacy through sexual communication might contribute to couples' greater sexual response, lower depression, and women's lower pain through more effective emotion regulation and pain coping (Cano & Williams, 2010; N. O. Rosen, Rancourt, et al., 2014).

Sexual communication in PVD

In vulvovaginal pain samples, uncontrolled studies indicate that a considerable proportion of women report poor sexual communication, or discomfort about discussing

sex with their partners (i.e., 49% and 36%, respectively; (Jelovsek et al., 2008; Schover et al., 1992)). Similarly, women experiencing dyspareunia (i.e., pain during intercourse) and their partners report lower dyadic sexual communication – between-partner discussions of sexual topics – than unaffected couples (Pazmany et al., 2015; Smith & Pukall, 2014).

Opening the lines of communication about sex may assist couples in mitigating the impact of PVD on their psychological and sexual well-being. Applying the Developmental-Contextual Model of coping, dyadic sexual communication may be a means by which couples can share and respond to one another's sexual stressors and develop strategies for managing the pain as it intersects with their sexuality (Berg & Upchurch, 2007). In PVD, recent studies have examined constructs related to communication, such as greater intimate exchanges (Bois et al., 2013), greater sexual assertiveness (Leclerc et al., 2015), and less ambivalence over emotional expression (Awada, Bergeron, Steben, Hainault, & McDuff, 2014), and have found that these constructs are associated with couples' better sexual satisfaction and functioning and lower depressive symptoms. Together, these studies suggest benefits of PVD couples' open and direct communication on their sexual and psychological adjustment.

Dyadic measurement of sexual communication

Although sexual communication in couple relationships necessitates the involvement of both members of the couple, prior studies have largely examined sexual communication as an intrapersonal phenomenon (e.g., sexual self-disclosure; (MacNeil & Byers, 2009; Rehman, Rellini, et al., 2011). Additionally, prior studies have primarily examined associations between sexual communication and outcomes separately for men and women (e.g., (MacNeil & Byers, 2009). Increasingly, couples' research is turning to

the use of dyadic data analytic approaches, such as the Actor-Partner Interdependence Model (APIM), which allow for the estimation of both intrapersonal and interpersonal effects while controlling for the non-independence of couple data (Kenny, Kashy, & Cook, 2006).

Only one study to date has employed dyadic methods to examine the association between sexual communication and outcomes in couples affected by pain during intercourse. In 38 women with dyspareunia and their partners, Pazmany and colleagues (2015) employed the APIM and found that women's greater dyadic sexual communication was associated with their own greater sexual functioning and relationship adjustment, and lower sexual distress. Additionally, partners' greater dyadic sexual communication was associated with their own greater relationship adjustment. The authors did not find an association between dyadic sexual communication and women's pain. Women in this study did not undergo a standardized gynaecological exam, and coupled with the self-reported nature of their dyspareunia symptoms, the heterogeneity of this sample limited the generalizability of these findings to PVD couples. Moreover, the small sample size may have limited the authors' power to determine statistically significant effects of a smaller magnitude (e.g., associations with pain). Finally, given the numerous adverse consequences associated with PVD, it is important to examine associations between dyadic sexual communication and other key outcomes, including sexual satisfaction and depression.

In summary, although empirical evidence demonstrates robust associations between sexual communication and the sexual well-being of individuals in community samples (e.g., (Mark & Jozkowski, 2013; Montesi et al., 2011; Rehman, Janssen, et al.,

2011)), only one study has evaluated associations between sexual communication and sexuality in a clinical sample of couples afflicted by painful intercourse (Pazmany et al., 2015). In addition, to our knowledge, no research in PVD evaluates associations between sexual communication and other important domains of functioning, such as depressive symptoms. Moreover, prior studies have been atheoretical, and failed to take into account the dyadic context of sexual communication in its measurement, research design, and statistical methods.

Objectives

The present study examined the associations between dyadic sexual communication and women's pain intensity, as well as the sexual adjustment (i.e., sexual satisfaction and functioning), and psychological adjustment (i.e., depressive symptoms) of women with PVD and their partners. We hypothesized that women's and partners' perceptions of higher quality dyadic sexual communication would be associated with women's lower pain. We also hypothesized that an individual's perceptions of higher quality dyadic sexual communication would be associated with their own, as well as their partners', greater sexual satisfaction, greater sexual functioning, and lower depressive symptoms.

2.3 Method

2.3.1 Participants

Women and their romantic partners were recruited between July 2010 and November 2014 to participate in the present study. Two-hundred and seventy-three women contacted the laboratory and were provided with information about the study. Women were recruited through community print and online advertisements (N = 194;

71%), via referrals from local health care providers (*N* = 41; 15%), from previous participation in research studies conducted in our laboratory (*N* = 22; 8%), and unknown sources (*N* = 16; 6%). Of these initial contacts, 94 women (34%) indicated that they were not interested in participating for various reasons (e.g., time commitment, childcare barriers, discomfort with study procedures, and lost to contact). Interested women (*N* = 179) were screened for eligibility using a structured telephone interview and were then asked to attend a diagnostic gynaecological examination. Eligibility criteria included: (1) women experiencing pain during intercourse on 75% of intercourse attempts for a minimum of six months; (2) women's pain elicited only by pressure to the vulvar vestibule (e.g., intercourse, tampon insertion); (3) women receiving a diagnosis of PVD from one of our collaborating physicians following a standardized cotton-swab test (i.e., randomized palpation to the vulvar vestibule at 3, 6, and 9 o'clock accompanied by women's self-reported pain ratings on a 0-10 scale (Bergeron, Binik, Khalife, Pagidas, & Glazer, 2001); (4) couples being in a committed relationship for a minimum of six months; (5) couples cohabiting or having a minimum of four in-person contacts per week. Couples were ineligible if they met any of the following exclusion criteria: (1) age less than 18 years (women and partners) or greater than 45 years (women); (2) presence of an active vaginal infection (self-reported or diagnosed during the gynaecological examination); (3) diagnosis of vaginismus (as defined by DSM-IV-TR, 2000); (4) currently pregnant or planning a pregnancy. Following the screening interview, women were asked to confirm their partners' interest in participation. Seventy-two women (26% of initial contacts) were deemed ineligible for the study for the following reasons: partner ineligible/not interested (*N* = 15), the woman did not meet diagnostic criteria for PVD (*N*

= 16), ineligible relationship status (N = 24), age (N = 6), other (N = 11). This study included a final sample of 107 women and their male partners.

2.3.2 Procedure

Data for the present manuscript were collected from couples participating in two larger studies, both following the same recruitment protocol discussed above, and one of which is being conducted across two cities. The eligibility criteria and PVD diagnostic procedures were consistent across each study and city. Eighty-nine couples (83%) participated in a daily diary study of PVD couples in city one only, whereas 18 couples (17%) were entering a treatment study for PVD in cities one and two. Couples completed the current study measures as part of their baseline assessment *before* beginning the diaries or treatment. The majority of couples (N = 98; 92%) participated in city one. While portions of the data from the baseline assessments of the larger studies have been presented elsewhere (Boerner & Rosen, 2015; N. O. Rosen et al., 2012), this is the first study from this sample to examine associations between dyadic sexual communication and women's pain, and couples' sexual and psychological outcomes.

The institutions' research ethics boards approved each of the two larger studies. Following their eligibility assessment, couples attended an orientation session with a research assistant and provided their informed consent to participate. They then completed the online self-report measures on separate computers. Couples were instructed not to discuss the measures with one another. Couples were provided compensation in appreciation of their participation, commensurate with the larger study that they participated in.

2.3.3 Measures

Dyadic Sexual Communication. Sexual communication was measured using the Dyadic Sexual Communication (DSC) scale (Catania, 1986), a 13-item measure that assesses couples' perceptions of their joint communication around their sexual relationship (e.g., "*My partner and I can usually talk calmly about our sex life"*). Each item is rated on a 6-point likert-type scale from 1 (strongly disagree) to 6 (strongly agree). Scores are summed, with total scores ranging from 13 to 78. Higher scores on the DSC scale are indicative of couples' higher quality of communication around sexual matters. The DSC scale has demonstrated good internal consistency, and items load onto a single factor of sexual communication. Cronbach's alpha for the present sample was 0.81 for women, and 0.84 for partners.

Pain. Women's average pain intensity during intercourse during the last six months was assessed using a numerical rating scale (NRS) that ranged from "no pain" to "worst pain ever". Numerical rating scales are recommended for the assessment of clinical pain intensity, and correspond to other measures of pain intensity (e.g., (Hjermstad et al., 2011). Of the present sample, 73% of women ($N = 78$) rated their pain on a 1-10 scale, and the remaining 27% of women ($N = 29$) rated their pain on a 0-10 scale. For the present analyses, scores were standardized so that all pain intensity ratings were on the same metric.

Sexual Satisfaction. Satisfaction with the sexual relationship was measured using the 5-item Global Measure of Sexual Satisfaction (GMSEX; (Lawrance & Byers, 1995). Each item is rated on a 7-point likert scale, with anchors representing bipolar adjectives (e.g., good-bad, satisfying-unsatisfying). Scores are summed, and total scores range from

5 to 35, with higher scores indicating greater sexual satisfaction. The GMSEX has demonstrated high internal consistency and construct validity (Lawrance & Byers, 1995). Cronbach's alpha for the present sample was 0.93 for women, and 0.94 for partners.

Women's Sexual Functioning. Women's sexual functioning was measured using the Female Sexual Function Index (FSFI; (R. C. Rosen et al., 2000), a 19-item self-report measure. The FSFI measures six domains of sexual functioning: desire, arousal, orgasm, lubrication, satisfaction, and pain. Total scores range from 2 to 36, with higher scores indicating better sexual functioning. In several studies, the FSFI has demonstrated good internal consistency and construct validity (e.g., (R. C. Rosen et al., 2000; Wiegel, Meston, & Rosen, 2005), and has shown evidence of discriminant validity in a sample of women with vulvodynia (Masheb et al., 2004). In the present study, only a subsample of 86 women (80% of the full sample) were administered this measure and were included in relevant analyses. Cronbach's alpha in this subsample was 0.94.

Men's Sexual Functioning. Men's sexual functioning was measured using the International Index of Erectile Function (IIEF; (R. C. Rosen et al., 1997), a 15-item self-report measure that evaluates five domains of male sexual functioning, including: erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction. Scores are summed, with total scores ranging from 5 to 75, and higher scores indicating better sexual functioning. The IIEF has demonstrated high internal consistency, discriminant validity, and good construct validity (e.g., (R. C. Rosen et al., 1997). Only a subsample of 86 men (80% of the full sample) were administered this measure and were included in relevant analyses. Cronbach's alpha in this subsample was 0.89.

Depressive Symptoms. Depressive symptoms were measured using the Beck Depression Inventory – II (BDI-II; (Beck, Steer, & Brown, 1996), an established self-report measure that has demonstrated good construct validity and internal consistency in chronic pain populations (e.g., (Harris & D'Eon, 2008). The BDI-II consists of 21 items measured on a scale of 0 (low intensity) to 3 (high intensity). Scores are summed, with total scores range from 0 to 63, and higher scores indicating greater depressive symptomatology. In this sample, Cronbach's alpha for women was 0.92, and for men was 0.90.

2.3.4 Data analyses

Of the 107 couples in this study, 86 couples had completed all study measures and were included in all analyses, whereas 21 couples were excluded from the sexual function analyses because they were not administered the FSFI and IIEF. Of the 107 couples, minimal data were missing for each measure (<3.5% at the item-level). Expectation maximization was used to impute item-level missing data. This approach is indicated as a small amount of data were missing (< 5.0%) and data were missing completely at random (Scheffer, 2002), as indicated by a non-significant Little's MCAR test, $\chi^2 = 460.29$, $p = .65$ (Little, 1988). T-tests were used to examine whether women's and partners' dyadic sexual communication and outcome scores differed by study type (i.e., pre-daily diary or pre-treatment study). Pearson's correlations were conducted to examine intercorrelations amongst study variables, and to evaluate the need to control for sociodemographic covariates in the primary analyses. Sociodemographic variables that were correlated with outcome variables at $r \geq .30$ were included as covariates in the primary analyses (Frigon & Laurencelle, 1993). All preliminary analyses were conducted in SPSS version 22.

Given the non-independence of dyadic data (e.g., (Kenny et al., 2006), we employed Actor-Partner Interdependence Models (APIMs) to examine the influence of dyadic sexual communication on women's pain and couples' sexual and psychological outcomes. APIMs examine the influence of intrapersonal (i.e., actor) and interpersonal (i.e., partner) effects while accounting for the non-independence of couple data. Thus, actor effects captured the influence of an individual's dyadic sexual communication on their own outcomes (paths labelled *a* in Figure 1), and partner effects captured the influence of an individual's dyadic sexual communication on their partner's outcomes (paths labelled *b* in Figure 1). APIMs were implemented using path analysis with robust maximum likelihood estimation. Consistent with published recommendations regarding the APIM, women's and partners' predictors were grand-mean centered and were allowed to covary, and correlated errors were specified between women's and partners' outcomes (Kenny et al., 2006). To allow for an APIM to be modelled for the effect of dyadic sexual communication on women's and men's sexual functioning, scores on the FSFI and the IIEF were independently standardized using z-scores so that they would be on the same metric. The effects of dyadic sexual communication on pain intensity were analyzed using path analysis, but an APIM was not modeled as only women gave ratings of pain intensity. All path analyses were conducted using Mplus 7.3 (Muthén & Muthén, 2014).

2.4 Results

Descriptive statistics

Table 2.7.1 presents the descriptive statistics for the sociodemographic variables of this sample. All partners that participated in this study were male; therefore, for ease of

comprehension, partners will be referred to as "men" from this point forward. Women entering the daily diary study reported more years of education (M = 17.61; SD = 1.61) than women entering the treatment study (M = 16.12; SD = 2.93), $t(105) = 2.09$, p =.04. Table 2.7.2 presents the descriptive statistics for predictor and outcome variables in this sample. Both women and men entering the daily diary study reported significantly greater depressive symptoms (women: M = 16.07, SD = 10.34; men: M = 9.44, SD = 7.67) than those entering the treatment study (women: M = 9.23, SD = 7.71, $t(105) = 2.64$, p = .01; men: M = 4.67, SD = 5.52, $t(105) = 2.51$, p = .01). Thus, for the APIM on depressive symptoms, study type was included as a covariate. Women entering the treatment study also reported significantly lower dyadic sexual communication (M = 55.11, SD = 11.90) than women entering the daily diary study (M = 61.01, SD = 10.49); $t(105) = -2.13$, p = .04. Consequently, the APIMs were modeled while controlling for the effect of study type on dyadic sexual communication. When controlling for the influence of study type, the pattern and significance of the results remained the same as the APIMs conducted without study type. As a result, the most parsimonious models are presented.

Preliminary analyses also examined correlations between sociodemographic characteristics and women's and men's outcome variables to assess for the need to include covariates in the primary analyses. Women's and men's age was negatively correlated with men's sexual functioning at or above .30, the criterion set for the inclusion of covariates (women: $r = -.31$, $p < .01$; men: $r = -.30$, $p < .01$); therefore age was the only covariate included in the primary analyses, and only for the APIM on sexual functioning. The patterns and significance of the results remained the same when

including age as a covariate in the model, and as such, the most parsimonious model is presented below.

Bivariate correlations

Table 2.7.3 shows the correlations between dyadic sexual communication, women's pain, and sexual and psychological outcomes for women and men (i.e., intrapersonal effects), and between women and men (i.e., interpersonal effects). Women's reported dyadic sexual communication was correlated positively with measures of their own sexual satisfaction and sexual functioning, and was correlated negatively with depressive symptoms. A similar pattern was evident for men. Interpersonal effects were present between dyadic sexual communication and all outcomes except depressive symptoms. While men's reports of dyadic sexual communication showed a negative correlation with women's pain intensity, women's reports of dyadic sexual communication showed no relation to pain intensity. The effects in Table 2.7.3 are generally larger within person than between persons.

Table 2.7.3 also shows correlations between women's and men's reports on the same measure (e.g., dyadic sexual communication). Women's reports were all correlated with men's reports of the same measures, except for depressive symptoms. Finally, Table 2.7.3 shows that sexual satisfaction correlated with measures of sexual functioning within women, within men, and between women and men.

Dyadic sexual communication and pain intensity

Figure 2 shows the path model for associations between women's and men's reported dyadic sexual communication and women's pain intensity. There was a significant, negative effect of men's reported dyadic sexual communication on women's

pain intensity (b = -.02, p < .01; Figure 2A), indicating that men's perceptions of greater dyadic sexual communication was associated with women's lower pain intensity. The effect of women's dyadic sexual communication on their own pain intensity was not significant.

Dyadic sexual communication and sexual outcomes

Figure 2 also shows the APIMs for associations between women's and men's reported dyadic sexual communication and women's and men's sexual satisfaction and sexual functioning. For sexual satisfaction (Figure 2B), there was a significant, positive actor effect for women (b = .25, p < .001) and for men (b = .36, p < .001), such that individuals' perceptions of greater dyadic sexual communication were associated with their own greater sexual satisfaction. There was also a significant, positive partner effect for women (b = .17, p < .01), indicating that men's perceptions of greater dyadic sexual communication were associated with women's greater sexual satisfaction; the partner effect for men was non-significant. For sexual functioning (Figure 2C), there were significant, positive actor effects for women (b = .04, p < .001) and for men (b = .04, p < .001), indicating that individuals' perceptions of greater dyadic sexual communication were associated with their own greater sexual functioning. The partner effects for dyadic sexual communication on sexual functioning were non-significant.

Dyadic sexual communication and depressive symptoms

Figure 2D shows the APIM for women's and men's reported dyadic sexual communication predicting depressive symptoms, controlling for the effect of study type. Results revealed significant, negative actor effects for women (b = -0.25, p < .01) and men (b = -.25, p < .001), indicating that individuals' perceptions of greater sexual

communication was associated with their own lower depressive symptoms. The partner effects for dyadic sexual communication on depressive symptoms were non-significant.

2.5 Discussion

This study examined the associations between dyadic sexual communication and women's pain, and couples' psychological and sexual adjustment in a sample of women with PVD and their male partners. Findings indicated that women's and men's perceptions of greater dyadic sexual communication were associated with the individuals' own higher sexual satisfaction, enhanced sexual functioning, and lower depressive symptoms. Additionally, men's reported greater dyadic sexual communication was associated with women's higher sexual satisfaction and lower pain intensity. These findings are in line with existing literature on the associations between sexual communication and sexual well-being in community and dyspareunia samples (e.g., (Pazmany et al., 2015; Rehman, Janssen, et al., 2011), and extend to other important outcome domains in PVD, including women's pain and couples' depressive symptomatology.

Consistent with our hypotheses, men's report of greater dyadic sexual communication was associated with women's lower pain during intercourse. This finding stands in contrast to the lack of association found in the study by Pazmany and colleagues (2015). It is possible that our more homogeneous and larger sample provided greater power to find this statistically significant effect. In line with the Developmental-Contextual Model of dyadic coping, when male partners perceive that the couple has more open communication about sex, it may help them appraise and respond to the pain in ways that positively influence the coping of the dyad (i.e., one or both members of the

couple responding adaptively to the pain; (Berg & Upchurch, 2007; Bodenmann, 1995). In this way, men perceiving greater sexual communication may act as a catalyst for couples' activation of individual or dyadic cognitive, behavioral, and emotional responses that positively influence women's pain. Specifically, men's perceptions of higher dyadic sexual communication may indicate a greater openness to discussing pain and ways to manage it. In turn, this may help couples to identify and enact coping strategies that reduce women's pain, such as facilitative partner responses to pain (e.g., expressions of affection), adapting sexual activities to include less painful or non-painful behaviors, and reducing avoidance – all factors that have been previously linked to women's lower pain during intercourse (Desrochers et al., 2009; N. O. Rosen et al., 2012).

Surprisingly, we did not find an association between women's perceptions of dyadic sexual communication and their own pain. One explanation for this unexpected finding is that other relational variables, such as partner responses to women's pain (N. O. Rosen et al., 2012; N. O. Rosen, Bergeron, Sadikaj, Glowacka, Baxter, et al., 2014; N. O. Rosen, Bergeron, Sadikaj, Glowacka, Delisle, et al., 2014), may be more salient to women's pain experience than their perceptions of the quality of sexual communication in their relationship. Alternatively, there are prior indications in the PVD literature of partner-reported variables better predicting women's pain intensity than women's own reports (N. O. Rosen, Bergeron, Leclerc, Lambert, & Steben, 2010). Given the paradoxical nature of this result, future research should attempt to replicate this finding, perhaps by examining whether it persists using alternative measures of sexual communication. Additionally, future research should examine the mechanisms by which partner-reported dyadic sexual communication impacts women's pain. Taken together

with other recent reports in the literature of associations between partner variables and women's pain (N. O. Rosen, Rancourt, et al., 2014), our findings further suggest that the partner's perspective may sometimes be as important as the woman's own experience of PVD and highlight the relevance of studying this condition from a dyadic perspective.

As expected, women's and men's reports of greater dyadic sexual communication was associated with their own higher sexual satisfaction and sexual functioning. Men's reported greater dyadic sexual communication was also associated with women's higher sexual satisfaction. Applying the instrumental pathway linking sexual communication and sexual outcomes to PVD couples (MacNeil & Byers, 2009), dyadic sexual communication may increase couples' clarity around the impact of pain on their shared sexuality, thereby allowing them to modify their sexual script to accommodate the pain while also maintaining a mutually functional and satisfying sex life. In a qualitative study involving the intimate partners of cancer patients, couples' open and constructive sexual communication was identified as the predominant means by which they successfully renegotiated their sexual relationship in the context of cancer (Gilbert, Ussher, & Perz, 2008). In PVD, this renegotiation may involve couples redefining or diversifying their sexual script to focus less on sexual behaviors that elicit pain and more on those that facilitate pleasure. This shift in focus might enhance both partners' experiences of sexual desire and arousal, women's lubrication, and couples' overall sexual enjoyment. Open sexual communication may be particularly salient for women with PVD, as indicated by the partner effect of men's dyadic sexual communication on women's sexual satisfaction. When men perceive sexual communication to be higher, they may be more likely to express to women their willingness and interest in discussing sex and the pain. As women

with vulvovaginal pain are reticent to communicate with their partners about sex (Jelovsek et al., 2008), this may promote feelings of validation and intimacy in women and limit their tendency to avoid these discussions, thereby positively influencing their sexual satisfaction (Bois et al., 2013).

Consistent with our expectations, actor effects indicated that women's and men's own perceptions of greater dyadic sexual communication were associated with the individuals' own lower depressive symptoms. These findings highlight the importance of an inherently interpersonal variable – dyadic sexual communication – not only for interpersonal experiences (e.g., sexual outcomes), but also for both partners' psychological adjustment, which is adversely affected by PVD (Bergeron et al., 2015; Nylanderlundqvist & Bergdahl, 2003). A number of studies have demonstrated the influence of relational variables on individual patients' and partners' adjustment to illness (Berg & Upchurch, 2007; Manne & Badr, 2008), emphasizing the importance of considering both the individual and relational levels of the couple, and how these two levels of the system interact (Bodenmann, 1995).

In couples affected by PVD, greater dyadic sexual communication may allow women and men to foster greater intimacy by conveying empathy to one another around the impact that pain is having on their sexual relationship. This experience of validation facilitates greater emotion regulation in couples (Leong et al., 2011), which may contribute to women and men experiencing fewer depressive symptoms. Sexual communication may also help couples become more accepting of the pain's presence by allowing them to reflect together on the inherent value they place on their sexual relationship, thereby contributing to fewer depressive symptoms (Boerner & Rosen,

2015). Additionally, couples' greater sexual communication may allow women and men to discuss ways of addressing the impact of pain on their lives, thus building a sense of empowerment, togetherness and efficacy for coping with the pain. Enhanced intimacy and dyadic coping efforts may decrease the depressive symptoms often reported by women with PVD, such as isolation, hopelessness, shame, and inadequacy (Ayling & Ussher, 2008; Sheppard et al., 2008).

This study has numerous strengths. This was the first study to examine associations between dyadic sexual communication and relevant sexual outcomes in couples in which the woman received a standardized, clinical diagnosis of PVD, leading to a homogeneous sample. Relative to Pazmany and colleagues (2015), this study included over twice as many couples, which increased our power to determine statistical significance of smaller effects. Additionally, given the growing use of dyadic models in studies of health and illness, the use of a dyadic design and analytic approach was a notable strength. In researchers' attempts to understand the onset and course of sexual problems, it is a relevant and critical extension to incorporate dyadic perspectives. From a theoretical standpoint, this study elaborates upon existing models of sexual communication (i.e., the instrumental and expressive pathways), which have only been studied in relation to community samples and have been restricted to sexual satisfaction outcomes.

The limitations of this study are also worth noting. First, the study sample was relatively homogeneous in terms of ethnicity, socioeconomic status, and sexual orientation. Additionally, our eligibility criteria required couples to be sexually active and therefore our sample might represent couples that are less avoidant, have less severe pain,

or who are better managing the pain. While the characteristics of this sample are comparable to other PVD samples (Brotto et al., 2014; Smith & Pukall, 2014), they limit the generalizability of our findings to couples impacted by PVD or other forms of vulvovaginal pain that do not share these characteristics. Second, couples entering the treatment study reported lower depressive symptoms than couples entering the daily diary study. While this may suggest a sampling bias, far fewer couples in this report were drawn from the treatment study; thus, differences in sample sizes may have also influenced this finding. Third, this study employed a cross-sectional research design, meaning that alternative explanations for our results are possible. For example, higher sexual function and sexual satisfaction may facilitate couples' open sexual communication, which to our knowledge, is a potential pathway that has not yet been examined. Given the transactional nature of relational processes (Berg & Upchurch, 2007; Bodenmann, 1995), the associations between sexual communication and outcome variables may be reciprocal such that dyadic sexual communication both influences and is influenced by interdependent (e.g., sexual satisfaction) and independent outcomes (e.g., depressive symptoms). As such, future longitudinal research is needed to improve our understanding of sexual communication processes in PVD.

In conclusion, this study examined the associations between couples' sexual communication, women's pain, and couples' sexual and psychological adjustment to PVD. Results demonstrated positive associations between women's and men's reported dyadic sexual communication and their sexual satisfaction and functioning, and negative associations between reported dyadic sexual communication and depressive symptoms. Moreover, results emphasize the importance of men's perceptions of dyadic sexual

communication on women's pain and sexual satisfaction, underscoring the interdependent nature of couples' sexual experiences as they relate to pain. Given that dyadic sexual communication is lower in couples affected by vulvo-vaginal pain as compared to pain-free couples (Pazmany et al., 2014; Smith & Pukall, 2014), these results point to the value of targeting couples' sexual communication in interventions for PVD. Indeed, couples completing cognitive-behavioral couples therapy for PVD indicated that building communication skills was a highly valued aspect of the intervention (Corsini-Munt, Bergeron, Rosen, Mayrand, et al., 2014). Findings suggest that integrating sexual communication skills training into treatments for PVD may have the capacity to positively influence multiple domains of couples' adjustment (i.e., biological, psychological, and sexual). Therefore, for couples coping with PVD, sexual communication may be one of their most important tools in navigating the stressors associated with the condition and reducing impairments.

2.6 Acknowledgments

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2.7 Tables

Table 2.7.1

Sociodemographic characteristics for the sample (N = 107)

Variable	*M* (range) or *n*	*SD* or %
Age		
Women [a]	28.27 (18–44)	6.14
Men	30.22 (19–50)	7.38
Education (years)		
Women	16.37 (11–27)	2.80
Men	16.09 (11–31)	3.21
Culture		
Women		
Canadian/American	100	93.46
European	5	4.67
Other	2	1.87
Men		
Canadian/American	95	88.79
European	5	4.67
Other	7	6.54
Couples' annual income		
$0-19,999	9	8.41
$20,000 – 39,999	21	19.63
$40,000 – 59,000	18	16.82
>$60,000	59	55.14
Relationship status		
Married	46	42.99
Relationship length (months)	74.36 (5–240)	59.30
Women's pain duration (months) [a]	75.33 (6–312)	58.13

[a] $n = 106$

Table 2.7.2

Scores on study predictor and outcome measures for women with PVD and men (n = 107)

Variable	*M*	*SD*	Range	
			Min	Max
Dyadic sexual communication				
Women	60.02	10.91	32	78
Men	59.22	11.49	33	78
Women's pain intensity [a]	6.42	1.87	0	10
Sexual satisfaction				
Women	21.15	7.84	5	35
Men	23.50	7.38	6	35
Sexual function				
Women (FSFI) [b]	18.48	6.70	2.4	34.3
Men (IIEF) [b]	57.72	11.64	17	73
Depressive symptoms				
Women	14.93	10.23	0	43
Men	8.64	7.54	0	33

[a] Re-scaled scores for pain intensity (to be on 0–10 scale)
[b] $n = 86$

Table 2.7.3

Bivariate correlations between predictor and outcome variables in women with PVD and men (n = 107)

		Dyadic Sexual Communication		Pain	Sexual outcomes				Depression	
		DSC		NRS	GMSEX		FSFI [a]	IIEF [a]	BDI	
Scale	Source	W	M	W	W	M	W	M	W	M
DSC	Women (W)	–	**.37****	.03	.44**	**.30****	.46**	**.29****	−.23*	**−.05**
	Men (M)	–	–	**−.21***	**.38****	.60**	**.29****	.47**	**−.18**	−.38**
NRS	Women (W)	–	–	–	−.15	**−.24***	−.01	**−.11**	.26**	**.07**
GMSEX	Women (W)	–	–	–	–	**.56****	.57**	**.28****	−.28**	**−.08**
	Men (M)	–	–	–	–	–	**.36****	.56**	**−.10**	−.27**
FSFI [a]	Women (W)	–	–	–	–	–	–	.38**	−.32**	**−.09**
IIEF [a]	Men (M)	–	–	–	–	–	–	–	**−.06**	−.29**
BDI	Women (W)	–	–	–	–	–	–	–	–	**.08**
	Men (M)	–	–	–	–	–	–	–	–	–

*$p < .05$; **$p < .01$; [a] $n = 86$

Bolded values represent between-partner correlations. DSC = Dyadic Sexual Communication Scale; GMSEX = Global Measure of Sexual Satisfaction; FSFI = Female Sexual Functioning Scale; IIEF = International Index of Erectile Functioning; BDI = Beck Depression Inventory; NRS = Pain intensity during intercourse (z-score). A bivariate correlation in the range of .10 signifies a small effect size; a bivariate correlation in the range of .30 signifies a medium effect size; a bivariate correlation in the range of .50 signifies a large effect size.

2.8 Figures

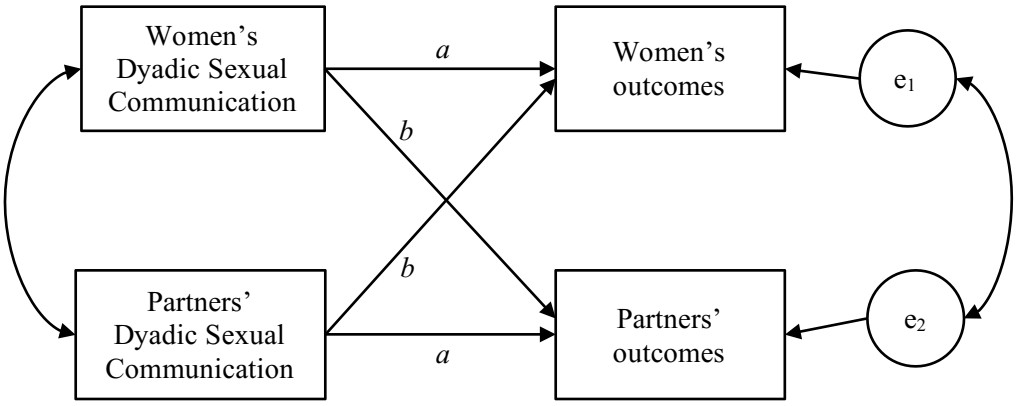

Figure 2.8.1. The actor-partner interdependence model. Actor effects are represented by the *a* pathways, and partner effects are represented by the *b* pathways. The terms e_1 and e_2 represent the unexplained variance in women's and men's outcome data, respectively. Single headed arrows represent unstandardized regression coefficients and double-headed arrows represent covariances.

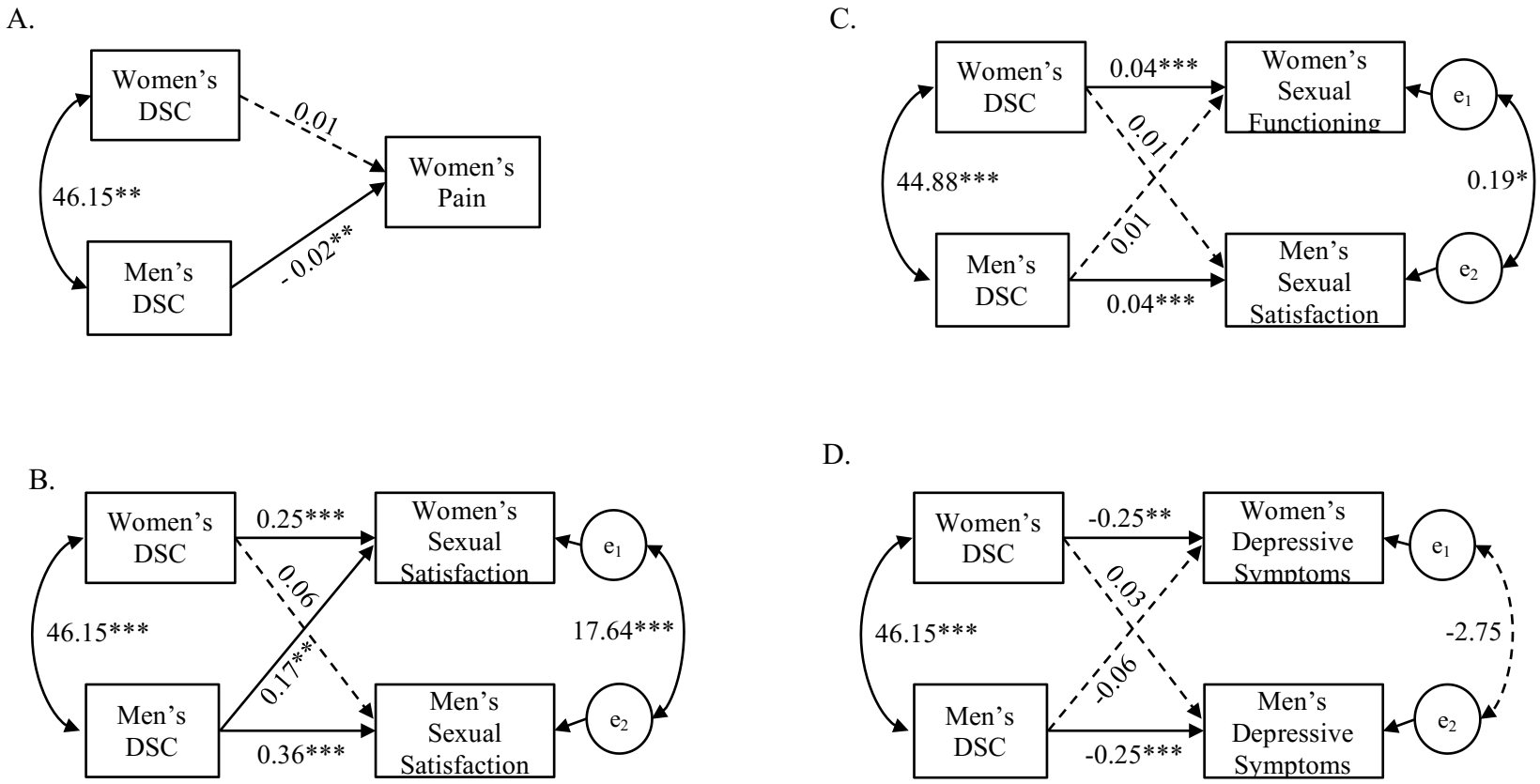

Figure 2.8.2. The effects of women and men's dyadic sexual communication (DSC) on women's pain intensity (2A), and women and men's sexual satisfaction (2B), sexual functioning (2C), and depressive symptoms (2D) (controlling for study type). Single headed arrows represent unstandardized regression coefficients and double-headed arrows represent covariances. Non-significant paths represented by dashed lines. * $p < .05$. ** $p < .01$. *** $p < .001$

2.9 References

Awada, N., Bergeron, S., Steben, M., Hainault, V.-A., & McDuff, P. (2014). To say or not to say: Dyadic ambivalence over emotional expression and its associations with pain, sexuality, and distress in couples coping with provoked vestibulodynia. *The Journal of Sexual Medicine, 11*, 1271-1282. doi: 10.1111/jsm.12463

Ayling, K., & Ussher, J. M. (2007). "If sex hurts, am I still a woman?" The subjective experience of vulvodynia in hetero-sexual women. *Archives of Sexual Behavior, 37*, 294-304. doi: 10.1007/s10508-007-9204-1

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.

Berg, C. A., & Upchurch, R. (2007). A developmental-contextual model of couples coping with chronic illness across the adult life span. *Psychological Bulletin, 133*, 920-954. doi: 10.1037/0033-2909.133.6.920

Bergeron, S., Binik, Y. M., Khalifé, S., Pagidas, K., & Glazer, H. I. (2001). Vulvar vestibulitis syndrome: Reliability of diagnosis and evaluation of current diagnostic criteria. *Obstetrics & Gynecology, 98*, 45-51. doi: 10.1016/S0029-7844(01)01389-8

Bergeron, S., Corsini-Munt, S., Aerts, L., Rancourt, K. M., & Rosen, N. O. (2015). Female sexual pain disorders: A review of the literature on etiology and treatment. *Current Sexual Health Reports*, *7,* 1-11. doi: 10.1007/s11930-015-0053-y

Bodenmann, G. (1995). A systemic-transactional conceptualization of stress and coping in couples. *Swiss Journal of Psychology*, *54*(1), 34-49.

Boerner, K., & Rosen, N. O. (2015). Acceptance of vulvovaginal pain in women with provked vestibulodynia and their partners: Associations with pain, psychological, and sexual adjustment. *The Journal of Sexual Medicine, 12*, 1450-1462. doi: 10.1111/jsm.12889

Bois, K., Bergeron, S., Rosen, N. O., McDuff, P., & Grégoire, C. (2013). Sexual and relationship intimacy among women with provoked vestibulodynia and their partners: Associations with sexual satisfaction, sexual function, and pain self-efficacy. *The Journal of Sexual Medicine, 10*, 2024-2035. doi: 10.1111/jsm.12210

Brotto, L. A., Sadownik, L. A., Thomson, S., Dayan, M., Smith, K. B., Seal, B. N., . . . Zhang, A. (2014). A comparison of demographic and psychosexual characteristics of women with primary versus secondary provoked vestibulodynia. *The Clinical Journal of Pain, 30*, 428-435. doi: 10.1097/AJP.0b013e31829ea118

Cano, A., & Williams, A. C. d. C. (2010). Social interaction in pain: Reinforcing pain behaviors or building intimacy? *PAIN, 149*, 9-11. doi: 10.1016/j.pain.2009.10.010

Catania, J. A. (1986). *Help-seeking: An avenue for adult sexual development.* (Doctoral Thesis).

Catania, J. A. (2011). The Dyadic Sexual Communication Scale. In T. D. Fisher, C. M. Davis, W. L. Yarber, & S. L. Davis (Eds.), (3 ed.).

Corsini-Munt, S., Bergeron, S., Rosen, N. O., Mayrand, M.-H., & Delisle, I. (2014). Feasibility and preliminary effectiveness of a novel cognitive-behavioral couple therapy for provoked vestibulodynia: A pilot study. *The Journal of Sexual Medicine, 11*, 2515-2527. doi: 10.1111/jsm.12646

Desrochers, G., Bergeron, S., Khalifé, S., Dupuis, M.-J., & Jodoin, M. (2009). Fear avoidance and self-efficacy in relation to pain and sexual impairment in women with provoked vestibulodynia. *The Clinical Journal of Pain, 25*, 520-527. doi: 10.1097/AJP.0b013e31819976e3

Diagnostic and Statistical Manual of Mental Disorders: DSM-5. (2013). American Psychiatric Association.

Diagnostic and Statistical Manual of Mental Disorders: DSM-IV Text Revision. (2000). American Psychiatric Association.

Frigon, J., & Laurencelle, L. (1993). Analysis of covariance: A proposed algorithm. *Educational and Psychological Measurement, 53*, 1-18. doi: 10.1177/0013164493053001001

Gilbert, E., Ussher, J. M., & Perz, J. (2008). Renegotiating sexuality and intimacy in the context of cancer: The experiences of carers. *Archives of Sexual Behavior, 39*, 998-1009. doi: 10.1007/s10508-008-9416-z

Harlow, B. L., Kunitz, C. G., Nguyen, R. H. N., Rydell, S. A., Turner, R. M., & MacLehose, R. F. (2014). Prevalence of symptoms consistent with a diagnosis of vulvodynia: Population-based estimates from 2 geographic regions. *American Journal of Obstetrics and Gynecology, 210*, 40.e1-40.e8. doi: 10.1016/j.ajog.2013.09.033

Harlow, B. L., & Stewart, E. G. (2003). A population-based assessment of chronic unexplained vulvar pain: Have we underestimated the prevalence of vulvodynia? *Journal of the American Medical Women's Association (1972), 58*(2), 82-88.

Harris, C. A., & D'Eon, J. L. (2008). Psychometric properties of the Beck Depression Inventory--second edition (BDI-II) in individuals with chronic pain. *PAIN, 137*, 609-622. doi: 10.1016/j.pain.2007.10.022

Hjermstad, M. J., Fayers, P. M., Haugen, D. F., Caraceni, A., Hanks, G. W., Loge, J. H., . . . (EPCRC), E. P. C. R. C. (2011). Studies comparing Numerical Rating Scales, Verbal Rating Scales, and Visual Analogue Scales for assessment of pain intensity in adults: a systematic literature review. *Journal of Pain and Symptom Management, 41*, 1073-1093. doi: 10.1016/j.jpainsymman.2010.08.016

Hurlbert, D. F. (1991). The role of assertiveness in female sexuality: a comparative study between sexually assertive and sexually nonassertive women. *Journal of Sex & Marital Therapy, 17*, 183-190. doi: 10.1080/00926239108404342

Jelovsek, J. E., Walters, M. D., & Barber, M. D. (2008). Psychosocial impact of chronic vulvovagina conditions. *The Journal of Reproductive Medicine, 53*(2), 75-82.

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*: Guilford Press.

Lawrance, K. A., & Byers, E. S. (1995). Sexual satisfaction in long-term heterosexual relationships: The interpersonal exchange model of sexual satisfaction. *Personal Relationships, 2*, 267-285. doi: 10.1111/j.1475-6811.1995.tb00092.x

Leclerc, B., Bergeron, S., Brassard, A., Bélanger, C., Steben, M., & Lambert, B. (2014). Attachment, sexual Assertiveness, and sexual outcomes in women with provoked vestibulodynia and their partners: A mediation model. *Archives of Sexual Behavior, 44,* 1561-1572. doi: 10.1007/s10508-014-0295-1

Leong, L. E. M., Cano, A., & Johansen, A. B. (2011). Sequential and base rate analysis of emotional validation and invalidation in chronic pain couples: Patient gender matters. *The Journal of Pain, 12*, 1140-1148. doi: 10.1016/j.jpain.2011.04.004

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*, 1198-1202. doi: 10.1080/01621459.1988.10478722

MacNeil, S. (2005). Dyadic assessment of sexual self-disclosure and sexual satisfaction in heterosexual dating couples. *22*, 169-181. doi: 10.1177/0265407505050942

MacNeil, S., & Byers, E. S. (2009). Role of sexual self-disclosure in the sexual satisfaction of long-term heterosexual couples. *Journal of Sex Research, 46*, 3-14. doi: 10.1080/00224490802398399

Manne, S., & Badr, H. (2008). Intimacy and relationship processes in couples' psychosocial adaptation to cancer. *Cancer, 112*, 2541-2555. doi: 10.1002/cncr.23450

Mark, K. P., & Jozkowski, K. N. (2013). The mediating role of sexual and nonsexual communication between relationship and sexual satisfaction in a sample of college-age heterosexual couples. *Journal of Sex & Marital Therapy, 39*, 410-427. doi: 10.1080/0092623X.2011.644652

Marriott, C., & Thompson, A. R. (2008). Managing threats to femininity: Personal and interpersonal experience of living with vulval pain. *Psychology & Health, 23*, 243-258. doi: 10.1080/14768320601168185

Masheb, R. M., Lozano-Blanco, C., Kohorn, E. I., Minkin, M. J., & Kerns, R. D. (2004). Assessing sexual function and dyspareunia with the female sexual function index (FSFI) in women with vulvodynia. *Journal of Sex & Marital Therapy, 30*, 315-324. doi: 10.1080/00926230490463264

Montesi, J. L., Fauber, R. L., Gordon, E. A., & Heimberg, R. G. (2011). The specific importance of communicating about sex to couples' sexual and overall relationship satisfaction. *Journal of Social and Personal Relationships, 28*, 591-609. doi: 10.1177/0265407510386833

Muthén, L. K., & Muthén, B. O. (2014). *Mplus User's Guide*. Los Angeles, CA: Muthén & Muthén.

Nylanderlundqvist, E., & Bergdahl, J. (2003). Vulvar vestibulitis: Evidence of depression and state anxiety in patients and partners. *Acta Dermato-venereologica, 83*(5), 369-373.

Pazmany, E., Bergeron, S., Verhaeghe, J., Van Oudenhove, L., & Enzlin, P. (2014). Sexual communication, dyadic adjustment, and psychosexual well-being in premenopausal women with self-reported dyspareunia and their partners: A controlled study. *The Journal of Sexual Medicine, 11*, 1786-1797. doi: 10.1111/jsm.12518

Pazmany, E., Bergeron, S., Verhaeghe, J., Van Oudenhove, L., & Enzlin, P. (2015). Dyadic sexual communication in pre-menopausal women with self-reported dyspareunia and their partners: Associations with sexual function, sexual distress and dyadic adjustment. *The Journal of Sexual Medicine, 12*, 516-528. doi: 10.1111/jsm.12787

Reed, R. G., Butler, E. A., & Kenny, D. A. (2013). Dyadic models for the study of health. *Social and Personality Psychology Compass, 7*, 228-245. doi: 10.1111/spc3.12022

Rehman, U. S., Rellini, A. H., & Fallis, E. (2011). The importance of sexual self-disclosure to sexual satisfaction and functioning in committed relationships. *The Journal of Sexual Medicine, 8*, 3108-3115. doi: 10.1111/j.1743-6109.2011.02439.x

Rosen, N. O., Bergeron, S., Glowacka, M., Delisle, I., & Baxter, M.-L. (2012). Harmful or helpful: Perceived solicitous and facilitative partner responses are differentially associated with pain and sexual satisfaction in women with provoked vestibulodynia. *The Journal of Sexual Medicine, 9*, 2351-2360. doi: 10.1111/j.1743-6109.2012.02851.x

Rosen, N. O., Bergeron, S., Leclerc, B., Lambert, B., & Steben, M. (2010). Woman and partner-perceived partner responses predict pain and sexual satisfaction in provoked vestibulodynia (PVD) couples. *The Journal of Sexual Medicine, 7*, 3715-3724. doi: 10.1111/j.1743-6109.2010.01957.x

Rosen, N. O., Bergeron, S., Sadikaj, G., Glowacka, M., Baxter, M.-L., & Delisle, I. (2014a). Relationship satisfaction moderates the associations between male partner responses and depression in women with vulvodynia: A dyadic daily experience study. *PAIN, 155*, 1374-1383. doi: 10.1016/j.pain.2014.04.017

Rosen, N. O., Bergeron, S., Sadikaj, G., Glowacka, M., Delisle, I., & Baxter, M.-L. (2014b). Impact of male partner responses on sexual function in women with vulvodynia and their partners: A dyadic daily experience study. *Health Psychology, 33*, 823-831. doi: 10.1037/a0034550

Rosen, N. O., Rancourt, K. M., Corsini-Munt, S., & Bergeron, S. (2014c). Beyond a "woman's problem": The role of relationship processes in female genital pain. *Current Sexual Health Reports, 6*, 1-10. doi: 10.1007/s11930-013-0006-2

Rosen, R. C., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., . . . D'Agostino, R. (2000). The female sexual function index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex & Marital Therapy, 26*, 191-208. doi: 10.1080/009262300278597

Rosen, R. C., Riley, A., Wagner, G., Osterloh, I. H., Kirkpatrick, J., & Mishra, A. (1997). The international index of erectile function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology, 49*, 822-830. doi: 10.1016/S0090-4295(97)00238-0

Scheffer, J. (2002). Dealing with missing data. *Research Letters in the Information and Mathematical Sciences, 3*, 153-160.

Schover, L. R., Youngs, D. D., & Cannata, R. (1992). Psychosexual aspects of the evaluation and management of vulvar vestibulitis. *American Journal of Obstetrics and Gynecology, 167*, 630-636. doi: 10.1016/S0002-9378(11)91562-2

Sheppard, C., Hallam-Jones, R., & Wylie, K. (2008). Why have you both come? Emotional, relationship, sexual and social issues raised by heterosexual couples seeking sexual therapy (in women referred to a sexual difficulties clinic with a history of vulval pain). *Sexual and Relationship Therapy, 23*, 217-226. doi: 10.1080/14681990802227974

Smith, K. B., & Pukall, C. F. (2011). A systematic review of relationship adjustment and sexual satisfaction among women with provoked vestibulodynia. *The Journal of Sex Research, 48*, 166-191. doi: 10.1080/00224499.2011.555016

Smith, K. B., & Pukall, C. F. (2014). Sexual function, relationship adjustment, and the relational impact of pain in male partners of women with provoked vulvar pain. *The Journal of Sexual Medicine, 11*, 1283-1293. doi: 10.1111/jsm.12484

Wiegel, M., Meston, C., & Rosen, R. C. (2005). The female sexual function index (FSFI): Cross-validation and development of clinical cutoff scores. *Journal of Sex & Marital Therapy, 31*, 1-20. doi: 10.1080/00926230590475206

CHAPTER 3: EXTENDING THE MEASUREMENT OF SEXUAL COMMUNICATION IN PVD

The results of study 1 demonstrated the broad role of dyadic sexual communication in couples' adjustment to PVD, showing that women's and partners' perceptions of dyadic sexual communication were associated with physical, psychological, and sexual outcomes. When women and partners perceived greater dyadic sexual communication, they also reported higher sexual satisfaction and functioning, and lower depressive symptoms; when partners perceived greater dyadic sexual communication, women also reported lower pain and greater sexual satisfaction.

Dyadic sexual communication reflects individuals' perceptions of their communication with their partner about sexual matters (Catania, 2011). It comprises satisfaction with communication, ease of discussion, difficulties with sexual communication, and perceived negative responses from partners when discussing sexual topics. Given the broad focus of this variable, researchers have considered it a measure of the overall quality of sexual communication in a relationship (Pazmany et al., 2015). In the context of PVD, where sexuality typically becomes a source of distress or conflict, a more nuanced understanding of sexual communication may be gained by examining the interactional patterns that occur between partners regarding their sexual problems.

To my knowledge, no existing questionnaire measures sexual communication patterns. Thus, I adapted a widely-used and well-validated measure of couples' communication patterns for general relationship problems – the Communication Patterns Questionnaire (CPQ; (Christensen & Sullaway, 1984; Crenshaw et al., in press) – so that items reflected patterns of communication concerning problems that arise in the sexual

relationship. The original version of this measure, named the Sexual Communication Patterns Questionnaire (S-CPQ), included 23 items that asked participants to indicate how likely it was, on a Likert-type scale from 1 ('very unlikely') to 9 ('very likely'), that they and their partner use particular patterns of communication when discussing problems in their sexual relationship (Appendix A). Based on the original CPQ, eleven items reflected mutual communication patterns (i.e., when both partners engage in the same behaviour) and 12 items reflected non-mutual communication patterns (i.e., when each partner engages in a different behaviour) measured from the perspective of both partners (e.g., you nag and your partner withdraws; your partner nags and you withdraw). These items also reflected different time points relevant to couples' communication about sexual problems, including when problems first arise (4 items), during discussions of problems (10 items), and after discussions of problems (9 items).

As the S-CPQ is an adapted measure, an exploratory factor analysis was conducted prior to using the measure in couples coping with PVD. In a larger study approved by the Dalhousie University Human Research Ethics Board, a sample of community participants was recruited via Amazon's Mechanical Turk, an online recruitment platform (Buhrmester, Kwang, & Gosling, 2011; Mason & Suri, 2012). Eligible participants were English-speaking residents of the United States who were between 18 and 45 years of age, in a committed relationship for a minimum of three months, and had engaged in partnered sexual activity in the last four weeks (i.e., non-genital caressing, kissing, manual/oral stimulation, and/or vaginal/anal intercourse with their partner). After providing their informed consent to participate, eligible participants completed the S-CPQ along with other measures required for the larger study. The

sociodemographic characteristics of the final sample of 263 participants are presented in Appendix A, Table 1.

Parallel analysis was used to determine the number of factors to extract in the exploratory factor analysis, as this method is more conservative than the commonly employed Kaiser rule of thumb (i.e., eigenvalue's greater than one) (Russell, 2002). Parallel analysis involved comparing the observed eigenvalues to two critical values (i.e., the mean and 95th percentile) of the expected eigenvalues from factoring a random dataset with the same number of participants and measure items (Fabrigar & Wegener, 2012). The parallel analysis recommended the extraction of two factors in the factor analysis, with observed eigenvalues of 10.11 and 2.49, respectively. The first five eigenvalues are presented in Table 2 in Appendix A.

An exploratory factor analysis was then conducted using Principal Axis Factoring (PAF) with a Promax oblique rotation, which allowed the two extracted factors to correlate. The factor loadings and individual items on the S-CPQ are displayed in Appendix A, Table 3. One item (#1) cross-loaded on both factors (factor loading > .32; (Tabachnick & Fidell, 2007) and was removed from subsequent analyses. The final version of the S-CPQ consisted of 22 items. The PAF suggested the use of two subscales for the S-CPQ. The first subscale was labelled 'negative sexual communication patterns' (Negative SCP) because items reflected a negative process occurring in the interaction between partners. In particular, these items represented communication behaviours of negative valence (Woodin, 2011). These items included both negative approach (e.g., criticizing, pressuring, threatening) and avoidance (e.g., withdrawing, avoiding) communication behaviours on the part of one or both members of the couple. The second

subscale was labelled ‘collaborative sexual communication patterns’ (Collaborative SCP) because items reflected a process of collaboration occurring between partners. In particular, these items represented communication behaviours of positive valence (Woodin, 2011). These items were oriented toward disclosure and problem-solving, such as expressing feelings and discussing solutions. The subscales for the S-CPQ showed good-to-excellent internal consistency within this sample (Negative SCP: α =0.93; Collaborative SCP: α = 0.89), and were moderately, negatively correlated, r = -0.51, p < .001.

The results of the PFA indicated a two-factor structure for the S-CPQ within a community sample of women and men. The results support the use of two subscales to measure SCP – one representing collaborative approaches to the discussion of sexual problems, and the other representing negative approaches. This measure allows for an expansion of the construct of sexual communication, with relevance to couples experiencing problems in the sexual relationship, as is often the case for couples coping with PVD. The purpose of study 2 was to examine whether collaborative and negative SCP were differentially associated with the biopsychosocial adjustment of women with PVD and their partners.

CHAPTER 4: IT TAKES TWO: SEXUAL COMMUNICATION PATTERNS AND THE SEXUAL AND RELATIONAL ADJUSTMENT OF COUPLES COPING WITH PROVOKED VESTIBULODYNIA

The manuscript prepared for this study is presented below. Readers are advised that Kate Rancourt, under the supervision of Dr. Natalie Rosen, was responsible for devising the research questions and hypotheses, and preparing the datasets for analyses. She led the data analysis and interpretation, with the support of her co-authors. Kate wrote the initial draft of the manuscript, with the exception of minor initial contributions from an honours student under her supervision (co-author: Michelle Flynn). Kate received and incorporated the feedback from her co-authors. The manuscript underwent peer-review, and required two revisions. Kate led the response to each revision prior to the manuscript's acceptance in the *Journal of Sexual Medicine* on January 11, 2017. The full reference for this manuscript is:

Rancourt, K.M., Flynn, M., Bergeron, S., & Rosen, N.O. (2017). It takes two: Sexual communication patterns and the sexual and relational adjustment of couples coping with provoked vestibulodynia. *Journal of Sexual Medicine*, 14, 434-443. doi: 10.1016/j.jsxm.2017.01.009

4.1 Abstract

Introduction: Provoked vestibulodynia (PVD) is a prevalent vulvovaginal pain condition that is associated with sexual and relational consequences for women and their partners. Greater perceived quality of sexual communication has been associated with women's lower pain during intercourse, and couples' better sexual and relational well-being. Whether couples' collaborative (e.g., expressing feelings, problem-solving) and negative (e.g., withdrawing or criticizing) sexual communication patterns (SCP) are differentially associated with couples' adjustment to PVD is unknown. *Aim*: This study examined associations between collaborative and negative SCP and women's pain, as well as the sexual and relationship adjustment of women with PVD and their partners. *Methods*: Women diagnosed with PVD ($N = 87$) and their partners completed the Sexual Communication Patterns Questionnaire, and measures of pain (women only), sexual functioning, sexual satisfaction, sexual distress, and relationship satisfaction. *Main Outcome Measures:* (1) Numerical Rating Scale of pain during intercourse; (2) Female Sexual Function Index and International Index of Erectile Function; (3) Global Measure of Sexual Satisfaction; (4) Female Sexual Distress Scale – Revised; (5) Couple Satisfaction Index. *Results*: When women reported greater collaborative SCP, they also reported higher sexual and relationship satisfaction. When women reported greater negative SCP, they reported less relationship satisfaction and had partners who reported greater sexual distress. When partners reported greater collaborative SCP, they also reported higher relationship satisfaction and had female partners who were less sexually distressed. When partners reported higher negative SCP, they also reported less relationship satisfaction. There were no associations between SCP and women's or

partners' sexual functioning, nor women's pain. *Conclusions*: Collaborative SCP may benefit couples' sexual and relational well-being, whereas negative SCP may impede sexual and relational adjustment to PVD. Findings provide preliminary support for the need to assess and target both collaborative and negative SCP in psychological interventions for couples affected by PVD.

4.2 Introduction

Provoked vestibulodynia (PVD) – a subtype of vulvodynia wherein women experience pain when pressure is applied to the vulvar vestibule – is a prevalent vulvovaginal pain condition affecting 7 to 12% of women in the general population (Harlow et al., 2014; Harlow & Stewart, 2003). Recent formulations support a biopsychosocial conceptualization of the etiology and maintenance of PVD (Pukall et al., 2016). Although the pain may be elicited in nonsexual contexts (e.g., gynecological exams), for most women, partnered sexual activity (e.g., vaginal penetration) is the most functionally impairing context in which PVD is triggered, pointing to the inherently interpersonal nature of this pain. Controlled studies indicate that PVD has consequences for both affected women and their partners, including reduced sexual functioning and satisfaction, and increased sexual distress (Pazmany et al., 2014; Smith & Pukall, 2011, 2014). Moreover, affected couples also experience reduced relationship satisfaction or distress over the perceived impact of PVD on the relationship (Ayling & Ussher, 2008; N. O. Rosen, Rancourt, et al., 2014; Smith & Pukall, 2014) (but also see (Smith & Pukall, 2011).

Given that sexual dysfunctions are typically experienced within the context of relationships, (Dewitte, 2014) proposed that it is necessary to evaluate both individual and relational factors that influence couples' sexual relationships. Increasingly, studies of couples coping with PVD have highlighted the range of interpersonal factors, including both positive and negative aspects of couple interactions, that facilitate or interfere with couples' overall adjustment (N. O. Rosen, Rancourt, et al., 2014). For example, facilitative partner responses to pain (i.e., encouraging adaptive coping) have been linked

to women's lower pain and couples' more favourable sexual outcomes, whereas solicitous (e.g., expressing sympathy) and negative (e.g., expressing hostility) responses were associated with poorer outcomes (N. O. Rosen et al., 2012; N. O. Rosen, Bergeron, Sadikaj, Glowacka, Delisle, et al., 2014). 'Sexual communication patterns' are another relevant relational factor that may improve couples' adjustment to PVD, but that have received little empirical attention. The present study investigated associations between couples' collaborative and negative sexual communication patterns and women's pain, and couples' sexual and relational adjustment to PVD.

Open sexual communication is positively related to sexual function and sexual and relationship satisfaction (MacNeil & Byers, 2009; Montesi et al., 2011; Rehman, Rellini, et al., 2011). Yet, sexual topics are rated as one of the most difficult topics for couples to discuss (Sanford, 2003), and may be more challenging in the presence of a sexual dysfunction. Indeed, controlled and uncontrolled studies show that women and partners affected by vulvovaginal pain report poor quality and inhibited sexual communication (Jelovsek et al., 2008; Pazmany et al., 2014; Smith & Pukall, 2014). An empirically supported theory of sexual communication suggests that it may contribute to more favourable sexual outcomes by facilitating couples' practice of mutually satisfying sexual behaviours (*'instrumental pathway'*), and by promoting intimacy between partners ('*expressive pathway'*) (MacNeil & Byers, 2005, 2009). In PVD, sexual communication via these two pathways might also encourage modified pain coping, such as generating greater emotional responsivity between partners about PVD (Cano & Williams, 2010), or reducing the focus on penetrative sexual activities that trigger pain. Recently, two dyadic studies in vulvovaginal pain samples demonstrated that when women reported greater

dyadic sexual communication, they also reported better sexual functioning and satisfaction, lower sexual distress, and higher relationship satisfaction. When male partners reported greater dyadic sexual communication, they also reported better sexual functioning and sexual satisfaction, and had female partners who were more sexually satisfied and reported less pain during intercourse (Pazmany et al., 2015; Rancourt et al., 2016).

Prior research on sexual communication in couples affected by PVD has focused on their subjective evaluations of the quality of their sexual communication (Pazmany et al., 2014, 2015; Rancourt et al., 2016; Smith & Pukall, 2014). However, little is known about what the conversations look like when women and partners discuss the problems that inevitably arise in their sexual relationship (e.g., the behaviors or reactions of each partner). Empirically-supported theories of marital communication indicate that how couples engage with one another about relationship problems – i.e., their communication patterns – are related to their relationship outcomes (Gottman & Krokoff, 1989; Litzinger & Gordon, 2005; Manne et al., 2006; Perrone-McGovern et al., 2014; Schrodt et al., 2013). In particular, communication patterns involving collaborative engagement between partners (e.g., openly discussing problems, expressing understanding, exploring compromises) predict beneficial relationship and sexual outcomes in community samples and in couples coping with breast or prostate cancer (Litzinger & Gordon, 2005; Manne et al., 2006; Perrone-McGovern et al., 2014). In contrast, communication patterns reflecting either negative engagement or a lack of engagement between partners (e.g., expressed anger, making demands, withdrawal, criticism, defensiveness) are associated

with poorer relationship outcomes (Gottman & Krokoff, 1989; Manne et al., 2006; Schrodt et al., 2013), although this is not always the case (Gottman & Krokoff, 1989).

While researchers have recognized that communication patterns may play an important role in couples' sexual relationships (Dewitte, 2014), to our knowledge, communication patterns have not previously been examined in couples coping with a sexual dysfunction such as PVD. Examining sexual communication patterns (SCP) among couples coping with PVD may help identify whether the ways couples engage in conversations about their sexual problems facilitate or hinder their adjustment to PVD.

Aims

Using a dyadic, cross-sectional design, we examined associations between women's and partners' perceptions of their collaborative and negative SCP and women's pain intensity, as well as both partners' sexual functioning, sexual satisfaction, sexual distress, and relationship satisfaction. We hypothesized that women's and partners' higher collaborative SCP and lower negative SCP would be associated with women's lower pain intensity, as well as the woman's own and their partners' better sexual functioning, sexual satisfaction, and relationship satisfaction, and lower sexual distress.

4.3 Method

4.3.1 Participants

Eighty-seven women with PVD and their partners participated in this study. Couples were recruited between April 2014 and April 2016 to participate in a two-city treatment study. Eligible couples were at least 18 years of age, in a committed, monogamous relationship for at least six months, were cohabiting or had at least four in-person contacts a week, and attempted vaginal penetration with one another at least once

per month for the past three months (the latter being a necessary criterion for the treatment study (Corsini-Munt, Bergeron, Rosen, Steben, et al., 2014) in which pain during intercourse is the primary outcome measure). In addition, the following inclusion criteria applied for women experiencing pain: younger than 45 years of age (due to vulvar changes that occur in the perimenopausal period) (Mitchell et al., 2013); minimum pain duration of one year on 80% of penetration attempts; pain triggered when pressure is applied to the vulvar vestibule (e.g., intercourse, tampon insertion); a diagnosis of PVD from a collaborating gynecologist using a standardized cotton-swab test (i.e., women's self-reported pain upon randomized palpation, using a cotton swab, of the vulvar vestibule at 3, 6, and 9 o'clock) (Bergeron, Binik, Khalife, Pagidas, & Glazer, 2001). Exclusion criteria were: presence of an active vaginal infection or dermatological condition; currently pregnant or planning a pregnancy; currently receiving treatment for PVD; and diagnosis of a major medical or psychiatric illness.

Two-hundred and seventy-nine women were screened for eligibility via the following recruitment sources: local (n = 112; 40.1%) or online advertisements (n = 53; 19.0%), health care provider referrals (n = 16; 5.7%), collaborating gynecologists (n = 31; 11.1%), prior participation in our research studies (n = 52; 18.6%), and other or unknown sources (n = 15; 5.4%). One-hundred and eighty-six women (66.7%) were ineligible for the following reasons: partner ineligible/not interested (n = 20; 10.8%), did not meet PVD or pain criteria (n = 47; 25.3%), ineligible relationship status (n = 53; 28.5%), ineligible age (n = 22; 11.8%), pursuing PVD treatment (n = 28; 15.1%), pregnant, planning a pregnancy, or recently gave birth (n = 10; 5.3%), and other reasons (n = 6; 3.2%). Six women were no longer interested in participating after being screened.

Six women (6.9% of final sample) did not attend their gynecological examination appointment, but were included in this study given the excellent reliability and validity of self-reported symptoms for predicting vulvodynia diagnoses (B. D. Reed, Haefner, Harlow, Gorenflo, & Sen, 2006). Of the final sample of 87 couples, 62% were from study site one, and 38% were from study site two.

4.3.2 Procedure

Each institution's research ethics board approved the larger treatment study. All study procedures were consistent between the two study sites. Interested participants were screened for eligibility over the phone, and were asked to confirm their partners' interest in the study. Couples attended an appointment with a research assistant where they provided their informed consent, took part in a brief structured interview to collect sociodemographic information, and completed online self-report measures on separate computers. This appointment constituted the baseline assessment before couples were enrolled in the treatment study. Couples were compensated $30 for their time. Women attended a gynecological assessment with a collaborating gynecologist to confirm the diagnosis of PVD.

4.3.3 Measures

Sexual Communication Patterns (SCP). The 22-item Sexual Communication Patterns Questionnaire (S-CPQ) was used to measure participants' self-reported patterns of sexual communication. The S-CPQ was adapted from the 35-item Communication Patterns Questionnaire (Christensen & Sullaway, 1984), which measures communication patterns concerning relationship conflicts. A subset of items from the original measure that were deemed relevant for sexual communication in a PVD sample were selected for

the S-CPQ. The S-CPQ assesses participants' perceptions of how they and their partner communicate about problems affecting their sexual relationship. Participants rate the likelihood of using each communication pattern on a 9-point Likert-type scale ('very unlikely' to 'very likely'). We validated the factor structure of the S-CPQ in an independent online sample of sexually active men and women in relationships (Rancourt & Rosen, 2016). Exploratory factor analysis revealed a two-factor structure; these factors were labeled "collaborative" and "negative" SCP. The collaborative SCP subscale consisted of 8 items representing collaboration between members of the couple in their discussion or resolution of the sexual problem (e.g., both members express their feelings to one another). The negative SCP subscale consisted of 14 items representing the expression of high negative affect by one or both members of the couple (e.g., both members blame, criticize, or accuse each other). The collaborative and negative subscales demonstrated excellent internal consistency in the validation sample (α = 0.89 and 0.93, respectively). Total summed subscale scores range from 8 to 72 for the collaborative SCP subscale, and from 14 to 126 for the negative SCP subscale, with higher scores indicating greater likelihood of using these patterns of sexual communication. The internal consistency for each subscale in the current sample can be found in Table 4.7.2, along with the internal consistencies of all outcome measures.

Main Outcome Measures

Pain. Women with PVD rated their average pain intensity during intercourse over the past six months using a 0 (no pain) to 10 (worst pain ever) numerical rating scale (NRS). The NRS is a recommended scale for assessing clinical pain intensity, and has

demonstrated convergent validity with other clinical self-report measures of pain (Hjermstad et al., 2011).

Sexual Function. The Female Sexual Function Index (FSFI; (R. C. Rosen et al., 2000) is a well-validated, 19-item measure that evaluates women's sexual functioning over the past four weeks according to six domains: desire, arousal, lubrication, orgasm, satisfaction, and pain. FSFI total scores range from 2 to 36, with higher scores signifying better sexual function. The International Index of Erectile Function [IIEF; (R. C. Rosen et al., 1997) is a well-validated 15-item measure that evaluates men's sexual functioning over the past four weeks according to five domains: erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction . Summed total scores range from 5 to 75, with higher scores indicating better sexual function. Only women and men who were sexually active within the preceding four weeks were included in analyses using the FSFI and IIEF (Meyer-Bahlburg & Dolezal, 2007).

Sexual Satisfaction. The Global Measure of Sexual Satisfaction (GMSEX; (Lawrance & Byers, 1995)) is a well-validated measure that assesses individuals' subjective evaluation of the positive and negative qualities of their sexual relationship (Mark, Herbenick, Fortenberry, Sanders, & Reece, 2014). The GMSEX consists of five items rated on a 7-point Likert scale, where the scale anchors represent bipolar adjectives (e.g., good-bad, satisfying-unsatisfying). Summed total scores range from 5 to 35, with higher scores representing greater sexual satisfaction.

Sexual Distress. The Female Sexual Distress Scale-Revised (FSDS-R; (Derogatis, Clayton, Lewis-D'Agostino, Wunderlich, & Fu, 2008)) was used to assess participants' subjective distress associated with their sexual functioning. This measure was originally

developed for women; however, as all items are gender non-specific, researchers have previously adapted this measure to assess both women's and men's sexual distress (Bois et al., 2016). The FSDS-R consists of 13-items measured on a 5-point scale from 0 (never) to 4 (always). Total summed scores range from 0 to 48, with higher scores indicating greater sexual distress. The FSDS-R is well-validated in women with sexual dysfunction (Derogatis et al., 2008), and demonstrates good internal consistency in romantic partners affected by vulvodynia (Bois et al., 2016).

Relationship Satisfaction. The 32-item Couples Satisfaction Index (CSI; (Funk & Rogge, 2007)) was used to measure participants' relationship satisfaction. Summed total scores range from 0 to 161, with higher scores representing higher satisfaction. The CSI demonstrates strong psychometric properties relative to other established measures of relationship satisfaction (Funk & Rogge, 2007).

4.3.4 Data Analytic Strategy

Given the small amount of missing data (<2.50% at the item-level), and that data were missing completely at random (Little's MCAR test, $\chi^2(893) = .00$, $p = 1.00$) (Little, 1988), expectation maximization was used to impute missing data at the item-level (Scheffer, 2002) for all measures except the FSFI and IIEF. Differences in sociodemographic, predictor, and outcome variables between study sites were examined using Multivariate Analysis of Variance (MANOVA) for continuous variables and χ^2 tests for categorical variables. Intercorrelations among study variables and continuous sociodemographic variables were examined using Pearson's correlations. Multilevel modeling guided by the Actor-Partner Interdependence Model (APIM) was used to examine the dyadic effects of women's and partners' collaborative and negative SCP on

outcome variables for both women and partners. Couple data were represented within a two-level model, where individuals' data (Level 1) were nested within dyads (Level 2). This data structure accounts for the non-independence of dyadic data (Kenny et al., 2006). Applying the APIM, it is possible to examine 'actor effects' (i.e., the effect of participants own SCP on their own outcomes, while controlling for the partner's SCP) and 'partner effects' (i.e., the effect of participants partners' SCP on participants own outcomes, while controlling for their own SCP). Four separate APIMs were modeled for each outcome variable, with women's and partners' collaborative and negative SCP entered as predictor variables. Predictors were grand-mean centered prior to conducting the analyses (Kenny et al., 2006). Intraclass correlation coefficients (ICCs) were calculated to estimate the degree of correlation in collaborative and negative SCP within couples; ICCs represent the proportion of total variance that can be explained at the between-couple level versus the within-couple level (Kenny et al., 2006). Given measurement differences for sexual function (FSFI vs. IIEF), sexual functioning scores were standardized (using z-scores) to allow for an APIM to be modeled on sexual functioning. All analyses were conducted in SPSS version 22.0.

4.4 Results

Sample characteristics and bivariate correlations

Descriptive statistics for the sociodemographic characteristics and predictor and outcome variables of this sample are presented in Tables 4.7.1 and 4.7.2. There was a significant multivariate main effect of study site on women's (Wilks' $\lambda = .76$, $F(7,70) = 3.13$, $p < .01$) and partners' outcome variables (Wilks' $\lambda = .82$, $F(6,65) = 2.39$, $p < .05$); hence we controlled for study site in all primary analyses. Women's and partners' age

were significantly negatively correlated with their own and their partners' relationship and sexual satisfaction (r = -.21 to -.27, p < .05). Consequently, we conducted APIMs including age as a covariate in the models for sexual and relationship satisfaction. For relationship satisfaction, the pattern and significance of the results remained the same as the model controlling only for site. As such, the most parsimonious model is reported below for relationship satisfaction, while the model for sexual satisfaction included both site and age as covariates. The distribution of scores on negative SCP was positively skewed, and as such, we also conducted the APIM analyses after employing a transformation to this variable. After the transformation, the pattern and significance of the results for all APIM models remained the same, with the exception of one effect[1]; thus, the non-transformed data are presented below for simplification of reporting and interpretation.

Table 4.7.3 provides the correlations among predictor and outcome variables. Women's and partners' SCP were not significantly correlated with women's pain intensity; consequently, no further analyses were conducted with women's pain. Not presented in Table 4.7.3, women's collaborative SCP were moderately, negatively correlated with their own negative SCP (r = -.27, p < .05), and weakly, negatively correlated with partners' negative SCP (r = -.19, p = .07). A similar pattern was found between partners' collaborative SCP and both their own negative SCP (r = -.33, p < .01) and women's negative SCP (r = -.13, p = .23). In this sample, 76% of the variance in

[1] After a square root transformation of the negative SCP subscale, the significance of the partner effect for women's greater negative SCP on partners' higher sexual distress was reduced to a trend (p = .057).

collaborative SCP, and 65% in negative SCP, was due to within-couple factors (ICC = .24 and .35, respectively), indicating that there was a higher degree of variability in reports of SCP within than between couples.

Associations between SCP and sexual and relationship outcomes

Table 4.7.4 shows the actor and partner effects for the APIMs conducted with each independent outcome variable, controlling for study site. There were no significant effects of women's or partners' collaborative and negative SCP on women's or partners' sexual functioning. Regarding sexual satisfaction, when controlling for age (in addition to study site), analyses revealed that when women reported greater collaborative SCP, they also reported higher sexual satisfaction; a similar effect was seen for partners, though it did not reach statistical significance ($p < .07$). Individuals' collaborative SCP were not significantly associated with their partners' sexual satisfaction, and individuals' negative SCP were not associated with their own, nor their partners' sexual satisfaction. Regarding sexual distress, when partners reported higher collaborative SCP, women reported significantly lower sexual distress. Additionally, when women reported greater negative SCP, partners reported significantly higher sexual distress. There were no significant effects of women's collaborative SCP on their own or partners' sexual distress, women's negative SCP on their own sexual distress, and partners' negative SCP on their own or women's sexual distress.

Regarding relationship satisfaction, when women and partners reported greater collaborative SCP, they also reported significantly higher relationship satisfaction. In contrast, when individuals (i.e., women and partners) reported greater negative SCP, they also reported significantly lower relationship satisfaction. We were unable to demonstrate

significant effects of individuals' collaborative or negative SCP on their partners' relationship satisfaction.

4.5 Discussion

This study examined the dyadic associations between women's and partners' collaborative and negative sexual communication patterns (SCP) and their sexual and relational adjustment to PVD. Results suggested that when problems arise in the sexual relationship, collaborative SCP (e.g., expressing feelings, problem solving) were generally associated with beneficial effects for couples' sexual and relational adjustment to PVD, whereas negative SCP (e.g., one or both partners criticizing, defending, or withdrawing) were associated with unfavorable outcomes. Findings are consistent with existing literature in couples' coping with vulvovaginal pain, which found that a higher perceived quality of dyadic sexual communication was associated with better sexual and relational adjustment (Pazmany et al., 2015; Rancourt et al., 2016).

When women with PVD perceived that they and their partners engaged in greater collaborative communication about sexual problems, they also reported higher sexual satisfaction; this effect was not statistically significant for partners when controlling for study site and age. Moreover, for both women and partners, when they reported greater collaborative *and* lower negative SCP, they also reported higher relationship satisfaction. Applying current models of sexual communication (MacNeil & Byers, 2009), when women perceive greater collaborative SCP, this may reflect couples' attempts to address the sexual restrictions they face as a result of the pain – for example, by shifting focus away from painful sexual activities and toward pleasurable ones (i.e., the instrumental pathway), thereby contributing to women's greater sexual satisfaction. In addition, both

partners' relationship satisfaction may be enhanced by engendering a sense of efficacy that they are coping with a significant relational stressor together as a couple (Connor, Robinson, & Wieling, 2008). Through the expressive pathway, when women and partners perceive more collaborative SCP, it may facilitate the development of intimacy and cohesion through increased emotional disclosure and validation (MacNeil & Byers, 2005, 2009). In prior studies of couples where one person has chronic pain or vulvodynia, greater emotional disclosure and empathic response have been associated with both partners' greater sexual and relationship satisfaction (Bois et al., 2016; Bois et al., 2013; Cano, Barterian, & Heller, 2008).

Conversely, extending the instrumental and expressive pathways to negative SCP, couples' perceived patterns of expressed negativity (e.g., withdrawing, criticizing, or defending) may contribute to individuals' lower relationship satisfaction by interfering with their ability to effectively address a source of strain on the relationship (i.e., PVD), or by contributing to a climate of low relational intimacy and increasing polarization. Thus, negative approaches to sexual communication on the part of one or both partners may convey a lack of empathy about the toll that PVD or related sexual problems can take on the relationship. Non-empathic responding has been associated with lower relationship satisfaction in individuals affected by chronic pain and their partners (Cano et al., 2008). Similar findings have been noted in a community sample of couples' discussing sexual problems, where observed negative communication behaviors (e.g., blame) were related to women's lower relationship satisfaction (Rehman, Janssen, et al., 2011).

When partners reported higher collaborative SCP, women reported lower sexual distress (psychological distress over one's own sexual functioning) (Derogatis et al., 2008). Women with PVD are the 'identified patient' when presenting for treatment, and report feeling guilt and shame over the impact of PVD on their sexual relationships (Ayling & Ussher, 2008). When partners report that they communicate collaboratively about sexual problems, this perception may reflect partners' greater engagement in a shared effort to cope with the PVD (Berg & Upchurch, 2007), and may increase their ability to empathically respond to women's experiences of PVD (Bois et al., 2016; Cano et al., 2008). In this way, partners' reported collaborative approaches to sexual communication may lessen women's sexual distress. Conversely, when women reported more negative SCP, their partners reported greater sexual distress. Qualitative research has found that partners' distress in the context of PVD frequently takes the form of confusion, guilt, rejection, or resentment (Connor et al., 2008). Thus, when women perceive a high degree of expressed negativity in their sexual communication, this may interfere with women's capacity to understand and validate their partners' experience of PVD, including its impact on partners' sexuality, thereby leading to partners' greater sexual distress.

SCPs, as reported by both women with PVD and their partners, were unrelated to women's pain intensity during intercourse, and sexual functioning for both members of the couple. It is possible that individuals' evaluations of communication processes are more strongly related to subjective interpersonal outcomes (e.g., satisfaction and distress) than to intrapersonal measures of pain or sexual functioning. This interpretation is consistent with other studies in couples affected by PVD (Bois et al., 2013; N. O. Rosen,

Muise, Bergeron, Impett, & Boudreau, 2015) (but see also Pazmany et al., 2015; Rancourt et al., 2016). It may be premature to draw conclusions about the associations between sexual communication and pain and sexual functioning, particularly given the cross-sectional designs used in this and prior research.

Overall, some preliminary patterns emerged in the results. In this sample, individuals' perceptions of SCP related more to their own subjective evaluation of the positive and negative aspects of their sexual and romantic relationships, and to their partners' experience of distress in the sexual relationship. These findings were unexpected given that satisfaction and distress are typically subjective experiences that are moderately to highly negatively correlated (Bois et al., 2016; Stephenson & Meston, 2010). Investigating possible differential mechanisms underlying the associations between sexual communication patterns and women's and partners' sexual and relational outcomes may shed light on these results.

The limitations of a cross-sectional design must be noted, particularly when studying associations among interrelated variables (e.g., distress and communication; (Baucom et al., 2007). For example, sexual distress may also influence the ways that couples engage in and/or perceive their sexual communication. In addition, characteristics of this sample may limit the generalizability of our findings. Couples in this study attempted to engage in penetrative sex at least once per month in the preceding three months, thus these results may not be representative of couples who are unable or unwilling to attempt penetrative sex. Additionally, only two participating couples were in same-sex relationships, which limits our ability to draw conclusions about these associations in same-sex relationships. Moreover, while we controlled for study site in

our analyses, there may have been differences in the types and severity of couples that presented for this study between the two sites (e.g., geographic and sociocultural differences). Finally, women's and partners' reports of SCP were only weakly to moderately correlated, underscoring the need for diverse methodologies (e.g., observational designs) for studying relationship processes, such as sexual communication patterns. As self-report measures can be biased by the subjective experiences of each member of the couple (e.g., emotions such as guilt), multi-method approaches would allow researchers and clinicians to better understand the contributions of both observed and perceived sexual communication dynamics on couples' adjustment to PVD.

Conclusion

Collaborative patterns of sexual communication are associated with couples' greater sexual and relationship well-being, whereas negative communication patterns are associated with poorer outcomes. These findings offer preliminary evidence that psychological interventions for couples with PVD may benefit from enhancing collaborative and reducing negative approaches to sexual communication. Couple interventions rooted in the broader couple therapy literature aim to reduce negative approaches to conflict and increase collaborative approaches (Benson et al., 2012). Recent advances in couple therapy for PVD have also found that couples view communication training as a crucial part of the therapy (Corsini-Munt, Bergeron, Rosen, Mayrand, et al., 2014), though it remains to be tested whether interventions aimed at reducing negative and increasing collaborative communication, specifically as it relates to sex, will result in couples' greater treatment gains.

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4.7 Tables

Table 4.7.1

Descriptive characteristics for the sample (N = 87 couples)

Characteristic	*M* (range) or *N*	*SD* or %
Age (years)		
Women	27.47 (19-44)	6.29
Partners	29.63 (19-56)	7.71
Partners' sex		
Male	85	97.7
Female	2	2.3
Education (years)		
Women	16.91 (11-22)	6.29
Partners	16.41 (10-24)	3.02
Culture		
Women[a]		
English Canadian	26	30.2
French Canadian	37	43.0
Other[b]	23	26.7
Partners		
English Canadian	31	35.6
French Canadian	30	34.5
Other[b]	26	29.9
Couples' annual income[a]		
$0-19,999	12	14.0
$20,000-39,999	19	22.0
$40,000-59,999	12	14.0
$60,000-79,999	14	16.3
$80,000-99,999	9	10.5
>$100,000	20	23.3
Couples' relationship status		
Married	27	31.0
Common law	20	23.0
Living together, not married	23	26.4
Not living together	17	23.0
Couples' relationship length (months)	67.37 (6-252)	52.71
Women's pain duration (months)	81.02 (7-312)	64.63

[a] n = 86; [b] 'Other' includes Asian, Latin American, African, European, Middle Eastern, Caribbean

Note: SD = standard deviation

Table 4.7.2

Scores on predictor and outcome measures for women with PVD and their partners (N = 87 couples)

Variable	*M*	*SD*	Range		α
			Min	Max	
Collaborative Sexual Communication Patterns					
Women	47.59	10.52	14.00	72.00	0.77
Partners	47.60	10.14	17.00	72.00	0.77
Negative Sexual Communication Patterns					
Women	40.01	10.52	14.00	83.00	0.85
Partners	41.23	17.43	14.00	84.00	0.87
Women's pain intensity	6.64	1.80	1.40	10.00	--
Sexual functioning					
Women with PVD (FSFI)[a]	19.18	5.33	6.60	28.40	0.90
Female partners (FSFI)[b]	29.30	2.19	29.30	32.40	--
Male partners (IIEF)[c]	59.47	7.24	43.00	73.00	0.77
Sexual satisfaction					
Women[d]	21.93	6.73	6.00	35.00	0.90
Partners[d]	25.16	6.52	11.00	35.00	0.89
Sexual Distress					
Women[d]	33.31	9.84	4.00	51.00	0.90
Partners	16.99	10.32	0.00	48.00	0.93
Relationship satisfaction					
Women	125.33	21.42	61.00	160.00	0.96
Partners	124.18	23.89	49.00	159.00	0.97

[a] $n = 78$; [b] $n = 2$ (due to sample size, Cronbach's alpha was not calculated for female partners FSFI scores); [c] $n = 70$; [d] $n = 86$

Note: PVD = provoked vestibulodynia; SD = standard deviation

Table 4.7.3

Correlations among predictor and outcome variables in women with PVD and partners (N = 87)

Measure	1	2	3	4	5	6	7
1. Pain intensity	**--**	**--**	**--**	**--**	**--**	**--**	**--**
2. Sexual functioning[a]	-.272*	**.314****	.577**	-.426**	.283*	.145	-.212
3. Sexual satisfaction[b]	-.020	.695**	**.474****	-.611**	.502**	.299**	-.277**
4. Sexual distress[b]	.276*	-.440**	-.441**	**.328****	-.392**	-.193	.337**
5. Relationship satisfaction	.035	.296**	.359**	-.141	**.411****	.553**	-.538**
6. Collaborative SCP	.026	.193	.322**	-.156	.443**	**.241***	-.328**
7. Negative SCP	.119	-.138	-.193	.255*	-.400**	-.270*	**.355****

Note: Bolded values on the diagonal represent between-partner correlations. Values above the diagonal represent within-person correlations for partners; values below the diagonal represent within-person correlations for women with PVD (provoked vestibulodynia). Correlations for sexual functioning were conducted using standardized scores (i.e., z-scores).
[a] $n = 2$ (Female partners), $n = 72$ (Male partners); [b] $n = 86$
*$p < .05$, **$p < .01$

Table 4.7.4

Associations between collaborative and negative sexual communication patterns (SCP) and outcome variables

Predictor Variable		Outcome Variables							
		Model 1: Sexual Functioning[a]		Model 2: Sexual Satisfaction[b]		Model 3: Sexual Distress		Model 4: Relationship Satisfaction	
		Women	Partners	Women	Partners	Women	Partners	Women	Partners
Study Site	*b* (SE)	0.19 (0.19)		-0.04 (1.20)		**-3.70 (1.66)**		**6.35 (3.17)**	
	t	0.98		-0.04		**-2.23***		**2.01***	
	r	.12		.00		.24		.22	
Women's Collaborative SCP	*b* (SE)	0.01 (0.01)	0.02 (0.01)	**0.15 (0.07)**	0.01 (0.07)	-0.02 (0.10)	0.02 (0.10)	**0.67 (0.20)**	0.22 (0.19)
	t	1.13	1.30	**2.08***	0.21	-0.18	0.19	**3.39****	1.12
	r	.14	.16	.23	.02	.02	.02	.35	.12
Women's Negative SCP	*b* (SE)	-0.00 (0.01)	-0.01 (0.01)	-0.03 (0.04)	-0.05 (0.04)	0.01 (0.06)	**0.13 (0.06)**	**-0.30 (0.12)**	-0.06 (0.12)
	t	-0.41	-1.61	-0.67	-1.29	1.74	**1.99***	**-2.46***	-0.50
	r	.05	.20	.08	.14	.19	.22	.26	.06
Partners' Collaborative SCP	*b* (SE)	-0.00 (0.01)	.00 (0.01)	0.05 (0.07)	0.13 (0.07)	**-0.24 (0.11)**	-0.11 (0.11)	0.09 (0.21)	**0.97 (0.20)**
	t	-0.10	0.65	0.73	1.87	**-2.22***	-0.97	0.43	**4.77****
	r	.01	.08	.08	.21	.24	.11	.05	.47
Partners' Negative SCP	*b* (SE)	-0.01 (0.01)	-0.00 (0.01)	-0.03 (0.05)	-0.05 (0.04)	0.01 (0.07)	0.12 (0.07)	-0.16 (0.13)	**-0.47 (0.12)**
	t	-1.13	-0.57	-0.70	-1.06	0.17	1.72^{+}	-1.28	**-3.80****
	r	.15	.07	.08	.12	.02	.19	.14	.38

*$p < .05$, **$p < .01$; [a] $n = 82$; [b] Controlling for women's and partners' age

b = unstandardized estimates; SE = standard error; *r* = Approximate effect size

Approximate effect sizes were calculated using the formula $r = \sqrt{(t^2/(t^2+df))}$ (see (Overall & Hammond, 2013; Rosenthal & Rosnow, 2007).

Degrees of freedom range from 63.08 to 105.38.

92

4.8 References

Ayling, K., & Ussher, J. M. (2008). "If sex hurts, am I still a woman?" The subjective experience of vulvodynia in hetero-sexual women. *Archives of Sexual Behavior, 37*(2), 294-304. doi:10.1007/s10508-007-9204-1

Baucom, B., Eldridge, K., Jones, J., Sevier, M., Clements, M., Markman, H., . . . Christensen, A. (2007). Relative contributions of relationship distress and depression to communication patterns in couples. *Journal of Social and Clinical Psychology, 26*(6), 689-707. doi:10.1521/jscp.2007.26.6.689

Benson, L. A., McGinn, M. M., & Christensen, A. (2012). Common principles of couple therapy. *Behavior Therapy, 43*(1), 25-35. doi:10.1016/j.beth.2010.12.009

Berg, C. A., & Upchurch, R. (2007). A developmental-contextual model of couples coping with chronic illness across the adult life span. *Psychological Bulletin, 133*(6), 920-954. doi:10.1037/0033-2909.133.6.920

Bergeron, S., Binik, Y. M., Khalife, S., Pagidas, K., & Glazer, H. I. (2001). Vulvar vestibulitis syndrome: Reliability of diagnosis and evaluation of current diagnostic criteria. *Obstetrics & Gynecology, 98*(1), 45-51.

Bois, K., Bergeron, S., Rosen, N., Mayrand, M. H., Brassard, A., & Sadikaj, G. (2016). Intimacy, sexual satisfaction, and sexual distress in vulvodynia couples: An observational study. *Health Psychology, 35*(6), 531-540. doi:10.1037/hea0000289

Bois, K., Bergeron, S., Rosen, N. O., McDuff, P., & Gregoire, C. (2013). Sexual and relationship intimacy among women with provoked vestibulodynia and their partners: Associations with sexual satisfaction, sexual function, and pain self-efficacy. *Journal of Sexual Medicine, 10*(8), 2024-2035. doi:10.1111/jsm.12210

Cano, A., Barterian, J. A., & Heller, J. B. (2008). Empathic and nonempathic interaction in chronic pain couples. *Clinical Journal of Pain, 24*(8), 678-684. doi:10.1097/AJP.0b013e31816753d8

Cano, A., & Williams, A. C. d. C. (2010). Social interaction in pain: reinforcing pain behaviors or building intimacy? *Pain, 149*(1), 9-11. doi:10.1016/j.pain.2009.10.010

Christensen, A., & Sullaway, M. (1984). *Communication Patterns Questionnaire*. Unpublished questionnaire. University of California. Los Angeles.

Connor, J. J., Robinson, B., & Wieling, E. (2008). Vulvar pain: A phenomenological study of couples in search of effective diagnosis and treatment. *Family Process, 47*(2), 139-155.

Corsini-Munt, S., Bergeron, S., Rosen, N. O., Mayrand, M. H., & Delisle, I. (2014). Feasibility and preliminary effectiveness of a novel cognitive-behavioral couple therapy for provoked vestibulodynia: A pilot study. *Journal of Sexual Medicine, 11*(10), 2515-2527. doi:10.1111/jsm.12646

Derogatis, L., Clayton, A., Lewis-D'Agostino, D., Wunderlich, G., & Fu, Y. (2008). Validation of the female sexual distress scale-revised for assessing distress in women with hypoactive sexual desire disorder. *Journal of Sexual Medicine, 5*(2), 357-364. doi:10.1111/j.1743-6109.2007.00672.x

Dewitte, M. (2014). On the interpersonal dynamics of sexuality. *Journal of Sex & Marital Therapy, 40*(3), 209-232. doi:10.1080/0092623X.2012.710181

Funk, J. L., & Rogge, R. D. (2007). Testing the ruler with item response theory: increasing precision of measurement for relationship satisfaction with the Couples Satisfaction Index. *Journal of Family Psychology, 21*(4), 572-583. doi:10.1037/0893-3200.21.4.572

Gottman, J. M., & Krokoff, L. J. (1989). Marital interaction and satisfaction: A longitudinal view. *Journal of Consulting and Clinical Psychology, 57*(1), 47-52.

Harlow, B. L., Kunitz, C. G., Nguyen, R. H., Rydell, S. A., Turner, R. M., & MacLehose, R. F. (2014). Prevalence of symptoms consistent with a diagnosis of vulvodynia: Population-based estimates from 2 geographic regions. *American Journal of Obstetrics & Gynecology, 210*(1), 40 e41-48. doi:10.1016/j.ajog.2013.09.033

Harlow, B. L., & Stewart, E. G. (2003). A population-based assessment of chronic unexplained vulvar pain: have we underestimated the prevalence of vulvodynia? *Journal of the American Medical Womens Association (1972), 58*(2), 82-88.

Hjermstad, M. J., Fayers, P. M., Haugen, D. F., Caraceni, A., Hanks, G. W., Loge, J. H., . . . (EPCRC), E. P. C. R. C. (2011). Studies comparing Numerical Rating Scales, Verbal Rating Scales, and Visual Analogue Scales for assessment of pain intensity in adults: a systematic literature review. *Journal of pain and symptom management, 41*(6), 1073-1093. doi:10.1016/j.jpainsymman.2010.08.016

Jelovsek, J. E., Walters, M. D., & Barber, M. D. (2008). Psychosocial impact of chronic vulvovagina conditions. *The Journal of reproductive medicine, 53*(2), 75-82.

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*: Guilford Press.

Lawrance, K. A., & Byers, E. S. (1995). Sexual satisfaction in long‐term heterosexual relationships: The interpersonal exchange model of sexual satisfaction. *Personal Relationships, 2*(4), 267-285. doi:10.1111/j.1475-6811.1995.tb00092.x

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198-1202. doi:10.1080/01621459.1988.10478722

Litzinger, S., & Gordon, K. C. (2005). Exploring Relationships Among Communication, Sexual Satisfaction, and Marital Satisfaction. *Journal of Sex & Marital Therapy, 31*(5), 409-424. doi:10.1080/00926230591006719

MacNeil, S., & Byers, E. S. (2005). Dyadic assessment of sexual self-disclosure and sexual satisfaction in heterosexual dating couples. *Journal of Social and Personal Relationships, 22*(2), 169-181. doi:10.1177/0265407505050942

MacNeil, S., & Byers, E. S. (2009). Role of sexual self-disclosure in the sexual satisfaction of long-term heterosexual couples. *Journal of Sex Research, 46*(1), 3-14. doi:10.1080/00224490802398399

Manne, S. L., Ostroff, J. S., Norton, T. R., Fox, K., Goldstein, L., & Grana, G. (2006). Cancer-related relationship communication in couples coping with early stage breast cancer. *Psycho-Oncology, 15*(3), 234-247. doi:10.1002/pon.941

Mark, K. P., Herbenick, D., Fortenberry, J. D., Sanders, S., & Reece, M. (2014). A Psychometric Comparison of Three Scales and a Single-Item Measure to Assess Sexual Satisfaction. *Journal of Sex Research, 51*(2), 159-169. doi:10.1080/00224499.2013.816261

Meyer-Bahlburg, H. F., & Dolezal, C. (2007). The female sexual function index: a methodological critique and suggestions for improvement. *Journal of Sex & Marital Therapy, 33*(3), 217-224. doi:10.1080/00926230701267852

Mitchell, K. R., Mercer, C. H., Ploubidis, G. B., Jones, K. G., Datta, J., Field, N., . . . Wellings, K. (2013). Sexual function in Britain: findings from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *Lancet, 382*(9907), 1817-1829. doi:10.1016/S0140-6736(13)62366-1

Montesi, J. L., Fauber, R. L., Gordon, E. A., & Heimberg, R. G. (2011). The specific importance of communicating about sex to couples' sexual and overall relationship satisfaction. *Journal of Social and Personal Relationships, 28*(5), 591-609. doi:10.1177/0265407510386833

Overall, N. C., & Hammond, M. D. (2013). Biased and accurate: depressive symptoms and daily perceptions within intimate relationships. *Personality and Social Psychology Bulletin, 39*(5), 636-650. doi:10.1177/0146167213480188

Pazmany, E., Bergeron, S., Verhaeghe, J., Van Oudenhove, L., & Enzlin, P. (2014). Sexual communication, dyadic adjustment, and psychosexual well-being in premenopausal women with self-reported dyspareunia and their partners: A controlled study. *Journal of Sexual Medicine, 11*(7), 1786-1797. doi:10.1111/jsm.12518

Pazmany, E., Bergeron, S., Verhaeghe, J., Van Oudenhove, L., & Enzlin, P. (2015). Dyadic sexual communication in pre-menopausal women with self-reported dyspareunia and their partners: Associations with sexual function, sexual distress and dyadic adjustment. *Journal of Sexual Medicine, 12*(2), 516-528. doi:10.1111/jsm.12787

Perrone-McGovern, K. M., Oliveira-Silva, P., Simon-Dack, S., Lefdahl-Davis, E., Adams, D., McConnell, J., . . . Goncalves, O. F. (2014). Effects of empathy and conflict resolution strategies on psychophysiological arousal and satisfaction in romantic relationships. *Appl Psychophysiol Biofeedback, 39*(1), 19-25. doi:10.1007/s10484-013-9237-2

Pukall, C. F., Goldstein, A. T., Bergeron, S., Foster, D., Stein, A., Kellogg-Spadt, S., & Bachmann, G. (2016). Vulvodynia: Definition, prevalence, impact, and pathophysiological factors. *Journal of Sexual Medicine, 13*(3), 291-304. doi:10.1016/j.jsxm.2015.12.021

Rancourt, K. M., & Rosen, N. (2016). *The Sexual Communication Patterns Questionnaire - Psychometric Data*. Unpublished raw data.

Rancourt, K. M., Rosen, N. O., Bergeron, S., & Nealis, L. J. (2016). Talking About Sex When Sex Is Painful: Dyadic Sexual Communication Is Associated With Women's Pain, and Couples' Sexual and Psychological Outcomes in Provoked Vestibulodynia. *Archives of Sexual Behavior, 45*(8), 1933-1944. doi:10.1007/s10508-015-0670-6

Reed, B. D., Haefner, H. K., Harlow, S. D., Gorenflo, D. W., & Sen, A. (2006). Reliability and validity of self-reported symptoms for predicting vulvodynia. *Obstetrics & Gynecology, 108*(4), 906-913.

Rehman, U. S., Janssen, E., Newhouse, S., Heiman, J., Holtzworth-Munroe, A., Fallis, E., & Rafaeli, E. (2011). Marital satisfaction and communication behaviors during sexual and nonsexual conflict discussions in newlywed couples: A pilot study. *Journal of Sex & Marital Therapy, 37*(2), 94-103. doi:10.1080/0092623X.2011.547352

Rehman, U. S., Rellini, A. H., & Fallis, E. (2011). The importance of sexual self-disclosure to sexual satisfaction and functioning in committed relationships. *Journal of Sexual Medicine, 8*, 3108-3115. doi:10.1111/j.1743-6109.2011.02439.x

Rosen, N. O., Bergeron, S., Glowacka, M., Delisle, I., & Baxter, M.-L. (2012). Harmful or helpful: Perceived solicitous and facilitative partner responses are differentially associated with pain and sexual satisfaction in women with provoked vestibulodynia. *The Journal of Sexual Medicine, 9*(9), 2351-2360. doi:10.1111/j.1743-6109.2012.02851.x

Rosen, N. O., Bergeron, S., Sadikaj, G., Glowacka, M., Delisle, I., & Baxter, M. L. (2014). Impact of male partner responses on sexual function in women with vulvodynia and their partners: a dyadic daily experience study. *Health Psychology, 33*(8), 823-831. doi:10.1037/a0034550

Rosen, N. O., Rancourt, K. M., Corsini-Munt, S., & Bergeron, S. (2014). Beyond a "woman's problem": The role of relationship processes in female genital pain. *Current Sexual Health Reports, 6*(1), 1-10. doi:10.1007/s11930-013-0006-2

Rosen, N. O., Muise, A., Bergeron, S., Impett, E. A., & Boudreau, G. K. (2015). Approach and Avoidance Sexual Goals in Couples with Provoked Vestibulodynia: Associations with Sexual, Relational, and Psychological Well-Being. *Journal of Sexual Medicine, 12*(8), 1781-1790. doi:10.1111/jsm.12948

Rosen, R. C., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., . . . D'Agostino, R. (2000). The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex & Marital Therapy, 26*(2), 191-208. doi:10.1080/009262300278597

Rosen, R. C., Riley, A., Wagner, G., Osterloh, I. H., Kirkpatrick, J., & Mishra, A. (1997). The international index of erectile function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology, 49*(6), 822-830.

Rosenthal, R., & Rosnow, R. L. (2007). *Essentials of behavioral research: Methods and data analysis* (3rd ed.). New York, NY: McGraw-Hill.

Sanford, K. (2003). Problem–solving conversations in marriage: Does it matter what topics couples discuss? *Personal Relationships, 10*(1), 97-112. doi:10.1111/1475-6811.00038

Scheffer, J. (2002). Dealing with missing data. *Research Letters in the Information and Mathematical Sciences, 3*, 153-160.

Schrodt, P., Witt, P. L., & Shimkowski, J. R. (2013). A Meta-Analytical Review of the Demand/Withdraw Pattern of Interaction and its Associations with Individual, Relational, and Communicative Outcomes. *Communication Monographs, 81*(1), 28-58. doi:10.1080/03637751.2013.813632

Smith, K. B., & Pukall, C. F. (2011). A systematic review of relationship adjustment and sexual satisfaction among women with provoked vestibulodynia. *Journal of Sex Research, 48*(2-3), 166-191. doi:10.1080/00224499.2011.555016

Smith, K. B., & Pukall, C. F. (2014). Sexual function, relationship adjustment, and the relational impact of pain in male partners of women with provoked vulvar pain. *Journal of Sexual Medicine, 11*, 1283-1293. doi:10.1111/jsm.12484

Stephenson, K. R., & Meston, C. M. (2010). Differentiating components of sexual well-being in women: are sexual satisfaction and sexual distress independent constructs? *Journal of Sexual Medicine, 7*(7), 2458-2468. doi:10.1111/j.1743-6109.2010.01836.x

CHAPTER 5: CHANGE TRAJECTORIES OF SEXUAL COMMUNICATION PATTERNS FOR COUPLES RECEIVING COGNITIVE-BEHAVIOURAL COUPLE THERAPY VERSUS MEDICAL INTERVENTION FOR GENITO-PELVIC PAIN/PENETRATION DISORDER

The manuscript prepared for this study is presented below. Readers are advised that Kate Rancourt, under the supervision of Dr. Natalie Rosen, was responsible for devising the research questions and hypotheses, and preparing the datasets for analyses. She led the data analysis and interpretation, with the support of her co-authors. Kate wrote the initial draft of the manuscript, and received and incorporated the feedback from her co-authors. Kate submitted the manuscript to undergo peer-review on June 14, 2017. The current reference for this manuscript is:

Rancourt, K.M., Bergeron, S., Lee-Baggley, D., & Rosen, N.O. (submitted). Change trajectories of sexual communication patterns for couples receiving cognitive-behavioral couple therapy versus medical intervention for genito-pelvic pain/penetration disorder.

5.1 Abstract

Improving communication is an important component of cognitive-behavioral couple therapy (CBCT), yet little research has examined changes in communication over the course of CBCT. Genito-pelvic pain/penetration disorder (GPPPD) has negative consequences for couples' health and well-being, and is associated with sexual communication difficulties. In this study, CBCT aimed to increase couples' collaborative, and decrease their negative, sexual communication patterns (CSCP and NSCP). This study examined the trajectory of change in women and partners' self-reported CSCP and NSCP over the course of CBCT for GPPPD, compared to a medical intervention (lidocaine). Eighty-four couples coping with GPPPD were randomly assigned to 12 weeks of CBCT (N = 41) or lidocaine (N = 43). Growth curve analyses showed that CSCP significantly increased, and NSCP significantly decreased, for women and partners receiving CBCT; NSCP also significantly decreased for women receiving lidocaine. Increases in women's CSCP were significantly greater for women receiving CBCT than lidocaine; a similar trend was seen for partners. Treatment condition did not moderate changes in NSCP: women experienced significant reductions in NSCP irrespective of treatment type. CBCT for GPPPD appears to help couples communicate about their sexual problems in more collaborative ways, and may represent a potential mechanism of treatment effects on couples' sexual and relational outcomes.

Keywords: sexual communication, sexual dysfunction, couples, genito-pelvic pain, couple therapy

5.2 Introduction

Sexual problems are one of the leading reasons for seeking couple therapy (Doss, Simpson, & Christensen, 2004), yet researchers have neglected to examine the processes of change in couple therapy for sexual problems. Likewise, several empirically-supported models of psychological intervention exist, such as Cognitive-Behavioral Therapy (CBT), yet still little is known about *how* therapies result in beneficial treatment outcomes for patients (Kazdin, 2016). A growing niche of psychotherapy research focuses on evaluating the processes that account for the effectiveness of psychological interventions like CBT, including trajectories, mediators, moderators, and mechanisms of change (Kazdin, 2007, 2016; Laurenceau et al., 2007). Studying the processes involved in CBT is crucial for understanding the core interventions that account for therapeutic gains, which would allow researchers and clinicians to improve existing therapies by enhancing the effectiveness and efficiency with which these treatments are delivered (Kazdin, 2009, 2016). Unfortunately, there is a paucity of research on the specific change processes in CBT, especially in forms other than individual therapy, such as sex therapy and Cognitive-Behavioral Couple Therapy (CBCT) (Gurman, 2011; Kazdin, 2016). The present study addresses this gap in knowledge by examining changes in sexual communication patterns over the course of CBCT for couples' coping with a prevalent (8-16% of women) and distressing sexual dysfunction, genito-pelvic pain/penetration disorder (GPPPD) (APA, 2013; Harlow et al., 2014).

Trajectories of communication in couple therapy

One important avenue of process research examines the trajectory of change in relevant, targeted constructs over the course of CBT. Typically, CBT researchers have

examined the rate and/or shape of change of primary treatment outcomes (e.g., symptoms) as a means of informing potential treatment mechanisms (Goldin et al., 2014; Laurenceau et al., 2007; Teachman, Marker, & Smith-Janik, 2008). However, it is also important to examine the trajectories of change in the constructs that are expected to account for symptom reduction in CBT. Studying the trajectories of theorized process variables – such as couple communication in CBCT – in comparison to interventions where these constructs are not expected to change (e.g., a medical treatment), would demonstrate that change in the proposed process variables is accounted for by the CBCT intervention, rather than the passage of time or another type of treatment. Couples' communication patterns are a fundamental intervention target in CBCT (Benson et al., 2012). A primary emphasis of couple therapy is to facilitate change by developing a relationship-centric view of problems affecting the couple, which in CBCT, typically involves altering unhelpful interactional patterns (e.g., avoidance and withdrawal), and facilitating constructive approaches to communication (e.g., empathic responding) (S. D. Davis et al., 2012). Therefore, studying the trajectories of change in couples' communication patterns will enhance understanding of processes of change in CBCT.

Empirical studies of couple therapy for relationship distress demonstrate that couples' communication patterns are more positive following therapy than at the start of therapy, as indicated by pre- to post-treatment reductions in negative communication patterns, and increases in positive communication patterns (Christensen et al., 2004; Cordova et al., 1998; Doss et al., 2005; Sevier et al., 2008). Yet to our knowledge, only one study has examined the change trajectories of communication-related behaviours over the course of couple therapy. Sevier et al. (2015) compared the trajectories of

change in 134 couples' in-session negative (i.e., blame, hard expression, negative pressure to change) and positive communication behaviors (i.e., collaboration, positive affect, engagement) between two forms of behavioural couple therapy for relational distress: integrative (IBCT) or traditional (TBCT). They found that, over a mean of 23 sessions, couples in the IBCT intervention demonstrated initial declines in positive behaviours, and increases in negative behaviours, with improvements in both positive and negative behaviours in the last third of therapy. In contrast, those in the TBCT condition showed initial increases in positive behaviour and declines in negative behaviour, followed by a slight reduction in positive behaviour and an increase in negative behaviour after the mid-point of therapy. Thus, there is promising evidence to suggest that improving communication patterns is a process that is fundamental to couple therapy, although the specific pattern of change may differ depending on the type of therapy.

GPPPD and sexual communication interventions in CBCT

Genito-pelvic pain/penetration disorder (GPPPD) is a female sexual dysfunction characterized by persistent difficulties with sexual intercourse, including fears of, or pain upon penetration, and that causes significant distress for the affected woman (APA, 2013). Researchers and clinicians increasingly conceptualize GPPPD from an interpersonal perspective, because the pain and associated consequences typically occur within a relational context such as partnered sexual activities (Pukall et al., 2016). Thus, interpersonal factors, such as communication about pain and sex, are essential intervention targets (Corsini-Munt, Bergeron, Rosen, Mayrand, et al., 2014).

Currently, GPPPD is thought to be caused and maintained by multiple biological, psychological, and social factors (Bornstein et al., 2016; Pukall et al., 2016); as such, biopsychosocial approaches to intervention, such as CBT, are advantageous as they target this multifactorial etiology. To date, four randomized clinical trials for GPPPD comparing individual or group-based CBT to psychological and medical treatments have supported the efficacy of this intervention for reducing women's pain, and improving their psychological well-being (e.g., depressive and anxiety symptoms, pain catastrophizing and self-efficacy) and sexual function (Bergeron, Binik, Khalife, Pagidas, Glazer, et al., 2001; Bergeron et al., 2016; Bergeron et al., 2008; Masheb et al., 2009; ter Kuile & Weijenborg, 2006).

Recently, Corsini-Munt, Bergeron, Rosen, Mayrand, et al. (2014) developed a couple-based CBT intervention for GPPPD that incorporated existing evidence on the role of interpersonal factors (e.g., see N. O. Rosen, Rancourt, et al. (2014) for a review), as well as common principles of couple therapy (e.g., reconceptualizing the problem as dyadic, addressing unhelpful communication dynamics; (Benson et al., 2012). They piloted their CBCT with eight couples, and found that women experienced pre- to post-treatment reductions in their pain intensity during intercourse and improvements in their sexual function; moreover, both women and partners reported improvements in their sexual satisfaction. Importantly, couples in this study rated the communication interventions as the most helpful and preferred interventions of the treatment protocol, suggesting that sexual communication might be central to the perceived benefits of CBCT.

Sexual communication refers to couples' communication about the sexual aspects of their relationship (Babin, 2013), such as their sexual preferences and sexual problems. Several studies of women with GPPPD and their partners have demonstrated that they report lower or more inhibited sexual communication than unaffected couples (Jelovsek et al., 2008; Pazmany et al., 2014; Schover et al., 1992; Smith & Pukall, 2014). A higher quality of sexual communication has been associated with women's lower pain intensity and sexual distress, and both women with GPPPD and their partners' higher sexual satisfaction, sexual functioning, relationship satisfaction, and lower depressive symptoms (Rancourt et al., 2016; Smith & Pukall, 2014). Further, Rancourt, Flynn, Bergeron, and Rosen (2017) found that greater perceptions of collaborative sexual communication patterns (SCP; i.e., communication patterns reflecting collaboration between partners, such as problem-solving, and expressing feelings) were associated with women's and partners' higher sexual and relationship satisfaction, and lower sexual distress. In contrast, more negative SCP (i.e., communication patterns involving the expression of negative affect and/or withdrawal, such as criticism and demand-withdrawal sequences), were associated with women's and partners' lower relationship satisfaction and partners' higher sexual distress. Taken together, these findings indicate that *how* couples communicate with one another about problems in their sexual relationship may be central to their adjustment to GPPPD, and further support sexual communication as a key target for couples-based interventions.

In relation to GPPPD, the CBCT developed by Corsini-Munt, Bergeron, Rosen, Mayrand, et al. (2014) involves communication interventions targeted at reducing the expression of high negative affect (e.g., criticism) and/or emotional and physical

avoidance in response to the pain and sexual problems, and guiding couples to replace these tendencies with alternative, collaborative approaches – such as emotional disclosure, empathic responding, and responses that encourage adaptive pain coping. Thus, the CBCT for GPPPD aimed to reduce women's and partners' negative SCP, and increase collaborative SCP. Evidence to support these trajectories in CBCT, but not a comparison treatment, is an essential first step toward investigating SCP as a mechanism of treatment outcome in CBCT for GPPPD.

The Current Study

The current study is part of a larger randomized clinical trial comparing two treatments for couples coping with GPPPD: women's topical application of an anesthetic ointment (5% lidocaine) and CBCT (Corsini-Munt, Bergeron, Rosen, Steben, et al., 2014). Topical lidocaine is an evidence-based medical treatment that aims to reduce the hypersensitization of nerves in the vulvar region, a neurophysiological factor implicated in the most common subtype of GPPPD (Pukall et al., 2016; Zolnoun et al., 2003). Couples randomized to the lidocaine treatment received no intervention regarding their sexual communication, and thus represented a comparison group for the present investigation.

The primary objective of this study was to examine the within-group (i.e., lidocaine or CBCT) trajectories in women's and partners' collaborative and negative SCP over the course of 12-weeks of treatment. Hypothesis 1a: women with GPPPD and their partners would exhibit increases in collaborative SCP and decreases in negative SCP within the CBCT condition; Hypothesis 1b: women and partners would exhibit non-significant changes in both collaborative SCP and negative SCP over the course of the

lidocaine intervention. The secondary objective of this study was to examine whether treatment condition moderated the trajectories of women's and partners' collaborative SCP and negative SCP over time. Hypothesis 2: treatment condition would significantly moderate the change trajectories for women and partners wherein women and partners in the CBCT group would show significantly greater increases in collaborative SCP, and significantly greater decreases in negative SCP, compared to women and partners in the lidocaine group.

5.3 Method

5.3.1 Participants

Women and their romantic partners were recruited between April 2014 and January 2017 to participate in the present study. Inclusion criteria for couples were as follows: (1) age 18 years and older; (2) in a committed monogamous relationship with each other of at least six months duration; (3) attempted vaginal penetration (e.g., intercourse) with one another at least once per month for the past three months; (4) cohabiting and/or maintained at least four in-person contacts per week in the last six months; (5) the woman was experiencing pain, provoked by pressure to the vulvar vestibule, for a minimum of six months and on at least 80% of penetration attempts; (6) the woman received a diagnosis of provoked vestibulodynia, a common subtype of GPPPD (Harlow & Stewart, 2003), from a collaborating gynecologist. Provoked vestibulodynia (PVD) involves pain that is elicited when pressure is applied to the vulvar vestibule (i.e., vaginal entrance). The gynecologist followed a standardized protocol including the cotton swab test, whereby women self-report pain upon random palpation

of the vulvar vestibule at 3, 6, and 9 o'clock (Bergeron, Binik, Khalife, Pagidas, & Glazer, 2001).

Exclusion criteria included: (1) women over 45 years of age (due to vulvar changes in the peri-menopausal period; (Mitchell et al., 2013); (2) women who had an active vaginal infection or dermatological condition, as identified by the gynecologist; (3) couples who were pregnant or planning a pregnancy; (4) couples who were unwilling or unable to stop other treatments for GPPPD for the study period; (5) couples who were presently in couples therapy; (6) couples where either partner had a major untreated medical or psychiatric disorder (e.g., major depressive disorder) that might interfere with their ability to maximally benefit from the treatment; (7) couples who met criteria for clinically-significant levels of relational distress (indicated by the clinical cut-off score on the well-validated Couple Satisfaction Index; (Funk & Rogge, 2007), or who self-reported intimate partner violence and/or systematic threat or manipulation within the couple. This exclusion criterion existed because of the negative impact of relational distress and intimate partner violence on physical, mental, and sexual well-being, which may need to be addressed prior to a couple's involvement in sex therapy (Cobia, Robinson, & Edwards, 2008).

Figure 5.8.1 shows a flowchart of participation in this study. Two-hundred and ninety-three women were screened for eligibility via the following recruitment sources: print or online advertisements (n = 178, 60.8%), health care provider referrals (n = 63, 21.5%), or prior participation in our research studies (n = 46, 15.7%) and other (n = 6, 2.0%). Based on the eligibility criteria, 135 (46.1%) couples were ineligible for the following reasons: partner not eligible or not interested (n = 25, 8.5%), did not meet pain

criteria or PVD diagnosis (*n* = 46, 15.7 %), ineligible relationship status (*n* = 19, 16.5%), ineligible age (*n* = 9, 3.1%), pursuing other treatment (*n* = 18, 6.1%), significant comorbid condition or relational distress (*n* = 16, 5.5%), and other (*n* = 2, 0.7%). A further 26 (8.9%) were lost to follow-up following their initial eligibility screening, and 48 women (16.4%) declared they were no longer interested in participating after the screening. The final sample included 84 (28.7%) couples: 43 who were randomized to lidocaine and 41 to CBCT.

5.3.2 Procedure

This study was a two-site, randomized clinical trial; study protocols were consistent across the two sites (Corsini-Munt, Bergeron, Rosen, Steben, et al., 2014). Each institution's research ethics board approved the study. A research assistant conducted an initial eligibility screening via telephone, and a PhD-level graduate student in clinical psychology further assessed couples' eligibility for the study during a laboratory-based appointment. During this appointment, couples provided their informed consent to participate, and completed a brief structured interview to gather sociodemographic information. Women and partners also independently completed baseline measures (T_0), some of which were used to evaluate their eligibility for the study (e.g., measures of psychological and relationship functioning). Couples were compensated with $30 for their participation in the pre-randomization evaluation session.

Eligible couples were then randomized to one of two treatment conditions, lidocaine or CBCT, using Dacima Clinical Suite (Dacima Software Inc., Montreal, QC, Canada). The randomization parameters are described in detail elsewhere (Corsini-Munt, Bergeron, Rosen, Steben, et al., 2014), but ensured that within each study site, roughly an

equal number of participants were randomized to each condition, approximately two weeks prior to beginning the treatment protocol. Once couples began treatment, women and partners were asked to independently complete online measures of SCP two days after the start of treatment week 1 (T_1) as well as at week 4 (T_2), week 8 (T_3), and week 12 (T_4); participants received a reminder email if the survey had not been completed within 24 hours.

5.3.3 Treatment Conditions

Cognitive-Behavioural Couple Therapy (CBCT); (Corsini-Munt, Bergeron, Rosen, Mayrand, et al., 2014). Couples attended 12, weekly, 75-minute sessions of CBCT. As described in Corsini-Munt, Bergeron, Rosen, Steben, et al. (2014), the goals of the CBCT were to target couples': a) cognitions, behaviors, and emotions regarding GPPPD, b) conceptualization of the pain with the goal of framing it as a shared problem, c) communication about GPPPD and sex, d) pain management skills and coping with the impact of GPPPD on the sexual relationship, and e) sexual adjustment (i.e., sexual satisfaction, distress, and function). These goals were attained through individual and couple interventions regarding chronic pain and sexuality both in-session and at home. A significant focus of the in-session and at home practice in CBCT was couples' communication. In the third session, couples were taught and coached on the use of effective communication skills – namely, self-disclosure (e.g., "I" statements) and active listening techniques. They were encouraged to practice these skills frequently at home, as well as part of an in-session exercise to facilitate expressing sexual and relationship needs to one another. The CBCT manual directed therapists to draw out couples' practice of these communication skills, using enactments to facilitate emotional disclosure and active

listening, for the duration of the therapy (e.g., in the context of other therapy content). In the seventh session, the therapists elicited a discussion between the woman and her partner about continued difficulties around sexual communication and worked to address barriers.

The CBCT therapists were PhD-level students in clinical psychology (N = 8) or junior clinicians (PsyD or PhD, N = 2; MA in clinical sexology, N = 1) who attended weekly supervision sessions with a registered clinical psychologist with broad experience in sex and couple therapy, including delivering the CBCT intervention to couples coping with GPPPD. Therapists received extensive training in delivering the CBCT treatment manual, fundamental principles of sex and couple therapy, and the relevant empirical GPPPD literature prior to seeing their first couple. Thirty-six couples attended all 12 sessions of CBCT, whereas five couples dropped out over the course of therapy.

Topical Lidocaine. Women attended a laboratory-based appointment with a trained research assistant who explained the lidocaine application protocol, which was based on the standardized protocol described in Zolnoun et al. (2003). Women were instructed to apply a marble-sized amount of a 5% lidocaine ointment to the vulvar vestibule every night for 12 weeks. Women were also asked to place a cotton square coated with the lidocaine ointment on the affected area overnight, kept in place by wearing underwear to bed (to ensure approximately eight hours of contact). A research assistant conducted weekly phone calls to assess for any potential adverse events and monitor adherence; these calls did not involve supportive listening or counseling. Thirty-nine women completed the full lidocaine protocol, whereas three withdrew from treatment.

5.3.4 Measures

Sexual Communication Patterns. Sexual communication patterns were assessed using the Sexual Communication Patterns Questionnaire (S-CPQ; Rancourt et al., 2017; Rancourt & Rosen, 2016). This 22-item measure assesses individuals' perceptions of the likelihood, on a 1 (*very unlikely*) to 9 (*very likely*) Likert-type scale, that they and their partner use various patterns of communication when problems arise in the sexual relationship. The S-CPQ is comprised of two subscales: (1) 'Collaborative SCP' contains 8 items that reflect a mutual engagement in collaborative approaches to sexual problem discussions (e.g., *both members express feelings to each other*); (2) 'Negative SCP' contains 14 items that reflect the expression of negative affect or withdrawal on the part of one or both members of the couple (e.g., *both members blame, accuse, or criticize each other*). Total summed subscale scores range from 8 to 72 for the collaborative SCP subscale, and from 14 to 126 for the negative SCP subscale; higher scores indicate a greater likelihood of using these patterns of sexual communication. The factor structure of the S-CPQ was established in an online sample of 263 women and men, and these data also supported the internal consistency and convergent and discriminant validity of this measure (Rancourt et al., 2017; Rancourt & Rosen, 2016). In the present study, alpha coefficients across all time-points ranged from 0.58 to 0.86 for the collaborative SCP subscale[2] (*M* alpha = 0.77), and from 0.74 to 0.93 for the negative SCP subscale (*M* alpha = 0.87).

[2] Note that only 2 measurement occasions demonstrated alpha coefficients below 0.70.

5.3.5 Data Analyses

We conducted growth curve analyses using multilevel modeling (MLM) and HLM 7 software (Raudenbush, Bryk, & Congdon, 2013). Growth curve models include an intercept (i.e., SCP at T_0) as well as a slope (i.e., the rate of change in SCP from T_0 to T_4) for each individual. Given the objectives of this study, all participants who had begun a treatment (and thus had 2 or more measures of SCP) were included in the present analysis (N = 84 couples), regardless of attrition or missing data[3]. Of 209 possible surveys for participants in lidocaine, 207 were completed for women and 201 for partners (completion rates of 99% and 96%, respectively). Of 194 possible surveys for participants in CBCT, 194 were completed for women and 185 for partners (completion rates of 100% and 95%, respectively). Growth curve analysis using HLM accounts for missing data and handles variability in the spacing of repeated measures (Raudenbush & Bryk, 2002).

Growth curve analyses examined the rate of change in women's and partners' collaborative and negative SCP over the course of CBCT and lidocaine treatments for GPPPD. Data were represented within a two-level model, where individuals' data (Level 1) was nested within treatment condition (Level 2)[4]. Analyses were conducted separately for collaborative and negative SCP, and were also conducted separately for women with GPPPD and their partners due to weak-to-moderate correlations between women's and partners' reports of SCP at each time-point (r = .14 – .56). To address hypothesis 1a and

[3] Mean imputation was used when participants were missing less than 10% of items on the S-CPQ (i.e., 2 items or less); participants missing more than 10% of their data on the S-CPQ were considered to have incomplete data and were marked as "missing" for that time-point.

[4] There was insufficient power to analyze the data as couples in level 1.

1b (i.e., to examine the trajectories of change in SCP within each treatment), the first analysis evaluated the rate of change in collaborative and negative SCP for women and partners' receiving CBCT separately from women and partners receiving lidocaine. Level 1 modeled the within-person variability in SCP as a function of time (indicated by treatment week, and coded so that baseline was set to 0 and the final week of treatment was coded as 4, resulting in five time points overall). Thus, the intercept reflects SCP at T_0, prior to beginning a treatment. Level 2 modeled the between-person variability in intercepts and slopes. Slopes were allowed to vary randomly across participants in models where the variance components were found to be significant, representing significant individual variability. In cases where there was no significant variation in the slope, the slope was fixed in order to maximize power.

To address objective 2 (i.e., to examine whether SCP trajectories significantly differed between treatment conditions), the second analysis examined whether the rate of change in collaborative and negative SCP for women and partners was moderated by treatment condition (CBCT - coded as 1; lidocaine - coded as 0). Level 1 was modeled the same as in the first analysis. Level 2 modeled the between-person variability in intercepts and slopes as a function of treatment condition. Simple slopes analyses for multilevel models were used to further investigate significant interactions (Preacher, Curran, & Bauer, 2006).

A sample equation, representing the second analysis follows:

Level 1:

$$\text{Women's collaborative SCP}_{ti} = \pi_{0i} + \pi_{1i}\,(\text{Treatment Week}) + e_{ti}$$

Level 2:

$$\pi_{0i} = \beta_{00} + \beta_{00} \text{ (Treatment Condition)} + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11} \text{ (Treatment Condition)} + r_{1i}$$

In the above Level 1 regression equation, π_{0i} refers to the intercept coefficient, π_{1i} to the slope coefficient, and e_{ti} to the residual error term for each individual, $_{i.}$

5.4 Results

Sample characteristics

Descriptive statistics for the sociodemographic characteristics of this sample are presented in Table 5.7.1, and the means and standard deviations of women's and partners' collaborative and negative SCP within treatment condition and across time-points are presented in Table 5.7.2.

Trajectories of change in women's and partners' SCP within each treatment

Hypothesis 1a and 1b: Table 5.7.3 shows the coefficients and standard errors of the growth curve analyses for women's and partners' collaborative and negative SCP within the lidocaine and the CBCT treatment conditions, separately. For both women with GPPPD and their partners, collaborative SCP significantly increased over the course of CBCT, whereas there were no significant changes in collaborative SCP over the course of lidocaine treatment. For both women with GPPPD and their partners, negative SCP significantly decreased over the course of CBCT. However, women's reported negative SCP were also found to significantly decrease over the course of the lidocaine treatment; there were no significant changes in partners' negative SCP in the lidocaine condition.

Moderating effect of treatment condition on trajectories of women's and partners' SCP

Hypothesis 2: Table 5.7.4 shows the growth curve analyses examining whether treatment condition moderated the trajectories of women's and partners' collaborative

and negative SCP over the course of treatment. As can be seen in Figure 5.8.2A, there was a significant and positive interaction effect of treatment week by treatment condition for women's collaborative SCP. An exploration of this interaction using simple slopes analysis for multilevel modeling indicated a significant cross-interaction wherein women receiving CBCT demonstrated increased collaborative SCP over the course of treatment, whereas the trajectory of collaborative SCP for women receiving lidocaine was relatively constant over time. For partners, there was also a trending treatment week by treatment condition interaction on collaborative SCP (p = .09). While this effect did not reach statistical significance, Figure 5.8.2B shows that the effect paralleled the cross-interaction on women's collaborative SCP, whereby partners in the CBCT condition reported increased collaborative SCP over time relative to no change in the lidocaine condition.

Results also indicated that women with GPPPD reported reductions in their negative SCP over the course of treatment. There was no significant treatment condition by treatment week interaction, indicating that the rate of reduction in women's negative SCP did not differ between women receiving CBCT and those receiving lidocaine (Figure 5.8.2C). For partners, there was no treatment week by treatment condition interaction effect on negative SCP (Figure 5.8.2D).

5.5 Discussion

The overarching aim of this study was to examine the trajectories of change in women's and partners' collaborative and negative sexual communication patterns (SCP) over the course of cognitive behavioural couple therapy (CBCT) for GPPPD, relative to lidocaine treatment. Compared to women with GPPPD treated with lidocaine, those receiving CBCT exhibited significantly greater increases in collaborative SCP over the

course of treatment; a parallel effect was seen for partners' collaborative SCP, although this effect did not reach statistical significance. These findings are consistent with empirical and theoretical literature that highlight the role of couple therapies in improving couples' conflict communication (e.g., Sevier et al., 2015), and importantly, extend these findings to the domain of sexual communication patterns for couples' experiencing GPPPD, a distressing sexual problem. The effects for negative SCP provide a murkier picture of change through CBCT intervention: women with GPPPD experienced reductions in negative SCP over the course of treatment regardless of whether they received CBCT or lidocaine. In contrast, only partners receiving CBCT exhibited significant reductions in negative SCP, although the trajectories for partners' negative SCP did not significantly differ between the CBCT and lidocaine conditions.

Consistent with our hypotheses, women with GPPPD and their partners experienced significant improvements in collaborative SCP over the course of CBCT, whereas women and partners receiving lidocaine did not. Moreover, these change trajectories in collaborative SCP differed significantly between treatment conditions for women, and were trending for partners. These findings show that CBCT, a couple therapy for GPPPD that works to facilitate couples' collaborative approaches to sexual communication, does in fact contribute to couples reporting a greater use of these communication patterns over time; in contrast, with a strictly medical intervention, couples coping with GPPPD do not appear to become more collaborative in discussing their sexual problems. Therapist modeling and coaching in the use of collaborative communication skills, like emotional disclosure and empathic response, might help couples to use communication for approaching their sexual problems as a team. Indeed,

behavioural couple therapy commonly teaches couples a set of communication skills to help them talk about their difficulties in what is thought to be a more constructive way (Benson et al., 2012). Alternatively, it is possible that the experience of participating in couple therapy for GPPPD is inherently motivating for couples, encouraging them to adopt more collaborative stances around their sexual issues. Couple therapies are also known to facilitate shifts in the attributions that couples make concerning their problems (e.g., viewing issues as a relationship challenge when they were formerly seen as the partner's "fault"; (Benson et al., 2012; S. D. Davis et al., 2012), which was also a treatment goal of the CBCT. This conceptual shift may have promoted the use of more collaborative SCP. That CBCT appears to be useful for improving couples' collaborative sexual communication is particularly important given that collaborative SCPs have been associated with higher relationship and sexual satisfaction, and lower sexual distress, in couples coping with GPPPD (Rancourt et al., 2017) and that in general, higher quality communication has been associated with more positive pain-related, sexual, psychological, and relational outcomes in couples coping with GPPPD (Pazmany et al., 2015; Rancourt et al., 2016). Further research is warranted to examine whether increased collaborative SCP through CBCT acts as a mediator of positive treatment outcomes in this population.

As expected, women with GPPPD and their partners both experienced reductions in negative SCP over the course of CBCT. Yet surprisingly, women also experienced reductions in negative SCP in the lidocaine condition. Moreover, the change trajectories in negative SCP did not significantly differ between treatment conditions for women, nor for partners. Thus, although negative SCPs were directly targeted, the CBCT did not

contribute to overall greater reductions in couples' use of negative approaches to discussing their sexual problems than did a non-psychological intervention. Due to the lack of a no-treatment/waitlist control group, it is possible that these findings indicate that changes in women's negative SCP occurred as the result of time rather than intervention. However, these findings may also suggest that any intervention – psychological or not – could allow women with GPPPD to reduce the degree to which they approach sexual problems with conflict or withdrawal, or perceive such reductions in their sexual communication. It is possible that engaging in treatment helps to reduce pain and/or soothe the high degree of emotional distress experienced by women with GPPPD and their partners (Nylanderlundqvist & Bergdahl, 2003; Pazmany et al., 2014). In turn, reduced pain/distress may facilitate greater emotion regulation, which may translate to either a reduction in negative SCP or a perception that SCP are less negative over time (Gross, 1998; Leong et al., 2011). Similarly, Brotto et al. (2015) showed that women on the waitlist for a mindfulness-based cognitive therapy for GPPPD experienced significant increases in pain self-efficacy and decreases in sexual distress *prior* to beginning the treatment. Thus, it is possible that expectancies for improvement through treatment may contribute to actual or perceived changes in couples' communication interactions (Cormier, Lavigne, Choiniere, & Rainville, 2016). It is encouraging that women with GPPPD reported reductions in negative SCP through treatment given than more negative SCP are associated with higher sexual distress and poorer relationship satisfaction (Rancourt et al., 2017).

This study demonstrated the independence of change trajectories for collaborative and negative SCP during treatment for GPPPD: whereas a clear pattern of improvement

emerged for women's and partners' collaborative SCP via CBCT intervention, the pattern of change was less clear for negative SCP. Thus, when considering psychotherapy processes and potential treatment mechanisms in CBCT for GPPPD, it may be necessary to consider collaborative and negative approaches to sexual communication as distinct, though related, especially given that this study did not provide strong support for changes in negative SCP as being uniquely related to CBCT intervention.

Theoretical and Practical Implications

Findings provide empirical support that clinicians should continue targeting couples' collaborative SCP, and potentially negative SCP, in CBCT for GPPPD. In such interventions, clinicians are advised to consider the distinct patterns of change found in this study for negative and collaborative SCP. As stated by Benson et al. (2012), helping couples to reduce negative communication tendencies may not automatically result in the adoption of more collaborative forms of communication, as these skills may still need to be taught and nurtured. Indeed, there is emerging evidence demonstrating that positive contextual factors (e.g., affection) predict longitudinal relationship outcomes above and beyond negative factors (e.g., hostile communication) (Gordon & Chen, 2016; Graber, Laurenceau, Miga, Chango, & Coan, 2011).

The results of this study also suggest that clinicians and couples' alike may benefit from the routine monitoring of couples' self-reported SCP – particularly their collaborative SCP – over the course of couples-based CBT intervention for GPPPD. Monitoring session-by-session change is thought to be a useful feedback method for clinicians and clients to ensure that treatment is resulting in intended outcomes (Lambert & Shimokawa, 2011). Thus, if couples receiving CBCT for GPPPD are failing to make

gains in adopting more collaborative approaches to discussing their sexual problems, this may signal clinicians to modify their approach by placing greater emphasis on helping couples adopt these communication patterns, and working through any barriers to doing so.

Limitations and future research

This study sample focused on a specific form of GPPPD – provoked vestibulodynia – which may limit the generalizability of these findings to other couples coping with GPPPD or other sexual dysfunctions. Couples experiencing significant relational distress, or who were not currently attempting sexual intercourse, were not included in the clinical trial. It is possible that these criteria may have impacted the degree to which negative SCPs were reported in this sample, as more distressed or sexually avoidant couples may engage in higher rates of negative SCP (e.g., avoidance, withdrawal, criticism, threats or demands). Future studies should replicate these findings in more heterogeneous samples of couples coping with other forms of sexual dysfunction (e.g., sexual interest/arousal disorder).

The discussion of results in the present study draws on existing cross-sectional research in GPPPD samples, which has shown that collaborative SCP are associated with more positive sexual and relationship outcomes for couples coping with GPPPD than negative SCP (Rancourt et al., 2017). However, labelling these constructs as "collaborative" and "negative" SCP may be premature, given that research has not yet evaluated the function of SCP over time, nor the contexts within which SCPs operate (McNulty & Fincham, 2012). For example, it may be that couples' negative SCP are less detrimental when they occur in a relationship or therapeutic context that is experienced as

stable, intimate, and secure. Thus, future therapy process research is needed to parse apart how treatment-related changes in SCP, and other relevant interpersonal variables (e.g., couple intimacy, therapeutic alliance; (S. D. Davis et al., 2012), account for post-treatment and longitudinal outcomes in GPPPD.

This study asked couples to report on their likelihood of using SCPs at repeated time points through the use of self-report measures, which are subject to social desirability effects and other self-report biases. The field would benefit from studying sexual communication patterns using diverse methods such as observational coding of couples' communication patterns within therapy sessions (Sevier et al., 2015) or intimate discussions (Rehman, Janssen, et al., 2011), or validating couples' reports of SCP against therapist reports of these behaviours in session. These approaches would help to clarify the nature of change in couples' SCP over the course of therapy, quantifying the degree to which change occurs objectively versus subjectively, or in-session versus between-sessions. Ultimately, such endeavours may shed further light on the external validity of targeting couples' SCP in CBCT for GPPPD.

Conclusions

Answering calls for the increased study of process variables in psychotherapy (Kazdin, 2009, 2016; Laurenceau et al., 2007), and more specifically, in couple therapy (Gurman, 2011), the present study evaluated changes in sexual communication patterns over the course of CBCT for GPPPD, a theorized process variable in couple therapies (Benson et al., 2012). Importantly, by comparing changes in SCP over the course of CBCT to changes over the course of a medical treatment, where no changes were expected to occur, this study demonstrated how changes in SCP were accounted for by

the CBT intervention. Compared to couples' receiving medical treatment for GPPPD, women with GPPPD and their partners who partook in couple-based CBT for GPPPD exhibited greater improvements in collaborative patterns of sexual communication. In contrast, women with GPPPD showed reductions in negative sexual communication patterns in both medical and couple-based CBT interventions. These findings offer evidence that couple-based CBT is important for improving couples' communication about their sexual problems, particularly the collaborative communication patterns that have been associated with more favorable sexual and relational outcomes in this population (Rancourt et al., 2017). These findings provide support for the further exploration of SCP as a potential therapy mechanism in CBCT, which would improve researchers and clinicians' understanding of how this therapy results in beneficial treatment outcomes for couples coping with GPPPD.

5.6 Acknowledgments

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5.7 Tables

Table 5.7.1

Sociodemographic characteristics for the sample (N = 84 couples)

Characteristic	*M* (range) or *N*	*SD* or %
Age (years)		
Women	26.86 (18-44)	6.21
Partners	28.43 (19-56)	6.95
Partners' sex		
Male	81	96.4
Female	3	3.6
Education (years)		
Women	17.12 (11-22)	2.29
Partners	16.35 (11-24)	2.67
Culture		
Women[a]		
English Canadian	29	34.9
French Canadian	34	41.0
Other[b]	20	24.1
Partners		
English Canadian	36	42.9
French Canadian	27	32.1
Other[b]	21	25.0
Couples' annual income[a]		
$0-19,999	16	19.3
$20,000-39,999	17	20.5
$40,000-59,999	11	13.3
$60,000-79,999	14	16.9
$80,000-99,999	9	10.8
>$100,000	16	19.3
Couples' relationship status		
Married	23	27.4
Common law	21	25.0
Living together, not married	23	27.4
Not living together	17	20.2
Couples' relationship length (months)	66.45 (6-240)	52.36
Women's pain duration (months)	77.06 (6-312)	64.08

[a] n = 83; [b] 'Other' includes Asian, Latin American, African, European, Middle Eastern, Caribbean

Note: SD = standard deviation

Table 5.7.2.

Means and standard deviations of collaborative (CSCP) and negative sexual communication patterns (NSCP) by treatment condition and time for women with GPPPD and their partners (N = 84)

SCP by Treatment	Women					Partners				
	T0	T1	T2	T3	T4	T0	T1	T2	T3	T4
CSCP										
Lidocaine	49.33 (10.23)	47.36 (11.18)	47.17 (12.48)	49.42 (12.62)	48.79 (12.70)	49.47 (9.95)	43.27 (9.81)	48.51 (13.73)	48.15 (11.90)	47.28 (12.42)
CBCT	49.15 (9.92)	43.41 (10.05)	50.54 (10.10)	52.68 (12.39)	52.81 (11.70)	47.02 (10.72)	46.45 (10.48)	48.79 (9.42)	49.03 (8.21)	50.48 (9.74)
NSCP										
Lidocaine	38.44 (17.76)	31.23 (15.95)	29.00 (15.83)	30.61 (17.41)	26.77 (15.44)	35.26 (14.89)	33.71 (16.63)	37.44 (23.43)	31.70 (16.49)	31.72 (14.92)
CBCT	36.24 (14.08)	34.12 (13.50)	27.97 (12.95)	29.08 (15.94)	29.78 (14.96)	38.89 (16.90)	31.25 (12.72)	31.49 (13.55)	32.50 (17.16)	28.48 (14.04)

Table 5.7.3.

Growth curve analyses predicting changes in collaborative (CSCP) and negative sexual communication patterns (NSCP) for women with GPPPD and their partners receiving CBCT or lidocaine treatment

	Treatment Condition: CBCT			Treatment Condition: Lidocaine		
	Fixed Effects		Random Effects	Fixed Effects		Random Effects
Predictor	Unstandardized Coefficient	SE	Variance Component	Unstandardized Coefficient	SE	Variance Component
Women with GPPPD						
Predicting CSCP						
Intercept	46.40***	1.42	55.00***	48.16***	1.57	84.78***
Week of Treatment	1.57**	0.50	4.74**	0.19	0.46	5.03***
Predicting NSCP						
Intercept	35.17***	1.87	86.96***	36.06***	2.41	199.64***
Week of Treatment	-1.94***	0.62	4.74*	-2.47***	0.62	6.98**
Partners						
Predicting CSCP						
Intercept	46.61***	1.51	71.82***	47.26***	1.34	69.81***
Week of Treatment	0.96*	0.42	2.53**	-0.01	0.41	--
Predicting NSCP						
Intercept	36.30***	2.23	133.05***	35.67***	2.36	193.20***
Week of Treatment	-1.96*	0.82	13.18***	-0.58	0.48	--

Note. Growth curve analyses predicting changes in CSCP and NSCP within the CBCT treatment are based on 194 responses from 41 women with GPPPD and their partners. Growth curve analyses predicting changes in CSCP and NSCP within the lidocaine treatment are based on 209 responses from 43 women with GPPPD and their partners. *SE* = standard error. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 5.7.4.

Growth curve analyses predicting changes in collaborative (CSCP) and negative sexual communication patterns (NSCP) for women with GPPPD and their partners as a function of treatment condition

	Fixed Effects		Random Effects
Predictor	Unstandardized Coefficient	SE	Variance Component
Women with GPPPD			
Predicting CSCP			
Intercept	48.16***	1.57	70.34***
Week of Treatment	0.19	0.46	4.90***
Treatment Condition	-1.75	2.12	--
Treatment Condition X Week of Treatment	1.36*	0.68	--
Predicting NSCP			
Intercept	36.07***	2.41	144.60***
Week of Treatment	-2.47***	0.62	5.86**
Treatment Condition	-0.90	3.05	--
Treatment Condition X Week of Treatment	0.54	0.87	--
Partners			
Predicting CSCP			
Intercept	47.26***	1.34	60.65***
Week of Treatment	0.01	0.41	--
Treatment Condition	-0.70	2.01	--
Treatment Condition X Week of Treatment	0.99$^{\tau}$	0.59	--
Predicting NSCP			
Intercept	35.67***	2.36	135.28***
Week of Treatment	-0.60	0.49	--
Treatment Condition	0.78	3.23	--
Treatment Condition X Week of Treatment	-1.49	0.94	--

Note. Growth curve analyses predicting changes in CSCP and NSCP are based on 401 responses from 84 women with GPPPD and their partners. *SE* = standard error. For treatment condition, lidocaine = 0 and CBCT = 1.
$^{\tau}p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

5.8 Figures

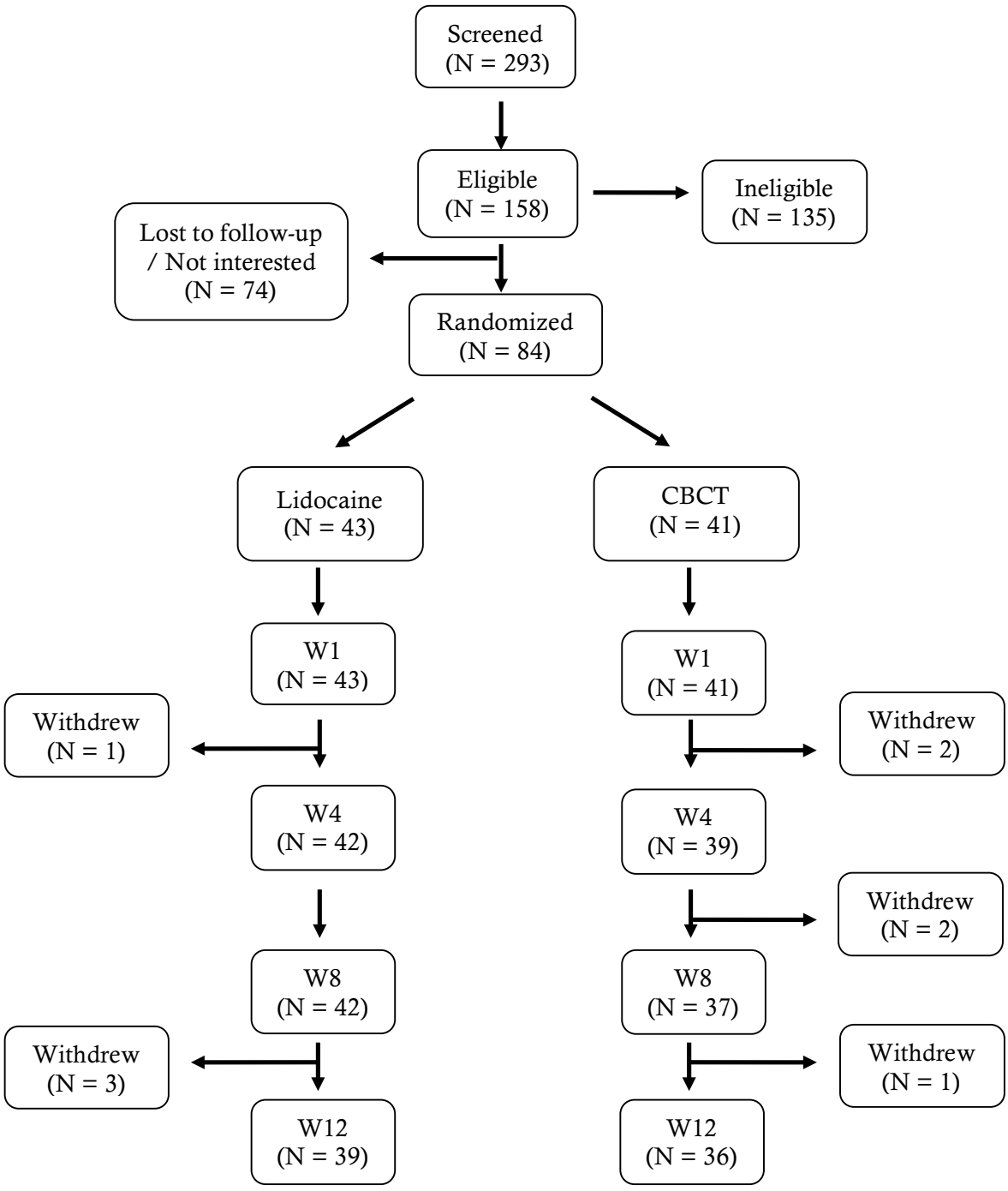

Figure 5.8.1. Flow of participants through current study. Measurements occurred every four weeks ('W') during treatment.

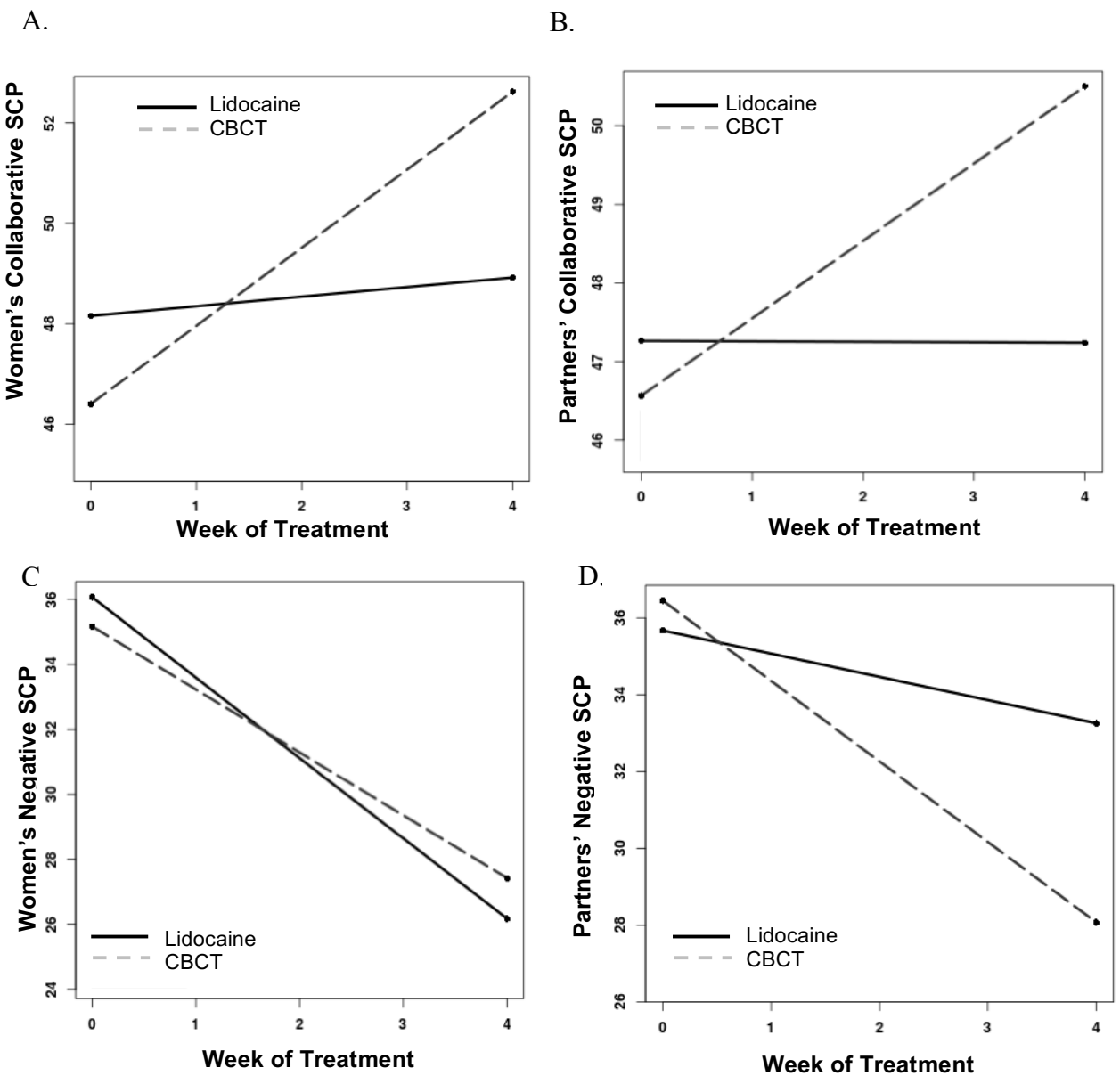

Figure 5.8.2. Trajectories for women's and partners' collaborative and negative sexual communication patterns (SCP) over the course of CBCT and lidocaine interventions for GPPPD.

5.9 References

APA. (2013). *Diagnostic and statistical manual of mental disorders : DSM-5* (5th ed.). Arlington, Va.: American Psychiatric Association.

Babin, E. A. (2013). An examination of predictors of nonverbal and verbal communication of pleasure during sex and sexual satisfaction. *Journal of Social and Personal Relationships, 30*(3), 270-292. doi:10.1177/0265407512454523

Benson, L. A., McGinn, M. M., & Christensen, A. (2012). Common principles of couple therapy. *Behav Ther, 43*(1), 25-35. doi:10.1016/j.beth.2010.12.009

Bergeron, S., Binik, Y. M., Khalife, S., Pagidas, K., & Glazer, H. I. (2001). Vulvar vestibulitis syndrome: Reliability of diagnosis and evaluation of current diagnostic criteria. *Obstetrics & Gynecology, 98*(1), 45-51.

Bergeron, S., Binik, Y. M., Khalife, S., Pagidas, K., Glazer, H. I., Meana, M., & Amsel, R. (2001). A randomized comparison of group cognitive--behavioral therapy, surface electromyographic biofeedback, and vestibulectomy in the treatment of dyspareunia resulting from vulvar vestibulitis. *Pain, 91*(3), 297-306.

Bergeron, S., Khalife, S., Dupuis, M. J., & McDuff, P. (2016). A randomized clinical trial comparing group cognitive-behavioral therapy and a topical steroid for women with dyspareunia. *Journal of Consulting and Clinical Psychology, 84*(3), 259-268. doi:10.1037/ccp0000072

Bergeron, S., Khalife, S., Glazer, H. I., & Binik, Y. M. (2008). Surgical and behavioral treatments for vestibulodynia: Two-and-one-half year follow-up and predictors of outcome. *Obstetrics & Gynecology, 111*(1), 159-166. doi:10.1097/01.AOG.0000295864.76032.a7

Bornstein, J., Goldstein, A. T., Stockdale, C. K., Bergeron, S., Pukall, C., Zolnoun, D., . . . Society, t. I. P. P. (2016). 2015 ISSVD, ISSWSH and IPPS Consensus terminology and classification of persistent vulvar pain and vulvodynia. *Obstetrics & Gynecology, 127*(4), 745-751. doi:10.1097/AOG.0000000000001359

Brotto, L. A., Basson, R., Smith, K. B., Driscoll, M., & Sadownik, L. (2015). Mindfulness-based Group Therapy for Women with Provoked Vestibulodynia. *Mindfulness, 6*(3), 417-432. doi:10.1007/s12671-013-0273-z

Christensen, A., Atkins, D. C., Berns, S., Wheeler, J., Baucom, D. H., & Simpson, L. E. (2004). Traditional versus integrative behavioral couple therapy for significantly and chronically distressed married couples. *J Consult Clin Psychol, 72*(2), 176-191. doi:10.1037/0022-006X.72.2.176

Cobia, D. C., Robinson, K., & Edwards, L. (2008). Intimate Partner Violence and Women's Sexual Health: Implications for Couples Therapists. *The Family Journal, 16*(3), 249-253. doi:10.1177/1066480708317670

Cordova, J. V., Jacobson, N. S., & Christensen, A. (1998). Acceptance versus change interventions in behavioral couple therapy: impact on couples' in-session communication. *J Marital Fam Ther, 24*(4), 437-455.

Cormier, S., Lavigne, G. L., Choiniere, M., & Rainville, P. (2016). Expectations predict chronic pain treatment outcomes. *Pain, 157*(2), 329-338. doi:10.1097/j.pain.0000000000000379

Corsini-Munt, S., Bergeron, S., Rosen, N. O., Mayrand, M. H., & Delisle, I. (2014). Feasibility and preliminary effectiveness of a novel cognitive-behavioral couple therapy for provoked vestibulodynia: A pilot study. *Journal of Sexual Medicine, 11*(10), 2515-2527. doi:10.1111/jsm.12646

Corsini-Munt, S., Bergeron, S., Rosen, N. O., Steben, M., Mayrand, M. H., Delisle, I., . . . Santerre-Baillargeon, M. (2014). A comparison of cognitive-behavioral couple therapy and lidocaine in the treatment of provoked vestibulodynia: Study protocol for a randomized clinical trial. *Trials, 15*, 506. doi:10.1186/1745-6215-15-506

Davis, S. D., Lebow, J. L., & Sprenkle, D. H. (2012). Common factors of change in couple therapy. *Behav Ther, 43*(1), 36-48. doi:10.1016/j.beth.2011.01.009

Doss, B. D., Simpson, L. E., & Christensen, A. (2004). Why Do Couples Seek Marital Therapy? *Professional Psychology: Research and Practice, 35*(6), 608-614. doi:10.1037/0735-7028.35.6.608

Doss, B. D., Thum, Y. M., Sevier, M., Atkins, D. C., & Christensen, A. (2005). Improving relationships: mechanisms of change in couple therapy. *J Consult Clin Psychol, 73*(4), 624-633. doi:10.1037/0022-006X.73.4.624

Funk, J. L., & Rogge, R. D. (2007). Testing the ruler with item response theory: increasing precision of measurement for relationship satisfaction with the Couples Satisfaction Index. *J Fam Psychol, 21*(4), 572-583. doi:10.1037/0893-3200.21.4.572

Goldin, P. R., Lee, I., Ziv, M., Jazaieri, H., Heimberg, R. G., & Gross, J. J. (2014). Trajectories of change in emotion regulation and social anxiety during cognitive-behavioral therapy for social anxiety disorder. *Behav Res Ther, 56*, 7-15. doi:10.1016/j.brat.2014.02.005

Gordon, A. M., & Chen, S. (2016). Do you get where I'm coming from?: Perceived understanding buffers against the negative impact of conflict on relationship satisfaction. *Journal of Personality and Social Psychology, 110*(2), 239-260. doi:10.1037/pspi0000039

Graber, E. C., Laurenceau, J. P., Miga, E., Chango, J., & Coan, J. (2011). Conflict and love: predicting newlywed marital outcomes from two interaction contexts. *J Fam Psychol, 25*(4), 541-550. doi:10.1037/a0024507

Gross, J. J. (1998). The emerging field of emotion regulation. *Review of General Psychology, 2*(3), 271-299.

Gurman, A. S. (2011). Couple therapy research and the practice of couple therapy: can we talk? *Fam Process, 50*(3), 280-292. doi:10.1111/j.1545-5300.2011.01360.x

Harlow, B. L., Kunitz, C. G., Nguyen, R. H., Rydell, S. A., Turner, R. M., & MacLehose, R. F. (2014). Prevalence of symptoms consistent with a diagnosis of vulvodynia: Population-based estimates from 2 geographic regions. *American Journal of Obstetrics & Gynecology, 210*(1), 40 e41-48. doi:10.1016/j.ajog.2013.09.033

Harlow, B. L., & Stewart, E. G. (2003). A population-based assessment of chronic unexplained vulvar pain: have we underestimated the prevalence of vulvodynia? *J Am Med Womens Assoc (1972), 58*(2), 82-88.

Jelovsek, J. E., Walters, M. D., & Barber, M. D. (2008). Psychosocial impact of chronic vulvovagina conditions. *The Journal of reproductive medicine, 53*(2), 75-82.

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annu Rev Clin Psychol, 3*, 1-27. doi:10.1146/annurev.clinpsy.3.022806.091432

Kazdin, A. E. (2009). Understanding how and why psychotherapy leads to change. *Psychother Res, 19*(4-5), 418-428. doi:10.1080/10503300802448899

Kazdin, A. E. (2016). Evidence-based psychosocial treatment: Advances, surprises, and needed shifts in foci. *Cognitive and Behavioral Practice, 23*, 426-430.

Lambert, M. J., & Shimokawa, K. (2011). Collecting client feedback. *Psychotherapy (Chic), 48*(1), 72-79. doi:10.1037/a0022238

Laurenceau, J. P., Hayes, A. M., & Feldman, G. C. (2007). Some methodological and statistical issues in the study of change processes in psychotherapy. *Clin Psychol Rev, 27*(6), 682-695. doi:10.1016/j.cpr.2007.01.007

Leong, L. E., Cano, A., & Johansen, A. B. (2011). Sequential and base rate analysis of emotional validation and invalidation in chronic pain couples: Patient gender matters. *Journal of Pain, 12*(11), 1140-1148. doi:10.1016/j.jpain.2011.04.004

Masheb, R. M., Kerns, R. D., Lozano, C., Minkin, M. J., & Richman, S. (2009). A randomized clinical trial for women with vulvodynia: Cognitive-behavioral therapy vs. supportive psychotherapy. *Pain, 141*(1-2), 31-40. doi:10.1016/j.pain.2008.09.031

McNulty, J. K., & Fincham, F. D. (2012). Beyond positive psychology? Toward a contextual view of psychological processes and well-being. *Am Psychol, 67*(2), 101-110. doi:10.1037/a0024572

Mitchell, K. R., Mercer, C. H., Ploubidis, G. B., Jones, K. G., Datta, J., Field, N., . . . Wellings, K. (2013). Sexual function in Britain: findings from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *Lancet, 382*(9907), 1817-1829. doi:10.1016/S0140-6736(13)62366-1

Nylanderlundqvist, E., & Bergdahl, J. (2003). Vulvar vestibulitis: Evidence of depression and state anxiety in patients and partners. *Acta dermato-venereologica, 83*(5), 369-373.

Pazmany, E., Bergeron, S., Verhaeghe, J., Van Oudenhove, L., & Enzlin, P. (2014). Sexual communication, dyadic adjustment, and psychosexual well-being in premenopausal women with self-reported dyspareunia and their partners: A controlled study. *Journal of Sexual Medicine, 11*(7), 1786-1797. doi:10.1111/jsm.12518

Pazmany, E., Bergeron, S., Verhaeghe, J., Van Oudenhove, L., & Enzlin, P. (2015). Dyadic sexual communication in pre-menopausal women with self-reported dyspareunia and their partners: Associations with sexual function, sexual distress and dyadic adjustment. *Journal of Sexual Medicine, 12*(2), 516-528. doi:10.1111/jsm.12787

Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interaction effects in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics, 31*, 437-448.

Pukall, C. F., Goldstein, A. T., Bergeron, S., Foster, D., Stein, A., Kellogg-Spadt, S., & Bachmann, G. (2016). Vulvodynia: Definition, prevalence, impact, and pathophysiological factors. *Journal of Sexual Medicine, 13*(3), 291-304. doi:10.1016/j.jsxm.2015.12.021

Rancourt, K. M., Flynn, M., Bergeron, S., & Rosen, N. O. (2017). It Takes Two: Sexual Communication Patterns and the Sexual and Relational Adjustment of Couples Coping With Provoked Vestibulodynia. *J Sex Med, 14*(3), 434-443. doi:10.1016/j.jsxm.2017.01.009

Rancourt, K. M., & Rosen, N. (2016). *The Sexual Communication Patterns Questionnaire - Psychometric Data*. Unpublished raw data.

Rancourt, K. M., Rosen, N. O., Bergeron, S., & Nealis, L. J. (2016). Talking About Sex When Sex Is Painful: Dyadic Sexual Communication Is Associated With Women's Pain, and Couples' Sexual and Psychological Outcomes in Provoked Vestibulodynia. *Arch Sex Behav, 45*(8), 1933-1944. doi:10.1007/s10508-015-0670-6

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models : applications and data analysis methods* (2nd ed.). Thousand Oaks: Sage Publications.

Raudenbush, S. W., Bryk, A. S., & Congdon, R. (2013). HLM 7.01 for Windows [Computer software]. Skokie, IL: Scientific Software International, Inc.

Rehman, U. S., Janssen, E., Newhouse, S., Heiman, J., Holtzworth-Munroe, A., Fallis, E., & Rafaeli, E. (2011). Marital satisfaction and communication behaviors during sexual and nonsexual conflict discussions in newlywed couples: A pilot study. *Journal of Sex & Marital Therapy, 37*(2), 94-103. doi:10.1080/0092623X.2011.547352

Rosen, N. O., Rancourt, K. M., Corsini-Munt, S., & Bergeron, S. (2014). Beyond a "woman's problem": The role of relationship processes in female genital pain. *Current Sexual Health Reports, 6*(1), 1-10. doi:10.1007/s11930-013-0006-2

Schover, L. R., Youngs, D. D., & Cannata, R. (1992). Psychosexual aspects of the evaluation and management of vulvar vestibulitis. *American Journal of Obstetrics and Gynecology, 167*(3), 630-636.

Sevier, M., Atkins, D. C., Doss, B. D., & Christensen, A. (2015). Up and down or down and up? The process of change in constructive couple behavior during traditional and integrative behavioral couple therapy. *Journal of Marital and Family Therapy, 41*(1), 113-127. doi:10.1111/jmft.12059

Sevier, M., Eldridge, K., Jones, J., Doss, B. D., & Christensen, A. (2008). Observed communication and associations with satisfaction during traditional and integrative behavioral couple therapy. *Behav Ther, 39*(2), 137-150. doi:10.1016/j.beth.2007.06.001

Smith, K. B., & Pukall, C. F. (2014). Sexual function, relationship adjustment, and the relational impact of pain in male partners of women with provoked vulvar pain. *Journal of Sexual Medicine, 11*, 1283-1293. doi:10.1111/jsm.12484

Teachman, B. A., Marker, C. D., & Smith-Janik, S. B. (2008). Automatic associations and panic disorder: trajectories of change over the course of treatment. *J Consult Clin Psychol, 76*(6), 988-1002. doi:10.1037/a0013113

ter Kuile, M. M., & Weijenborg, P. T. (2006). A cognitive-behavioral group program for women with vulvar vestibulitis syndrome (VVS): Factors associated with treatment success. *Journal of Sex & Marital Therapy, 32*(3), 199-213. doi:10.1080/00926230600575306

Zolnoun, D. A., Hartmann, K. E., & Steege, J. F. (2003). Overnight 5% lidocaine ointment for treatment of vulvar vestibulitis. *Obstet Gynecol, 102*(1), 84-87.

CHAPTER 6: GENERAL DISCUSSION

The overarching aims of this dissertation were to examine the role of sexual communication (i.e., dyadic sexual communication and sexual communication patterns) in couples' biopsychosocial adjustment to PVD, and to examine whether there was a trajectory of improvement in couples' sexual communication patterns over the course of a cognitive-behavioural couple therapy (CBCT) for PVD.

Studies 1 and 2 (described in Chapters 2 and 4) examined the dyadic, cross-sectional associations between couples' sexual communication and their pain-related, sexual, relational, and psychological outcomes. Using two dyadic measures of sexual communication, results showed that perceiving more favourable sexual communication (i.e., higher dyadic sexual communication or collaborative sexual communication patterns) was generally associated with women's and partners' greater sexual, relational, and psychological well-being. In contrast, perceiving more negative sexual communication (lower dyadic sexual communication or negative sexual communication patterns) was generally associated with poorer well-being, particularly with respect to women's and partners' satisfaction and distress. This pattern of results was consistent with the only other study to examine associations between dyadic sexual communication and couple outcomes in an heterogeneous sample of women with vulvar pain problems (Pazmany et al., 2015).

Study 3 (described in Chapter 5) examined the trajectories of change in women's and partners' collaborative and negative sexual communication patterns over the course of CBCT for PVD, relative to a medical intervention (lidocaine). Results showed that women engaging in CBCT exhibited significantly greater improvement in collaborative sexual communication patterns than those engaging in lidocaine treatment, with a similar

trending effect for partners. With respect to negative sexual communication patterns, women experienced significant reductions in negative sexual communication patterns irrespective of treatment condition. For partners, only those receiving CBCT demonstrated significant reductions in negative sexual communication patterns, although the change trajectory of negative sexual communication patterns was not significantly different from partners in the lidocaine condition.

6.1 Discussion of divergent findings

Overall, more favourable sexual communication was associated with greater well-being for women with PVD and their partners across emotional, relational, and sexual domains. However, beyond this general pattern, some important differences emerged across the first two studies. The associations between sexual communication and both pain and sexual functioning remain unclear. Although study 1 found an association between partners' perceived dyadic sexual communication and women's lower pain intensity, this finding stands in contrast to Pazmany et al. (2015) findings, and was not replicated in study 2 using a different measure of sexual communication. Similarly, study 1 showed associations between women's and partners' greater dyadic sexual communication and their own sexual functioning, yet sexual communication patterns were unrelated to sexual functioning in study 2. Sample and methodological differences between the studies may help to explain these findings. Study 1 included a larger sample of couples (N = 107) than both Pazmany et al. (2015) and study 2 (N = 87). In past research with couples coping with PVD, interpersonal variables were typically weakly related to women's pain (Awada et al., 2014; Bois et al., 2013; Leclerc et al., 2015); thus, the greater sample size in study 1 may have increased the power to determine statistically

significant effects of this magnitude. Also, unlike study 1, study 2 included a sample of couples seeking treatment for PVD. While the average pain intensity and sexual functioning scores were similar across both samples, it is possible that an additional confounding variable, such as couples' motives for participating in the research or level of psychological distress, might have influenced the associations between sexual communication and pain and sexual functioning in study 2.

Differences in the sexual communication constructs may also explain the divergent findings for pain intensity and sexual functioning. Dyadic sexual communication reflects the perceived quality of communication (Pazmany et al., 2015), whereas sexual communication patterns reflect the perceived affective and behavioural communication responses between partners regarding problems in their sexual relationship. Thus, one major difference between these measures may be the context recalled around sexual communication: the Dyadic Sexual Communication Scale cued couples to reflect on sexual communication broadly, possibly causing them to think of both positive and negative discussions, and perhaps in multiple environments (e.g., both inside and outside the context of sexual activity). In contrast, the measure of sexual communication patterns instructed couples to reflect on sexual communication in the context of sexual problems in their relationship. It is possible that the more broadly defined quality of sexual communication in the relationship has a greater impact on reports of sexual functioning and pain than the more specific discussions about sexual conflicts. Sexual conflicts (at least as assessed by the Sexual Communication Patterns Questionnaire) are unlikely to occur during actual sexual activity, which may explain

why sexual communication patterns were only weakly related to individuals' reports of physiological functioning during sexual activity (i.e., pain, sexual functioning).

6.2 Theoretical Implications

6.2.1 Interpersonal and Biopsychosocial Models of PVD

Integrating the findings across all three studies, this dissertation demonstrated that sexual communication is a relevant interpersonal factor for many aspects of couples' adjustment to PVD. That sexual communication is relevant to women's and partners' well-being is consistent with the growing field of health research that focuses on integrating interpersonal context into the study of chronic pain, sexuality, or other health conditions (Berg & Upchurch, 2007; Dewitte, 2014; Leonard et al., 2006). Interpersonal models of health recognize that when one person in a partnership is impacted by a health problem, the systemic context must be accounted for when considering the affected individual's outcomes (Berg & Upchurch, 2007). The results of this dissertation suggest that for women affected by PVD, how couples perceive their sexual communication is an important component of that systemic context: women's perceptions of sexual communication were related to their adjustment to PVD, and partners' perceptions of sexual communication were also associated with aspects of women's well-being. These findings indicate that a richer understanding of women's outcomes in PVD can be gained by studying the interpersonal effects of couple dynamics.

Importantly, such interpersonal models also consider the impact of health conditions like PVD on the unaffected partner, recognizing that when one person in a partnership is experiencing a health concern, this often impacts the other partner, too (Berg & Upchurch, 2007). This pattern was evident in the present dissertation, where

sexual communication was found to be related to almost as many aspects of partners' well-being as women's own well-being. Indeed, that one person's perceived sexual communication impacts their partner's outcomes indicates that the associations between sexual communication and outcomes are inter-individual; thus, improving sexual communication for one partner is likely to have beneficial effects for the other member of the couple, and vice versa. These findings support the continued implementation of interpersonally-focused models of PVD in research and practice, and indicate that sexual communication is a relevant component of such models.

Encouragingly, higher quality sexual communication (e.g., greater dyadic sexual communication, more collaborative sexual communication patterns, fewer negative sexual communication patterns) was consistently related to more favourable psychosocial outcomes (e.g., sexual satisfaction, relationship satisfaction, and psychological distress) for women with PVD and their partners (see also Pazmany et al. (2015). From a biomedical perspective, clinicians and researchers have historically applied a symptom-focused lens to vulvar pain problems, placing a greater emphasis on physiological factors in PVD, like pain and sexual functioning (e.g., Goldstein et al., 2016). Yet the current findings add to a mounting body of evidence that supports an expanded, biopsychosocial view of PVD and its associated difficulties, where quality of life is seen to be equally as important as physical function (Bergeron, Rosen, & Morin, 2011; Chisari & Chilcot, 2017). Biopsychosocial models recognize that it is often the subjective aspects of health problems – namely, the accompanying distress and dissatisfaction, which in the case of PVD is both individually and relationally-situated (e.g., low emotional, relational, and sexual well-being) – that contribute to the greatest interference. That is, pain and sexual

functioning issues are not a problem in and of themselves – it is *distress* about pain and sexual dysfunction that makes them so. Indeed, subjective distress and life dissatisfaction are often the forces that drive people to seek treatment (Hajek, Bock, & Konig, 2017). Therefore, that sexual communication was consistently related to women's and partners' subjective distress (e.g., depressive symptoms, sexual distress) and satisfaction (e.g., relational and sexual satisfaction) in these two studies indicates that sexual communication may be relevant to improving couples' well-being in the face of this condition. From the perspective of biopsychosocial interventions, these findings suggest that targeting couples' sexual communication could play a role in reducing couple distress and improving their well-being, even while pain and sexual dysfunction persist.

6.2.2 Knowledge of Sexual Communication and PVD

That sexual communication was related to more favorable outcomes for couples coping with PVD is also consistent with theoretical and empirical evidence supporting the pivotal role of communication in various aspects of couple relationships. Theoretical models such as the developmental-contextual model and empathy models of chronic pain view couples' communication as a tool that facilitates dyadic coping (Berg & Upchurch, 2007), and emotional intimacy and well-being (Leonard et al., 2006) in the face of chronic health conditions. Similarly, findings for the present dissertation are generally consistent with the broader relationship communication literature, which emphasizes the differential impact of positively and negatively-valenced communication behaviours during conflict discussions on couples' relationship adjustment and stability (Woodin, 2011).

The overall pattern of results is also consistent with a specific model of sexual communication – The Two Pathways Model of sexual self-disclosure – which suggests that sexual self-disclosure helps couples build intimacy and enact behavioural changes, thereby contributing to more favourable sexual outcomes (MacNeil & Byers, 2009). This dissertation did not specifically evaluate these explanatory pathways between sexual communication and couple outcomes (i.e., the instrumental and expressive pathways). Testing the pathways by which sexual communication contributes to favourable outcomes for couples' coping with PVD is likely to be an important contribution to the literature. The present dissertation demonstrated that the Two Pathways Model may be relevant for more than couples' sexual outcomes, at least in a sample of couples coping with PVD; findings in this study demonstrated that sexual communication was also related to couples' emotional, relational, and pain-related outcomes.

6.2.3 Sexual Communication in Therapy for PVD

The results of studies 1 and 2 support targeting sexual communication in biopsychosocial interventions for PVD, such as CBT. However, as sexual communication involves two people, and empirically-supported models of CBT have focused exclusively on women with PVD (e.g., Bergeron, Binik, Khalife, Pagidas, Glazer, et al., 2001; Bergeron et al., 2016), sexual communication had not been studied in an intervention context prior to study 3. Branching off of the pilot results of CBCT for PVD, which indicated that couples perceived benefits from communication-related interventions in this therapy program (Corsini-Munt, Bergeron, Rosen, Mayrand, et al., 2014), study 3 demonstrated that CBCT led to changes in self-reported sexual communication patterns for couples.

Findings from study 3 advance the theoretical and empirical literature on change processes in couple therapy. Several clinical researchers have suggested that improving communication is a key mechanism for improving well-being through couple therapy (Benson et al., 2012; S. D. Davis et al., 2012; Sevier et al., 2015). The results of this dissertation add to a small but growing body of empirical evidence supporting these assertions: couple therapy results in communication improvements in the expected direction (Doss et al., 2005; Sevier et al., 2015; Sevier et al., 2008).

This dissertation also offers a unique and valuable contribution to the sex therapy literature, as it is the first study to examine change processes in sex-focused couple therapy. Situating the findings from study 3 within the broader literature on interpersonal factors in PVD, sexuality, and couple therapies, sexual communication warrants further investigation as a mechanism of treatment effects in CBCT for PVD. The results of study 3 indicate that this is particularly the case for collaborative sexual communication patterns, whereas the role of negative sexual communication patterns in CBCT is less clear. It will be important to replicate these effects in the future to better clarify the trajectories of change in collaborative and negative sexual communication patterns for couples receiving therapy for PVD.

6.3 Strengths and Limitations

The strengths and limitations of each study have been outlined in the manuscripts included in chapters 2, 4, and 5. This research also has some broader strengths and limitations.

6.3.1 Conceptualization of sexual communication

This dissertation measured two different, yet conceptually-related, sexual communication constructs (e.g., dyadic sexual communication and sexual communication patterns). Together, the investigation of these constructs provided a more comprehensive and nuanced understanding of the role of sexual communication in couples coping with PVD. Yet there are also some conceptual limitations to this work that are reflected in the broader field of relationship psychology.

First, the relationships research literature suffers from a long-standing history of ascribing bipolar, value-based labels to relationship constructs (e.g., constructive versus destructive/negative communication patterns) as opposed to using process-based terminology (e.g., approach versus avoidance). Such value-based labelling is problematic because it presupposes the impact of relationship factors on couples' outcomes (e.g., deeming a communication pattern as "destructive" or "negative" prior to demonstrating that it has harmful effects; (McNulty & Fincham, 2012). The importance of considering these nuances in labelling is clear in the relationship communication literature, where so-called "destructive" communication processes (e.g., anger) sometimes predict beneficial relationship outcomes (e.g., through greater conflict resolution, leading to long-term marital adjustment) (Gottman & Krokoff, 1989), and "constructive" communication processes (e.g., problem-solving) are sometimes shown to be detrimental to couple relationships (e.g., through ineffective conflict engagement and resolution, leading to greater marital distress; (Snyder, Mangrum, & Wills, 1993).

To address these limitations, a concerted effort was made in this research regarding the naming of the subscales for the Sexual Communication Patterns

Questionnaire used in studies 2 and 3. The subscales of "negative" and "collaborative" were named based on the underlying affective (e.g., negative affect) and interpersonal processes (e.g., collaboration) represented in the items, rather than preconceptions of how these subscales would impact couples' outcomes. However, it must be noted that the term "negative" may still be considered to involve a value judgment.

Second, while a handful of studies suggest that couples perceive sexual communication to be more difficult than communication about many other relationship issues (Rehman, Janssen, et al., 2011; Williamson et al., 2013), it is likely premature to say that this is an established finding in the literature due to small sample sizes, inconsistent findings regarding the perceived difficulty of sexual communication for men and women, and methodological decisions (e.g., considering sexuality in the same category as relational intimacy). It also remains unclear to what extent topic difficulty impacts communication behaviours (Sanford, 2003; Williamson et al., 2013). In fact, Sanford (2003) found that during lab-based problem-solving discussions, couples' communication behaviours were relatively consistent irrespective of changes in topic difficulty; however, couples experiencing conflict over a highly difficult topic in their daily lives were more likely to engage in negative communication behaviours for all the lab-based problem-solving discussions. Thus, the more a couple experiences conflict in an area, the more they may approach all problem-focused conversations with negativity. This finding may mean that for couples experiencing conflicts regarding sexuality, they may approach sexual communication in the same way that they approach other common areas of relationship conflict, such as finances, or parenting. Consequently, it might not be *sexual* communication specifically that is problematic, but rather couples' conflict

communication, in general. Unfortunately, this research did not control for couples' broader relationship communication patterns; thus, it is not clear whether sexual communication patterns predicted couples' outcomes above and beyond the ways they communicate about other issues in their relationship.

6.3.2 Sample

This dissertation focused exclusively on couples where the woman was diagnosed with PVD, yet continued to attempt or engage in penetrative sexual activity. Additionally, couples were ineligible for study 3 if they were also experiencing significant relational distress or severe health problems. Finally, studies 2 and 3 involved a sample of couples recruited for a treatment study. As such, study results may be affected by a selection bias, impacting the generalizability of the findings to couples who experience other forms of genito-pelvic pain, are unwilling and/or unable to engage in penetrative sexual activities or treatment for PVD, or are experiencing a more complex set of stressors impacting their well-being (e.g., significant physical or mental health problems, significant relational distress). At the same time, the homogeneity of this sample ensured stronger internal validity, which was particularly important given the RCT design of study 3.

The inclusion and exclusion criteria for this clinical sample also resulted in a slow recruitment rate, and may have hindered the power to detect statistically significant effects in studies 2 and 3. The inclusion of participants across two study sites helped to offset the recruitment challenges of this clinical research, yet was also a limitation because of cultural and language differences between the two sites (with one site being predominantly English-Canadian and the other being predominantly French-Canadian and more multicultural). Self-report measures of sexual communication and outcome

variables were translated to be available to participants in both English and French. Guidelines outline effective approaches to the cross-cultural adaptation of measures to different languages (Wild et al., 2005), and this research adopted several of these recommendations – namely, the forward- and back-translation of measures from a translator who was independent from the research group. As this approach may not have fully addressed concerns regarding the equivalency of measures in both languages, steps were also taken to evaluate whether site differences existed in the samples, and to account for any site differences as necessary in the analyses.

6.3.3 Research design

Consistent with recommendations to integrate dyadic models into the study of pain and sexuality (Dewitte, 2014; Leonard et al., 2006; R. G. Reed et al., 2013), studies 1 and 2 included both women with PVD and their romantic partners, dyadic measures of sexual communication completed by both members of the couple, and a dyadic analytic approach that allowed for the examination of interpersonal effects. Study 3 had additional methodological strengths, including the random assignment of couples to treatment condition, and the use of multiple measurement points to evaluate changes in women's and partners' self-reported sexual communication patterns over the course of couples' treatments.

However, the design of this dissertation was also limited in important ways. An important limitation of this research is that different indices of distress and satisfaction were used between studies 1 (i.e., depression and sexual satisfaction) and 2 (i.e., sexual distress, sexual satisfaction, relationship satisfaction), which limits the ability to make conclusions about the effects of different sexual communication constructs on all distress

and satisfaction outcomes. Moreover, while the objective of this research was to study the role of sexual communication in couples' adjustment to PVD, other key relationship variables (e.g., emotional intimacy, romantic attachment) were not examined in this research; thus, this dissertation does not parse out the specific effects of sexual communication from the broader relationship context within which sexual communication occurs. As discussed in Chapters 2 and 3, the limitations of being unable to tease apart interdependent processes is also true in relation to the cross-sectional designs of studies 1 and 2, which did not allow for the evaluation of directionality in the associations between sexual communication constructs and couples' outcomes.

6.4 Future research directions

6.4.1 Interpersonal factors in PVD

The factor analysis of the Sexual Communication Patterns Questionnaire supported a two-factor structure, and as such, this dissertation examined the average level of women's and partners' collaborative and negative sexual communication patterns. While the collaborative sexual communication patterns subscale represented a cohesive set of items, the negative sexual communication patterns subscale collapsed across a variety of negative styles of sexual communication, some that were approach-focused (e.g., criticize/defend, blaming), some that were avoidance-focused (e.g., withdrawal or avoidance), and some that were both (e.g., demand-withdrawal). Although the internal consistency of this subscale was very good, it would still be ideal to confirm the factor structure of the Sexual Communication Patterns Questionnaire in a larger, independent sample because it is possible that more nuanced patterns of negative sexual communication patterns might emerge. Additionally, future research on sexual

communication in PVD may benefit from a more nuanced investigation of these different patterns, and how they function in couples' relationships. Daily diary designs would allow researchers to understand whether couples routinely address sexual problems using the same sexual communication patterns, or whether couples tend to use a variety of communication patterns regarding sexual conflicts. Perhaps most importantly, diary designs might also be able to determine whether certain negative patterns of sexual communication have a greater impact on couples' well-being than others. This question may be particularly necessary to investigate given findings from the broader relationship communication literature, which have shown that certain negative communication patterns – such as demand-withdrawal patterns – tend to be particularly detrimental to couples' well-being (Schrodt et al., 2013).

Another important direction for future research concerns the overlap between broader relationship communication and sexual communication in couples coping with PVD. Research on broader relationship factors is lagging for couples coping with PVD, likely because the predominant domain of interference is couples' sexual relationships, and research shows a less consistent impact of PVD on couples' overall relationship well-being (Smith & Pukall, 2011). Teasing apart whether these couples specifically struggle with sexual communication, or whether communication as a whole is negatively impacted, could improve couple-based intervention approaches for PVD. Such research would clarify whether communication-related interventions need to be content-focused (e.g., sex versus other common relational stressors), or whether couples' can be taught to employ affective, cognitive, and behavioural communication skills in the same way for

all areas of conflict, thereby potentially improving the generalizability of any treatment gains.

A third future research direction concerns the temporal study of interpersonal factors, like sexual communication, in couples coping with PVD. Recognizing the significant costs of relationship dissolution, relationship researchers have long examined the longitudinal effects of communication difficulties on marital outcomes (Gottman, 1993; Gottman & Krokoff, 1989). Yet despite the interpersonal difficulties imposed by PVD, longitudinal designs are largely lacking in the interpersonal literature on PVD. Thus, a necessary step forward will be to examine the longitudinal effects of sexual communication on couples' adjustment to this condition. In addition, the field would benefit from testing the theoretical mechanisms by which interpersonal factors like sexual communication are thought to lead to more or less favourable outcomes for couples coping with PVD (e.g., testing the two-pathways model over time). Examining these longitudinal mechanisms would provide more conclusive evidence of the temporal pathways between sexual communication and couple outcomes, which may lead to more precise intervention targets in CBCT for PVD.

6.4.2 Psychotherapy processes in PVD interventions

There are several relevant directions for future psychotherapy process research that extend from this dissertation. First, study 3 provided an important contribution to both the PVD and the couple and sex therapy literatures by demonstrating that CBCT led to improvements in couples' collaborative sexual communication patterns. A necessary next step is to examine whether improvements in collaborative sexual communication patterns over the course of CBCT accounts for improvements in couples' treatment

outcomes. Examining whether changes in collaborative sexual communication patterns contribute to treatment gains may result in a greater understanding of the potential mechanisms of therapeutic effects in CBCT for PVD. In the future, inquiry into psychotherapy processes might help researchers and clinicians to refine and/or improve couple-based interventions for PVD by indicating the components of CBCT interventions that are most impactful in improving couples' well-being (Gurman, 2011).

Another relevant future direction is to examine whether baseline sexual communication patterns moderates the degree to which couples benefit from CBCT intervention. Other treatment studies in PVD samples show that psychological factors at baseline, such as pain self-efficacy, influence the degree to which women experience gains from group-CBT programs (Desrochers, Bergeron, Khalife, Dupuis, & Jodoin, 2010). Similar questions may be considered in relation to couple-based therapies for PVD. For example, when starting couple therapy for PVD, do couples with more collaborative and less negative sexual communication patterns have a greater *capacity* to gain from the CBCT intervention? Do couples who start with more negative and less collaborative sexual communication patterns have *more* to gain from the intervention? Answering these questions would be particularly helpful for considering which couples might benefit most from CBCT, and may allow researchers to partial out subgroups of participants that need additional intervention for CBCT to be most beneficial.

For example, clinicians have long recognized that it is difficult for couples to approach sexuality in an emotionally safe manner when they are experiencing other significant relationship issues (e.g., Metz & Epstein, 2002). Due to the clinical trial setting of this research, couples experiencing such relational difficulties were ineligible to

participate. In the setting of a clinical trial, it is problematic to deliver the structured CBCT intervention to such couples because the result is that neither set of issues is adequately addressed: CBCT is meant to address sexuality and pain-related issues, but these cannot be addressed to the extent needed when couples require a greater focus on core relationship issues, such as emotional intimacy and commitment concerns. Thus, clinicians would benefit from research examining moderators of treatment effects, such as relationship distress, as it could guide the assessment of couples presenting for therapy to determine which couples might benefit from the structured CBCT protocol, and which couples may require additional and/or alternative interventions to improve treatment effectiveness.

6.5 Clinical Implications

Metaphorically, communication is the toolbox that allows couples to face relational difficulties with resilience, and enact changes that improve the well-being of their relationship. Yet not all toolboxes are created equal: when faced with relational stressors, some couples may benefit from guidance to make sure they are using the correct tool for the job, or to help them sharpen tools that might be dull and worn down. Theoretical and empirical literature has long supported communication interventions as a core component of couple therapies for relational distress (e.g., Benson et al., 2012; S. D. Davis et al., 2012; Jacobson & Addis, 1993), and the present research extends these findings to the context of sexual communication for a distressing sexual pain condition, PVD. Overall, this dissertation demonstrates that targeting sexual communication is an important component of couples' well-being and adjustment to PVD as well as couple-based psychological interventions for PVD.

Studies 1 and 2 showed that sexual communication was associated with multiple beneficial outcomes for both women with PVD *and* their partners, suggesting that both members of the couple likely benefit from intervention to improve the ways they discuss the sexual difficulties imposed by this condition. The strength of a couple therapy approach is that the PVD-related problems are addressed from a systemic perspective (Benson et al., 2012; S. D. Davis et al., 2012): both partners are encouraged to take ownership for the issues faced within their relationship, and are coached in navigating them as a team, specifically by helping them improve the ways that they communicate and otherwise interact around PVD, pain, and sex.

Study 3 showed that a couple-based intervention – CBCT – did in fact contribute to improvements in couples approaches to collaborative sexual communication. Thus, helping couples to improve couple-level factors in therapy for PVD, such as adopting more collaborative approaches to sexual communication, appears to be a meaningful component of this intervention. Couples' adoption of more collaborative sexual communication patterns may be facilitated by helping couples communicate about their sexual problems in a more empathic way, such as helping couples become more comfortable with expressing their feelings to one another, and responding to one another's needs with understanding. More broadly, these findings provide further evidence that moving beyond medical treatment approaches, and treating PVD from a biopsychosocial perspective, is of benefit to women with PVD, their romantic partners, and their relationships.

Study 3 also revealed inconsistent results for changes in negative sexual communication patterns, with partners exhibiting significant reductions in the CBCT

condition only, but women with PVD exhibiting significant reductions irrespective of treatment type. These results speak to broader implications for encouraging treatment seeking of any kind for women with PVD. One other study has shown that women with PVD experienced reductions in distress while on the waitlist for a mindfulness-based cognitive therapy (Brotto et al., 2015), which potentially highlights the beneficial role of treatment expectancy effects in this population of women. Thus, an increasingly important clinical endeavour may be to increase awareness of and education concerning PVD to help more women access treatment for this condition without shame and stigma (Nguyen et al., 2013).

6.6 Conclusions

This dissertation demonstrated that dyadic sexual communication, and collaborative and negative sexual communication patterns, were related to multiple aspects of couples' adjustment to PVD, including physiological outcomes (pain and sexual functioning) and psychosocial outcomes (sexual and relationship satisfaction, sexual distress, and depressive symptoms). Additionally, it demonstrated that couple-based CBT intervention for PVD uniquely contributed to improvements in women's and partners' collaborative sexual communication patterns relative to a medical intervention. These findings support the continued investigation of sexual communication, and in particular, collaborative sexual communication patterns, as an important treatment target in psychological interventions for couples coping with this condition. However, longitudinal research is needed to understand the mechanisms by which sexual communication relates to better adjustment, and whether changes in collaborative sexual communication patterns are a potential mechanism of treatment gains in CBCT for PVD.

The specific importance of addressing negative sexual communication patterns through CBCT was less clear, given that women with PVD reported reductions in negative sexual communication patterns in both the medical and CBCT intervention condition. More research is needed to understand the immediate and longitudinal effects of treatment seeking on couples' interpersonal relationships, and to examine the role of negative sexual communication patterns in complex couple presentations (e.g., accompanying relational distress). The numerous future directions for this research indicate that sexual communication is emerging as a relevant treatment target that may facilitate couples' greater well-being in the face of this distressing, intimate pain condition.

REFERENCES

Aikens, J. E., Reed, B. D., Gorenflo, D. W., & Haefner, H. K. (2003). Depressive symptoms among women with vulvar dysesthesia. *American Journal of Obstetrics and Gynecology, 189*(2), 462-466. doi:10.1067/s0002-9378(03)00521-0

APA. (2013). *Diagnostic and statistical manual of mental disorders : DSM-5* (5th ed.). Arlington, Va.: American Psychiatric Association.

Arnold, L. D., Bachmann, G. A., Rosen, R., Kelly, S., & Rhoads, G. G. (2006). Vulvodynia: Characteristics and associations with comorbidities and quality of life. *Obstetrics & Gynecology, 107*(3), 617-624. doi:10.1097/01.AOG.0000199951.26822.27

Arnold, L. D., Bachmann, G. A., Rosen, R., & Rhoads, G. G. (2007). Assessment of vulvodynia symptoms in a sample of US women: A prevalence survey with a nested case control study. *American Journal of Obstetrics & Gynecology, 196*(2), 128 e121-126. doi:10.1016/j.ajog.2006.07.047

Awada, N., Bergeron, S., Steben, M., Hainault, V.-A., & McDuff, P. (2014). To say or not to say: Dyadic ambivalence over emotional expression and its associations with pain, sexuality, and distress in couples coping with provoked vestibulodynia. *The Journal of Sexual Medicine, 11*(5), 1271-1282. doi:10.1111/jsm.12463

Ayling, K., & Ussher, J. M. (2008). "If sex hurts, am I still a woman?" The subjective experience of vulvodynia in hetero-sexual women. *Archives of Sexual Behavior, 37*(2), 294-304. doi:10.1007/s10508-007-9204-1

Babin, E. A. (2013). An examination of predictors of nonverbal and verbal communication of pleasure during sex and sexual satisfaction. *Journal of Social and Personal Relationships, 30*(3), 270-292. doi:10.1177/0265407512454523

Bair, E., Simmons, E., Hartung, J., Desia, K., Maixner, W., & Zolnoun, D. (2015). Natural history of comorbid orofacial pain among women with vestibulodynia. *Clinical Journal of Pain, 31*(1), 73-78. doi:10.1097/AJP.0000000000000087

Basson, R., Berman, J., Burnett, A., Derogatis, L., Ferguson, D., Fourcroy, J., . . . Whipple, B. (2000). Report of the International Consensus Development Conference on female sexual dysfunction: Definitions and classifications. *The Journal of Urology, 163*(3), 888-893. doi:http://dx.doi.org/10.1016/S0022-5347(05)67828-7

Baucom, B., Eldridge, K., Jones, J., Sevier, M., Clements, M., Markman, H., . . . Christensen, A. (2007). Relative contributions of relationship distress and depression to communication patterns in couples. *Journal of Social and Clinical Psychology, 26*(6), 689-707. doi:10.1521/jscp.2007.26.6.689

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.

Benson, L. A., McGinn, M. M., & Christensen, A. (2012). Common principles of couple therapy. *Behavior Therapy, 43*(1), 25-35. doi:10.1016/j.beth.2010.12.009

Berg, C. A., & Upchurch, R. (2007). A developmental-contextual model of couples coping with chronic illness across the adult life span. *Psychological Bulletin, 133*(6), 920-954. doi:10.1037/0033-2909.133.6.920

Bergeron, S., Binik, Y. M., Khalife, S., Pagidas, K., & Glazer, H. I. (2001). Vulvar vestibulitis syndrome: Reliability of diagnosis and evaluation of current diagnostic criteria. *Obstetrics & Gynecology, 98*(1), 45-51.

Bergeron, S., Binik, Y. M., Khalife, S., Pagidas, K., Glazer, H. I., Meana, M., & Amsel, R. (2001). A randomized comparison of group cognitive--behavioral therapy, surface electromyographic biofeedback, and vestibulectomy in the treatment of dyspareunia resulting from vulvar vestibulitis. *Pain, 91*(3), 297-306.

Bergeron, S., Corsini-Munt, S., Aerts, L., Rancourt, K., & Rosen, N. O. (2015). Female sexual pain disorders: A review of the literature on etiology and treatment. *Current Sexual Health Reports, 7*(3), 159-169. doi:10.1007/s11930-015-0053-y

Bergeron, S., Khalife, S., Dupuis, M. J., & McDuff, P. (2016). A randomized clinical trial comparing group cognitive-behavioral therapy and a topical steroid for women with dyspareunia. *Journal of Consulting and Clinical Psychology, 84*(3), 259-268. doi:10.1037/ccp0000072

Bergeron, S., Khalife, S., Glazer, H. I., & Binik, Y. M. (2008). Surgical and behavioral treatments for vestibulodynia: Two-and-one-half year follow-up and predictors of outcome. *Obstetrics & Gynecology, 111*(1), 159-166. doi:10.1097/01.AOG.0000295864.76032.a7

Bergeron, S., Rosen, N. O., & Morin, M. (2011). Genital pain in women: Beyond interference with intercourse. *Pain, 152*(6), 1223-1225. doi:10.1016/j.pain.2011.01.035

Bodenmann, G. (1995). A systemic-transactional conceptualization of stress and coping in couples. *Swiss Journal of Psychology, 54*(1), 34-49.

Boerner, K., & Rosen, N. O. (2015). Acceptance of vulvovaginal pain in women with provked vestibulodynia and their partners: Associations with pain, psychological, and sexual adjustment. *The Journal of Sexual Medicine, 12*(6), 1450-1462. doi:10.1111/jsm.12889

Bois, K., Bergeron, S., Rosen, N., Mayrand, M. H., Brassard, A., & Sadikaj, G. (2016). Intimacy, sexual satisfaction, and sexual distress in vulvodynia couples: An observational study. *Health Psychology, 35*(6), 531-540. doi:10.1037/hea0000289

Bois, K., Bergeron, S., Rosen, N. O., McDuff, P., & Gregoire, C. (2013). Sexual and relationship intimacy among women with provoked vestibulodynia and their partners: Associations with sexual satisfaction, sexual function, and pain self-efficacy. *Journal of Sexual Medicine, 10*(8), 2024-2035. doi:10.1111/jsm.12210

Bornstein, J., Goldstein, A. T., Stockdale, C. K., Bergeron, S., Pukall, C., Zolnoun, D., . . . Society, t. I. P. P. (2016). 2015 ISSVD, ISSWSH and IPPS Consensus terminology and classification of persistent vulvar pain and vulvodynia. *Obstetrics & Gynecology, 127*(4), 745-751. doi:10.1097/AOG.0000000000001359

Brauer, M., ter Kuile, M. M., Laan, E., & Trimbos, B. (2009). Cognitive-affective correlates and predictors of superficial dyspareunia. *Journal of Sex & Marital Therapy, 35*(1), 1-24. doi:10.1080/00926230802525604

Brotto, L. A., Basson, R., Smith, K. B., Driscoll, M., & Sadownik, L. (2015). Mindfulness-based Group Therapy for Women with Provoked Vestibulodynia. *Mindfulness, 6*(3), 417-432. doi:10.1007/s12671-013-0273-z

Brotto, L. A., Chivers, M. L., Millman, R. D., & Albert, A. (2016). Mindfulness-Based Sex Therapy Improves Genital-Subjective Arousal Concordance in Women With Sexual Desire/Arousal Difficulties. *Archives of Sexual Behavior, 45*(8), 1907-1921. doi:10.1007/s10508-015-0689-8

Brotto, L. A., Sadownik, L. A., Thomson, S., Dayan, M., Smith, K. B., Seal, B. N., . . . Zhang, A. (2014). A comparison of demographic and psychosexual characteristics of women with primary versus secondary provoked vestibulodynia. *The Clinical Journal of Pain, 30*(5), 428-435.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science, 6*(1), 3-5. doi:10.1177/1745691610393980

Cano, A., Barterian, J. A., & Heller, J. B. (2008). Empathic and nonempathic interaction in chronic pain couples. *Clinical Journal of Pain, 24*(8), 678-684. doi:10.1097/AJP.0b013e31816753d8

Cano, A., & Williams, A. C. d. C. (2010). Social interaction in pain: reinforcing pain behaviors or building intimacy? *Pain, 149*(1), 9-11. doi:10.1016/j.pain.2009.10.010

Catania, J. A. (1986). *Help-seeking: An avenue for adult sexual development.* (Unpublished Doctoral Thesis), University of California, San Francisco.

Catania, J. A. (2011). The dyadic sexual communication scale. In T. D. Fisher, C. M. Davis, W. L. Yarber, & S. L. Davis (Eds.), *Handbook of sexuality-related measures* (3rd ed., pp. xxii, 656 p.). New York: Routledge.

Chisari, C., & Chilcot, J. (2017). The experience of pain severity and pain interference in vulvodynia patients: The role of cognitive-behavioural factors, psychological distress and fatigue. *Journal of Psychosomatic Research, 93*, 83-89. doi:10.1016/j.jpsychores.2016.12.010

Christensen, A., Atkins, D. C., Berns, S., Wheeler, J., Baucom, D. H., & Simpson, L. E. (2004). Traditional versus integrative behavioral couple therapy for significantly and chronically distressed married couples. *Journal of Consulting and Clinical Psychology, 72*(2), 176-191. doi:10.1037/0022-006X.72.2.176

Christensen, A., & Shenk, J. L. (1991). Communication, conflict, and psychological distance in nondistressed, clinic, and divorcing couples. *Journal of Consulting and Clinical Psychology, 39*(3), 458-463.

Christensen, A., & Sullaway, M. (1984). *Communication Patterns Questionnaire*. Unpublished questionnaire. University of California. Los Angeles.

Cobia, D. C., Robinson, K., & Edwards, L. (2008). Intimate Partner Violence and Women's Sexual Health: Implications for Couples Therapists. *The Family Journal, 16*(3), 249-253. doi:10.1177/1066480708317670

Coffelt, T. A., & Hess, J. A. (2014). Sexual disclosures: connections to relational satisfaction and closeness. *Journal of Sex & Marital Therapy, 40*(6), 577-591. doi:10.1080/0092623X.2013.811449

Connor, J. J., Robinson, B., & Wieling, E. (2008). Vulvar pain: A phenomenological study of couples in search of effective diagnosis and treatment. *Family Process, 47*(2), 139-155.

Cordova, J. V., Jacobson, N. S., & Christensen, A. (1998). Acceptance versus change interventions in behavioral couple therapy: impact on couples' in-session communication. *Journal of Marital & Family Therapy, 24*(4), 437-455.

Cormier, S., Lavigne, G. L., Choiniere, M., & Rainville, P. (2016). Expectations predict chronic pain treatment outcomes. *Pain, 157*(2), 329-338. doi:10.1097/j.pain.0000000000000379

Corsini-Munt, S., Bergeron, S., Rosen, N. O., Mayrand, M. H., & Delisle, I. (2014). Feasibility and preliminary effectiveness of a novel cognitive-behavioral couple therapy for provoked vestibulodynia: A pilot study. *Journal of Sexual Medicine, 11*(10), 2515-2527. doi:10.1111/jsm.12646

Corsini-Munt, S., Bergeron, S., Rosen, N. O., Steben, M., Mayrand, M. H., Delisle, I., . . . Santerre-Baillargeon, M. (2014). A comparison of cognitive-behavioral couple therapy and lidocaine in the treatment of provoked vestibulodynia: Study protocol for a randomized clinical trial. *Trials, 15*, 506. doi:10.1186/1745-6215-15-506

Crenshaw, A. O., Christensen, A., Baucom, D. H., Epstein, N. B., & Baucom, B. R. (in press). Revised scoring and improved reliability for the Communication Patterns Questionnaire. *Psychological Assessment*.

Cupach, W. R., & Metts, S. (1991). Sexuality and communication in close relationships. In K. McKinney & S. Spreecher (Eds.), *Sexuality in close relationships* (pp. 93-110). Hillsdale, NJ: Lawrence Erlbaum.

Danielsson, I., Torstensson, T., Brodda-Jansen, G., & Bohm-Starke, N. (2006). EMG biofeedback versus topical lidocaine gel: a randomized study for the treatment of women with vulvar vestibulitis. *Acta Obstetricia et Gynecologica Scandinavica, 85*(11), 1360-1367. doi:10.1080/00016340600883401

Davis, D., Shaver, P. R., Widaman, K. F., Vernon, M. L., Follette, W. C., & Beitz, K. (2006). "I can't get no satisfaction": Insecure attachment, inhibited sexual communication, and sexual dissatisfaction. *Personal Relationships, 13*(4), 465-483.

Davis, S. D., Lebow, J. L., & Sprenkle, D. H. (2012). Common factors of change in couple therapy. *Behaviour Therapy, 43*(1), 36-48. doi:10.1016/j.beth.2011.01.009

Derogatis, L., Clayton, A., Lewis-D'Agostino, D., Wunderlich, G., & Fu, Y. (2008). Validation of the female sexual distress scale-revised for assessing distress in women with hypoactive sexual desire disorder. *Journal of Sexual Medicine, 5*(2), 357-364. doi:10.1111/j.1743-6109.2007.00672.x

Desrochers, G., Bergeron, S., Khalife, S., Dupuis, M. J., & Jodoin, M. (2009). Fear avoidance and self-efficacy in relation to pain and sexual impairment in women with provoked vestibulodynia. *Clinical Journal of Pain, 25*(6), 520-527.

Desrochers, G., Bergeron, S., Khalife, S., Dupuis, M. J., & Jodoin, M. (2010). Provoked vestibulodynia: Psychological predictors of topical and cognitive-behavioral treatment outcome. *Behaviour Research and Therapy, 48*(2), 106-115. doi:10.1016/j.brat.2009.09.014

Desrosiers, M., Bergeron, S., Meana, M., Leclerc, B., Binik, Y. M., & Khalife, S. (2008). Psychosexual characteristics of vestibulodynia couples: Partner solicitousness and hostility are associated with pain. *Journal of Sexual Medicine, 5*(2), 418-427. doi:10.1111/j.1743-6109.2007.00705.x

Dewitte, M. (2014). On the interpersonal dynamics of sexuality. *Journal of Sex & Marital Therapy, 40*(3), 209-232. doi:10.1080/0092623X.2012.710181

Diagnostic and Statistical Manual of Mental Disorders: DSM-5. (2013). American Psychiatric Association.

Diagnostic and Statistical Manual of Mental Disorders: DSM-IV Text Revision. (2000). American Psychiatric Association.

Doss, B. D., Rowe, L. S., Carhart, K., Madsen, J. W., & Georgia, E. J. (2011). Sudden gains in treatment-as-usual couple therapy for military veterans. *Behavior Therapy, 42*(3), 509-520. doi:10.1016/j.beth.2010.12.001

Doss, B. D., Simpson, L. E., & Christensen, A. (2004). Why Do Couples Seek Marital Therapy? *Professional Psychology: Research and Practice, 35*(6), 608-614. doi:10.1037/0735-7028.35.6.608

Doss, B. D., Thum, Y. M., Sevier, M., Atkins, D. C., & Christensen, A. (2005). Improving relationships: mechanisms of change in couple therapy. *Journal of Consulting & Clinical Psychology, 73*(4), 624-633. doi:10.1037/0022-006X.73.4.624

Dunkley, C. R., & Brotto, L. A. (2016). Psychological Treatments for Provoked Vestibulodynia: Integration of Mindfulness-Based and Cognitive Behavioral Therapies. *Journal of Clinical Psychology, 72*(7), 637-650. doi:10.1002/jclp.22286

Fabrigar, L. R., & Wegener, D. T. (2012). *Exploratory factor analysis*. Oxford ; New York: Oxford University Press.

Finkbeiner, N. M., Epstein, N. B., & Falconier, M. K. (2013). Low intimacy as a mediator between depression and clinic couple relationship satisfaction. *Personal Relationships, 20*(3), 406-421. doi:10.1111/j.1475-6811.2012.01415.x

Foster, D. C., Kotok, M. B., Huang, L. S., Watts, A., Oakes, D., Howard, F. M., . . . Dworkin, R. H. (2010). Oral desipramine and topical lidocaine for vulvodynia: a randomized controlled trial. *Obstetrics & Gynecology, 116*(3), 583-593. doi:10.1097/AOG.0b013e3181e9e0ab

Frigon, J., & Laurencelle, L. (1993). Analysis of covariance: A proposed algorithm. *Educational and Psychological Measurement, 53*(1), 1-18. doi:10.1177/0013164493053001001

Funk, J. L., & Rogge, R. D. (2007). Testing the ruler with item response theory: increasing precision of measurement for relationship satisfaction with the Couples Satisfaction Index. *Journal of Family Psychology, 21*(4), 572-583. doi:10.1037/0893-3200.21.4.572

Gilbert, E., Ussher, J. M., & Perz, J. (2008). Renegotiating sexuality and intimacy in the context of cancer: The experiences of carers. *Archives of Sexual Behavior, 39*(4), 998-1009. doi:10.1007/s10508-008-9416-z

Gill, D. S., Christensen, A., & Fincham, F. D. (1999). Predicting marital satisfaction from behavior: Do all roads really lead to Rome? *Personal Relationships, 6*(3), 369-387. doi:DOI 10.1111/j.1475-6811.1999.tb00198.x

Goldin, P. R., Lee, I., Ziv, M., Jazaieri, H., Heimberg, R. G., & Gross, J. J. (2014). Trajectories of change in emotion regulation and social anxiety during cognitive-behavioral therapy for social anxiety disorder. *Behaviour Research & Therapy, 56*, 7-15. doi:10.1016/j.brat.2014.02.005

Goldstein, A. T., Pukall, C. F., Brown, C., Bergeron, S., Stein, A., & Kellogg-Spadt, S. (2016). Vulvodynia: Assessment and treatment. *Journal of Sexual Medicine, 13*(4), 572-590. doi:10.1016/j.jsxm.2016.01.020

Gordon, A. M., & Chen, S. (2016). Do you get where I'm coming from?: Perceived understanding buffers against the negative impact of conflict on relationship satisfaction. *Journal of Personality and Social Psychology, 110*(2), 239-260. doi:10.1037/pspi0000039

Gottman, J. M. (1993). The role of conflict engagement, escalation, and avoidance in marital interaction: A longitudinal view of five types of couples. *Journal of Consulting and Clinical Psychology, 61*(1), 6-15.

Gottman, J. M., & Krokoff, L. J. (1989). Marital interaction and satisfaction: A longitudinal view. *Journal of Consulting and Clinical Psychology, 57*(1), 47-52.

Graber, E. C., Laurenceau, J. P., Miga, E., Chango, J., & Coan, J. (2011). Conflict and love: predicting newlywed marital outcomes from two interaction contexts. *Journal of Family Psychology, 25*(4), 541-550. doi:10.1037/a0024507

Granot, M., & Lavee, Y. (2005). Psychological factors associated with perception of experimental pain in vulvar vestibulitis syndrome. *Journal of Sex & Marital Therapy, 31*(4), 285-302. doi:10.1080/00926230590950208

Greene, K., & Faulkner, S. L. (2005). Gender, Belief in the Sexual Double Standard, and Sexual Talk in Heterosexual Dating Relationships. *Sex Roles, 53*(3-4), 239-251. doi:10.1007/s11199-005-5682-6

Gross, J. J. (1998). The emerging field of emotion regulation. *Review of General Psychology, 2*(3), 271-299.

Gurman, A. S. (2011). Couple therapy research and the practice of couple therapy: can we talk? *Family Process, 50*(3), 280-292. doi:10.1111/j.1545-5300.2011.01360.x

Hajek, A., Bock, J. O., & Konig, H. H. (2017). Association of general psychological factors with frequent attendance in primary care: a population-based cross-sectional observational study. *BMC Family Practice, 18*(1), 48. doi:10.1186/s12875-017-0621-5

Hallam-Jones, R., Wylie, K. R., Osborne-Cribb, J., Harrington, C., & Walters, S. (2001). Sexual difficulties within a group of patients with vulvodynia. *Sexual and Relationship Therapy, 16*(2), 113-126. doi:10.1080/14681990120040050

Harlow, B. L., Kunitz, C. G., Nguyen, R. H., Rydell, S. A., Turner, R. M., & MacLehose, R. F. (2014). Prevalence of symptoms consistent with a diagnosis of vulvodynia: Population-based estimates from 2 geographic regions. *American Journal of Obstetrics & Gynecology, 210*(1), 40 e41-48. doi:10.1016/j.ajog.2013.09.033

Harlow, B. L., & Stewart, E. G. (2003). A population-based assessment of chronic unexplained vulvar pain: have we underestimated the prevalence of vulvodynia? *Journal of the American Medical Womens Association (1972), 58*(2), 82-88.

Harlow, B. L., & Stewart, E. G. (2005). Adult-onset vulvodynia in relation to childhood violence victimization. *American Journal of Epidemiology, 161*(9), 871-880. doi:10.1093/aje/kwi108

Harlow, B. L., Wise, L. A., & Stewart, E. G. (2001). Prevalence and predictors of chronic lower genital tract discomfort. *American Journal of Obstetrics & Gynecology, 185*(3), 545-550. doi:10.1067/mob.2001.116748

Harris, C. A., & D'Eon, J. L. (2008). Psychometric properties of the Beck Depression Inventory--second edition (BDI-II) in individuals with chronic pain. *Pain, 137*(3), 609-622. doi:10.1016/j.pain.2007.10.022

Hayes, R. D., Dennerstein, L., Bennett, C. M., Sidat, M., Gurrin, L. C., & Fairley, C. K. (2008). Risk factors for female sexual dysfunction in the general population: Exploring factors associated with low sexual function and sexual distress. *The Journal of Sexual Medicine, 5*(7), 1681-1693. doi:10.1111/j.1743-6109.2008.00838.x

Hinchliff, S., Gott, M., & Wylie, K. (2012). A qualitative study of heterosexual women's attempts to renegotiate sexual relationships in the context of severe sexual problems. *Archives of Sexual Behavior, 41*(5), 1253-1261. doi:10.1007/s10508-012-9903-0

Hjermstad, M. J., Fayers, P. M., Haugen, D. F., Caraceni, A., Hanks, G. W., Loge, J. H., . . . (EPCRC), E. P. C. R. C. (2011). Studies comparing Numerical Rating Scales, Verbal Rating Scales, and Visual Analogue Scales for assessment of pain intensity in adults: a systematic literature review. *Journal of pain and symptom management, 41*(6), 1073-1093. doi:10.1016/j.jpainsymman.2010.08.016

Holman, T. B., & Jarvis, M. O. (2003). Hostile, volatile, avoiding, and validating couple-conflict types: An investigation of Gottman's couple-conflict types. *Personal Relationships, 10*, 267-282.

Holmberg, D., & Blair, K. (2009). Sexual desire, communication, satisfaction, and preferences of men and women in same-sex versus mixed-sex relationships. *Journal of Sex Research, 46*(1), 57-66. doi:10.1080/00224490802645294

Hurlbert, D. F. (1991). The role of assertiveness in female sexuality: A comparative study between sexually assertive and sexually nonassertive women. *Journal of Sex & Marital Therapy, 17*(3), 183-190. doi:10.1080/00926239108404342

Iglesias-Rios, L., Harlow, S. D., & Reed, B. D. (2015). Depression and posttraumatic stress disorder among women with vulvodynia: Evidence from the population-based woman to woman health study. *Journal of Women's Health, 24*(7), 557-562. doi:10.1089/jwh.2014.5001

Jacobson, N. S., & Addis, M. E. (1993). Research on couples and couple therapy: what do we know? Where are we going? *Journal of Consulting & Clinical Psychology, 61*(1), 85-93.

Jelovsek, J. E., Walters, M. D., & Barber, M. D. (2008). Psychosocial impact of chronic vulvovagina conditions. *The Journal of reproductive medicine, 53*(2), 75-82.

Jodoin, M., Bergeron, S., Khalife, S., Dupuis, M. J., Desrochers, G., & Leclerc, B. (2008). Male partners of women with provoked vestibulodynia: Attributions for pain and their implications for dyadic adjustment, sexual satisfaction, and psychological distress. *Journal of Sexual Medicine, 5*(12), 2862-2870. doi:10.1111/j.1743-6109.2008.00950.x

Johnson, S., & Lebow, J. (2000). The "coming of age" of couple therapy: a decade review. *Journal of Marital & Family Therapy, 26*(1), 23-38.

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review in Clinical Psychology, 3*, 1-27. doi:10.1146/annurev.clinpsy.3.022806.091432

Kazdin, A. E. (2009). Understanding how and why psychotherapy leads to change. *Psychotherapy Research, 19*(4-5), 418-428. doi:10.1080/10503300802448899

Kazdin, A. E. (2016). Evidence-based psychosocial treatment: Advances, surprises, and needed shifts in foci. *Cognitive and Behavioral Practice, 23*, 426-430.

Kelly, M. P., Strassberg, D. S., & Turner, C. M. (2004). Communication and associated relationship issues in female anorgasmia. *Journal of Sex & Marital Therapy, 30*(4), 263-276. doi:10.1080/00926230490422403

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*: Guilford Press.

Khandker, M., Brady, S. S., Stewart, E. G., & Harlow, B. L. (2014). Is chronic stress during childhood associated with adult-onset vulvodynia? *Journal of Women's Health, 23*(8), 649-656. doi:10.1089/jwh.2013.4484

Khandker, M., Brady, S. S., Vitonis, A. F., Maclehose, R. F., Stewart, E. G., & Harlow, B. L. (2011). The influence of depression and anxiety on risk of adult onset vulvodynia. *Journal of Women's Health, 20*(10), 1445-1451. doi:10.1089/jwh.2010.2661

Lambert, M. J., & Shimokawa, K. (2011). Collecting client feedback. *Psychotherapy (Chic), 48*(1), 72-79. doi:10.1037/a0022238

Landry, T., & Bergeron, S. (2011). Biopsychosocial factors associated with dyspareunia in a community sample of adolescent girls. *Archives of Sexual Behavior, 40*(5), 877-889. doi:10.1007/s10508-010-9637-9

Laurenceau, J. P., Hayes, A. M., & Feldman, G. C. (2007). Some methodological and statistical issues in the study of change processes in psychotherapy. *Clinical Psychology Review, 27*(6), 682-695. doi:10.1016/j.cpr.2007.01.007

Lawrance, K. A., & Byers, E. S. (1995). Sexual satisfaction in long‐term heterosexual relationships: The interpersonal exchange model of sexual satisfaction. *Personal Relationships, 2*(4), 267-285. doi:10.1111/j.1475-6811.1995.tb00092.x

Leclerc, B., Bergeron, S., Brassard, A., Belanger, C., Steben, M., & Lambert, B. (2015). Attachment, sexual assertiveness, and sexual outcomes in women with provoked vestibulodynia and their partners: A mediation model. *Archives of Sexual Behavior, 44*(6), 1561-1572. doi:10.1007/s10508-014-0295-1

Leonard, M. T., Cano, A., & Johansen, A. B. (2006). Chronic pain in a couples context: A review and integration of theoretical models and empirical evidence. *Journal of Pain, 7*(6), 377-390. doi:10.1016/j.jpain.2006.01.442

Leong, L. E., Cano, A., & Johansen, A. B. (2011). Sequential and base rate analysis of emotional validation and invalidation in chronic pain couples: Patient gender matters. *Journal of Pain, 12*(11), 1140-1148. doi:10.1016/j.jpain.2011.04.004

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198-1202. doi:10.1080/01621459.1988.10478722

Litzinger, S., & Gordon, K. C. (2005). Exploring Relationships Among Communication, Sexual Satisfaction, and Marital Satisfaction. *Journal of Sex & Marital Therapy, 31*(5), 409-424. doi:10.1080/00926230591006719

MacNeil, S., & Byers, E. S. (2005). Dyadic assessment of sexual self-disclosure and sexual satisfaction in heterosexual dating couples. *Journal of Social and Personal Relationships, 22*(2), 169-181. doi:10.1177/0265407505050942

MacNeil, S., & Byers, E. S. (2009). Role of sexual self-disclosure in the sexual satisfaction of long-term heterosexual couples. *Journal of Sex Research, 46*(1), 3-14. doi:10.1080/00224490802398399

Manne, S. L., & Badr, H. (2008). Intimacy and relationship processes in couples' psychosocial adaptation to cancer. *Cancer, 112*(11 Suppl), 2541-2555. doi:10.1002/cncr.23450

Manne, S. L., Ostroff, J. S., Norton, T. R., Fox, K., Goldstein, L., & Grana, G. (2006). Cancer-related relationship communication in couples coping with early stage breast cancer. *Psycho-Oncology, 15*(3), 234-247. doi:10.1002/pon.941

Mark, K. P., Herbenick, D., Fortenberry, J. D., Sanders, S., & Reece, M. (2014). A Psychometric Comparison of Three Scales and a Single-Item Measure to Assess Sexual Satisfaction. *Journal of Sex Research, 51*(2), 159-169. doi:10.1080/00224499.2013.816261

Mark, K. P., & Jozkowski, K. N. (2013). The mediating role of sexual and nonsexual communication between relationship and sexual satisfaction in a sample of college-age heterosexual couples. *Journal of Sex & Marital Therapy, 39*(5), 410-427. doi:10.1080/0092623X.2011.644652

Marriott, C., & Thompson, A. R. (2008). Managing threats to femininity: Personal and interpersonal experience of living with vulval pain. *Psychology & Health, 23*(2), 243-258. doi:10.1080/14768320601168185

Masheb, R. M., Kerns, R. D., Lozano, C., Minkin, M. J., & Richman, S. (2009). A randomized clinical trial for women with vulvodynia: Cognitive-behavioral therapy vs. supportive psychotherapy. *Pain, 141*(1-2), 31-40. doi:10.1016/j.pain.2008.09.031

Masheb, R. M., Lozano-Blanco, C., Kohorn, E. I., Minkin, M. J., & Kerns, R. D. (2004). Assessing sexual function and dyspareunia with the Female Sexual Function Index (FSFI) in women with vulvodynia. *Journal of Sex & Marital Therapy, 30*(5), 315-324. doi:10.1080/00926230490463264

Masheb, R. M., Wang, E., Lozano, C., & Kerns, R. D. (2005). Prevalence and correlates of depression in treatment-seeking women with vulvodynia. *Journal of Obstetrics and Gynaecology, 25*(8), 786-791. doi:10.1080/01443610500328199

Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavioral Research Methods, 44*(1), 1-23. doi:10.3758/s13428-011-0124-6

McNulty, J. K., & Fincham, F. D. (2012). Beyond positive psychology? Toward a contextual view of psychological processes and well-being. *American Psychologist, 67*(2), 101-110. doi:10.1037/a0024572

Meana, M., Binik, Y. M., Khalife, S., & Cohen, D. R. (1997). Biopsychosocial profile of women with dyspareunia. *Obstetrics & Gynecology, 90*(4), 583-589.

Metz, M. E., & Epstein, N. (2002). Assessing the role of relationship conflict in sexual dysfunction. *Journal of Sex & Marital Therapy, 28*(2), 139-164. doi:10.1080/00926230252851889

Meyer-Bahlburg, H. F., & Dolezal, C. (2007). The female sexual function index: a methodological critique and suggestions for improvement. *Journal of Sex & Marital Therapy, 33*(3), 217-224. doi:10.1080/00926230701267852

Mitchell, K. R., Mercer, C. H., Ploubidis, G. B., Jones, K. G., Datta, J., Field, N., . . . Wellings, K. (2013). Sexual function in Britain: findings from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *Lancet, 382*(9907), 1817-1829. doi:10.1016/S0140-6736(13)62366-1

Montesi, J. L., Fauber, R. L., Gordon, E. A., & Heimberg, R. G. (2011). The specific importance of communicating about sex to couples' sexual and overall relationship satisfaction. *Journal of Social and Personal Relationships, 28*(5), 591-609. doi:10.1177/0265407510386833

Morokoff, P. J., Quina, K., Harlow, L. L., Whitmire, L., Grimley, D. M., Gibson, P. R., & Burkholder, G. J. (1997). Sexual assertiveness scale (SAS) for women: Development and validation. *Journal of Personality and Social Psychology, 73*(4), 790-804. doi:10.1037/0022-3514.73.4.790

Muthén, L. K., & Muthén, B. O. (2014). *Mplus User's Guide*. Los Angeles, CA: Muthén & Muthén.

Nguyen, R. H., Ecklund, A. M., Maclehose, R. F., Veasley, C., & Harlow, B. L. (2012). Co-morbid pain conditions and feelings of invalidation and isolation among women with vulvodynia. *Psychology, Health & Medicine, 17*(5), 589-598. doi:10.1080/13548506.2011.647703

Nguyen, R. H., Turner, R. M., Rydell, S. A., Maclehose, R. F., & Harlow, B. L. (2013). Perceived stereotyping and seeking care for chronic vulvar pain. *Pain Medicine, 14*(10), 1461-1467. doi:10.1111/pme.12151

Nylanderlundqvist, E., & Bergdahl, J. (2003). Vulvar vestibulitis: Evidence of depression and state anxiety in patients and partners. *Acta dermato-venereologica, 83*(5), 369-373.

Osgarby, S. M., & Halford, W. K. (2013). Couple relationship distress and observed expression of intimacy during reminiscence about positive relationship events. *Behavior Therapy, 44*(4), 686-700. doi:10.1016/j.beth.2013.05.003

Overall, N. C., & Hammond, M. D. (2013). Biased and accurate: depressive symptoms and daily perceptions within intimate relationships. *Personality and Social Psychology Bulletin, 39*(5), 636-650. doi:10.1177/0146167213480188

Payne, K. A., Binik, Y. M., Amsel, R., & Khalife, S. (2005). When sex hurts, anxiety and fear orient attention towards pain. *European Journal of Pain, 9*(4), 427-436. doi:10.1016/j.ejpain.2004.10.003

Payne, K. A., Binik, Y. M., Pukall, C. F., Thaler, L., Amsel, R., & Khalife, S. (2007). Effects of sexual arousal on genital and non-genital sensation: a comparison of women with vulvar vestibulitis syndrome and healthy controls. *Archives of Sexual Behavior, 36*(2), 289-300. doi:10.1007/s10508-006-9089-4

Pazmany, E., Bergeron, S., Verhaeghe, J., Van Oudenhove, L., & Enzlin, P. (2014). Sexual communication, dyadic adjustment, and psychosexual well-being in premenopausal women with self-reported dyspareunia and their partners: A controlled study. *Journal of Sexual Medicine, 11*(7), 1786-1797. doi:10.1111/jsm.12518

Pazmany, E., Bergeron, S., Verhaeghe, J., Van Oudenhove, L., & Enzlin, P. (2015). Dyadic sexual communication in pre-menopausal women with self-reported dyspareunia and their partners: Associations with sexual function, sexual distress and dyadic adjustment. *Journal of Sexual Medicine, 12*(2), 516-528. doi:10.1111/jsm.12787

Perrone-McGovern, K. M., Oliveira-Silva, P., Simon-Dack, S., Lefdahl-Davis, E., Adams, D., McConnell, J., . . . Goncalves, O. F. (2014). Effects of empathy and conflict resolution strategies on psychophysiological arousal and satisfaction in romantic relationships. *Appl Psychophysiol Biofeedback, 39*(1), 19-25. doi:10.1007/s10484-013-9237-2

Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interaction effects in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics, 31*, 437-448.

Pukall, C. F., Goldstein, A. T., Bergeron, S., Foster, D., Stein, A., Kellogg-Spadt, S., & Bachmann, G. (2016). Vulvodynia: Definition, prevalence, impact, and pathophysiological factors. *Journal of Sexual Medicine, 13*(3), 291-304. doi:10.1016/j.jsxm.2015.12.021

Rancourt, K. M., Flynn, M., Bergeron, S., & Rosen, N. O. (2017). It Takes Two: Sexual Communication Patterns and the Sexual and Relational Adjustment of Couples Coping With Provoked Vestibulodynia. *Journal of Sexual Medicine, 14*(3), 434-443. doi:10.1016/j.jsxm.2017.01.009

Rancourt, K. M., & Rosen, N. (2016). *The Sexual Communication Patterns Questionnaire - Psychometric Data*. Unpublished raw data.

Rancourt, K. M., Rosen, N. O., Bergeron, S., & Nealis, L. J. (2016). Talking About Sex When Sex Is Painful: Dyadic Sexual Communication Is Associated With Women's Pain, and Couples' Sexual and Psychological Outcomes in Provoked Vestibulodynia. *Archives of Sexual Behavior, 45*(8), 1933-1944. doi:10.1007/s10508-015-0670-6

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks: Sage Publications.

Raudenbush, S. W., Bryk, A. S., & Congdon, R. (2013). HLM 7.01 for Windows [Computer software]. Skokie, IL: Scientific Software International, Inc.

Reed, B. D., Haefner, H. K., Harlow, S. D., Gorenflo, D. W., & Sen, A. (2006). Reliability and validity of self-reported symptoms for predicting vulvodynia. *Obstetrics & Gynecology, 108*(4), 906-913.

Reed, B. D., Harlow, S. D., Sen, A., Edwards, R. M., Chen, D., & Haefner, H. K. (2012). Relationship between vulvodynia and chronic comorbid pain conditions. *Obstetrics & Gynecology, 120*(1), 145-151. doi:10.1097/AOG.0b013e31825957cf

Reed, B. D., Harlow, S. D., Sen, A., Legocki, L. J., Edwards, R. M., Arato, N., & Haefner, H. K. (2012). Prevalence and demographic characteristics of vulvodynia in a population-based sample. *American Journal of Obstetrics & Gynecology, 206*(2), 170 e171-179. doi:10.1016/j.ajog.2011.08.012

Reed, R. G., Butler, E. A., & Kenny, D. A. (2013). Dyadic models for the study of health. *Social and Personality Psychology Compass, 7*(4), 228-245. doi:10.1111/spc3.12022

Rehman, U. S., Janssen, E., Newhouse, S., Heiman, J., Holtzworth-Munroe, A., Fallis, E., & Rafaeli, E. (2011). Marital satisfaction and communication behaviors during sexual and nonsexual conflict discussions in newlywed couples: A pilot study. *Journal of Sex & Marital Therapy, 37*(2), 94-103. doi:10.1080/0092623X.2011.547352

Rehman, U. S., Rellini, A. H., & Fallis, E. (2011). The importance of sexual self-disclosure to sexual satisfaction and functioning in committed relationships. *Journal of Sexual Medicine, 8*, 3108-3115. doi:10.1111/j.1743-6109.2011.02439.x

Rosen, N. O., Bergeron, S., Glowacka, M., Delisle, I., & Baxter, M.-L. (2012). Harmful or helpful: Perceived solicitous and facilitative partner responses are differentially associated with pain and sexual satisfaction in women with provoked vestibulodynia. *The Journal of Sexual Medicine, 9*(9), 2351-2360. doi:10.1111/j.1743-6109.2012.02851.x

Rosen, N. O., Bergeron, S., Glowacka, M., Delisle, I., & Baxter, M. L. (2012). Harmful or helpful: Perceived solicitous and facilitative partner responses are differentially associated with pain and sexual satisfaction in women with provoked vestibulodynia. *Journal of Sexual Medicine, 9*(9), 2351-2360. doi:10.1111/j.1743-6109.2012.02851.x

Rosen, N. O., Bergeron, S., Leclerc, B., Lambert, B., & Steben, M. (2010). Woman and partner-perceived partner responses predict pain and sexual satisfaction in provoked vestibulodynia (PVD) couples. *The Journal of Sexual Medicine, 7*(11), 3715-3724. doi:10.1111/j.1743-6109.2010.01957.x

Rosen, N. O., Bergeron, S., Sadikaj, G., & Delisle, I. (2015). Daily associations among male partner responses, pain during intercourse, and anxiety in women with vulvodynia and their partners. *The Journal of Pain, 16*(12), 1312-1320. doi:10.1016/j.jpain.2015.09.003

Rosen, N. O., Bergeron, S., Sadikaj, G., Glowacka, M., Baxter, M. L., & Delisle, I. (2014). Relationship satisfaction moderates the associations between male partner responses and depression in women with vulvodynia: A dyadic daily experience study. *Pain, 155*(7), 1374-1383. doi:10.1016/j.pain.2014.04.017

Rosen, N. O., Bergeron, S., Sadikaj, G., Glowacka, M., Delisle, I., & Baxter, M. L. (2014). Impact of male partner responses on sexual function in women with vulvodynia and their partners: a dyadic daily experience study. *Health Psychology, 33*(8), 823-831. doi:10.1037/a0034550

Rosen, N. O., Bois, K., Mayrand, M. H., Vannier, S., & Bergeron, S. (2016). Observed and perceived disclosure and empathy are associated with better relationship adjustment and quality of life in couples coping with vulvodynia. *Archives of Sexual Behavior, 45*(8), 1945-1956. doi:10.1007/s10508-016-0739-x

Rosen, N. O., Muise, A., Bergeron, S., Delisle, I., & Baxter, M. L. (2015). Daily associations between partner responses and sexual and relationship satisfaction in couples coping with provoked vestibulodynia. *Journal of Sexual Medicine, 12*(4), 1028-1039. doi:10.1111/jsm.12840

Rosen, N. O., Muise, A., Bergeron, S., Impett, E. A., & Boudreau, G. K. (2015). Approach and Avoidance Sexual Goals in Couples with Provoked Vestibulodynia: Associations with Sexual, Relational, and Psychological Well-Being. *Journal of Sexual Medicine, 12*(8), 1781-1790. doi:10.1111/jsm.12948

Rosen, N. O., Rancourt, K. M., Corsini-Munt, S., & Bergeron, S. (2014). Beyond a "woman's problem": The role of relationship processes in female genital pain. *Current Sexual Health Reports, 6*(1), 1-10. doi:10.1007/s11930-013-0006-2

Rosen, N. O., Santos-Iglesias, P., & Byers, E. S. (2016). Understanding the Sexual Satisfaction of Women With Provoked Vestibulodynia and Their Partners: Comparison With Matched Controls. *Journal of Sex & Marital Therapy*, 1-13. doi:10.1080/0092623X.2016.1263705

Rosen, R. C., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., . . . D'Agostino, R. (2000). The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex & Marital Therapy, 26*(2), 191-208. doi:10.1080/009262300278597

Rosen, R. C., Riley, A., Wagner, G., Osterloh, I. H., Kirkpatrick, J., & Mishra, A. (1997). The international index of erectile function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology, 49*(6), 822-830.

Rosenthal, R., & Rosnow, R. L. (2007). *Essentials of behavioral research: Methods and data analysis* (3rd ed.). New York, NY: McGraw-Hill.

Russell, D. W. (2002). In Search of Underlying Dimensions: The Use (and Abuse) of Factor Analysis in Personality and Social Psychology Bulletin. *Personality and Social Psychology Bulletin, 28*(12), 1629-1646. doi:10.1177/014616702237645

Sadownik, L. A., Smith, K. B., Hui, A., & Brotto, L. A. (2016). The impact of a woman's dyspareunia and Its treatment on her intimate partner: A qualitative analysis. *Journal of Sex & Marital Therapy*, 1-14. doi:10.1080/0092623X.2016.1208697

Sanford, K. (2003). Problem–solving conversations in marriage: Does it matter what topics couples discuss? *Personal Relationships, 10*(1), 97-112. doi:10.1111/1475-6811.00038

Scheffer, J. (2002). Dealing with missing data. *Research Letters in the Information and Mathematical Sciences, 3*, 153-160.

Schover, L. R., Youngs, D. D., & Cannata, R. (1992). Psychosexual aspects of the evaluation and management of vulvar vestibulitis. *American Journal of Obstetrics and Gynecology, 167*(3), 630-636.

Schrodt, P., Witt, P. L., & Shimkowski, J. R. (2013). A Meta-Analytical Review of the Demand/Withdraw Pattern of Interaction and its Associations with Individual, Relational, and Communicative Outcomes. *Communication Monographs, 81*(1), 28-58. doi:10.1080/03637751.2013.813632

Sevier, M., Atkins, D. C., Doss, B. D., & Christensen, A. (2015). Up and down or down and up? The process of change in constructive couple behavior during traditional and integrative behavioral couple therapy. *Journal of Marital and Family Therapy, 41*(1), 113-127. doi:10.1111/jmft.12059

Sevier, M., Eldridge, K., Jones, J., Doss, B. D., & Christensen, A. (2008). Observed communication and associations with satisfaction during traditional and integrative behavioral couple therapy. *Behavior Therapy, 39*(2), 137-150. doi:10.1016/j.beth.2007.06.001

Sheppard, C., Hallam-Jones, R., & Wylie, K. (2008). Why have you both come? Emotional, relationship, sexual and social issues raised by heterosexual couples seeking sexual therapy (in women referred to a sexual difficulties clinic with a history of vulval pain). *Sexual and Relationship Therapy, 23*(3), 217-226. doi:10.1080/14681990802227974

Smith, K. B., & Pukall, C. F. (2011). A systematic review of relationship adjustment and sexual satisfaction among women with provoked vestibulodynia. *Journal of Sex Research, 48*(2-3), 166-191. doi:10.1080/00224499.2011.555016

Smith, K. B., & Pukall, C. F. (2014). Sexual function, relationship adjustment, and the relational impact of pain in male partners of women with provoked vulvar pain. *Journal of Sexual Medicine, 11*, 1283-1293. doi:10.1111/jsm.12484

Smith, K. B., Pukall, C. F., & Chamberlain, S. M. (2013). Sexual and relationship satisfaction and vestibular pain sensitivity among women with provoked vestibulodynia. *Journal of Sexual Medicine, 10*(8), 2009-2023. doi:10.1111/jsm.12213

Snyder, D. K., Mangrum, L. F., & Wills, R. M. (1993). Predicting couples' response to marital therapy: a comparison of short- and long-term predictors. *Journal of Consulting & Clinical Psychology, 61*(1), 61-69.

Stephenson, K. R., & Meston, C. M. (2010). Differentiating components of sexual well-being in women: are sexual satisfaction and sexual distress independent constructs? *Journal of Sexual Medicine, 7*(7), 2458-2468. doi:10.1111/j.1743-6109.2010.01836.x

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson/Allyn & Bacon.

Teachman, B. A., Marker, C. D., & Smith-Janik, S. B. (2008). Automatic associations and panic disorder: trajectories of change over the course of treatment. *Journal of Consulting & Clinical Psychology, 76*(6), 988-1002. doi:10.1037/a0013113

ter Kuile, M. M., van Lankveld, J. J., de Groot, E., Melles, R., Neffs, J., & Zandbergen, M. (2007). Cognitive-behavioral therapy for women with lifelong vaginismus: process and prognostic factors. *Behavior Research and Therapy, 45*(2), 359-373. doi:10.1016/j.brat.2006.03.013

ter Kuile, M. M., & Weijenborg, P. T. (2006). A cognitive-behavioral group program for women with vulvar vestibulitis syndrome (VVS): Factors associated with treatment success. *Journal of Sex & Marital Therapy, 32*(3), 199-213. doi:10.1080/00926230600575306

Theiss, J. A. (2011). Modeling dyadic dffects in the associations between relational uncertainty, sexual communication, and sexual satisfaction for husbands and wives. *Communication Research, 38*(4), 565-584. doi:10.1177/0093650211402186

Theiss, J. A., & Estlein, R. (2014). Antecedents and consequences of the perceived threat of sexual communication: A test of the relational turbulence model. *Western Journal of Communication, 78*(4), 404-425. doi:10.1080/10570314.2013.845794

Timm, T. M., & Keiley, M. K. (2011). The effects of differentiation of self, adult attachment, and sexual communication on sexual and marital satisfaction: A path analysis. *Journal of Sex & Marital Therapy, 37*(3), 206-223. doi:10.1080/0092623X.2011.564513

Vlaeyen, J. W., Crombez, G., & Linton, S. J. (2016). The fear-avoidance model of pain. *Pain, 157*(8), 1588-1589. doi:10.1097/j.pain.0000000000000574

Wiegel, M., Meston, C., & Rosen, R. C. (2005). The Female Sexual Function Index (FSFI): Cross-validation and development of clinical cutoff scores. *Journal of Sex & Marital Therapy, 31*(1), 1-20. doi:10.1080/00926230590475206

Wild, D., Grove, A., Martin, M., Eremenco, S., McElroy, S., Verjee-Lorenz, A., . . . Cultural, A. (2005). Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: report of the ISPOR Task Force for Translation and Cultural Adaptation. *Value Health, 8*(2), 94-104. doi:10.1111/j.1524-4733.2005.04054.x

Williamson, H. C., Hanna, M. A., Lavner, J. A., Bradbury, T. N., & Karney, B. R. (2013). Discussion topic and observed behavior in couples' problem-solving conversations: do problem severity and topic choice matter? *Journal of Family Psychology, 27*(2), 330-335. doi:10.1037/a0031534

Woodin, E. M. (2011). A two-dimensional approach to relationship conflict: meta-analytic findings. *Journal of Family Psychology, 25*(3), 325-335. doi:10.1037/a0023791

Wylie, K., Hallam-Jones, R., & Harrington, C. (2009). Psychological difficulties within a group of patients with vulvodynia. *Journal of Psychosomatic Obstetrics & Gynecology, 25*(3-4), 257-265. doi:10.1080/01674820400024463

Zolnoun, D. A., Hartmann, K. E., & Steege, J. F. (2003). Overnight 5% lidocaine ointment for treatment of vulvar vestibulitis. *Obstetrics & Gynecology, 102*(1), 84-87.

APPENDIX A: S-CPQ VALIDATION STUDY

Table 1

Sociodemographic characteristics for the sample (N = 263)

Variable	*M* (range) or *n*	*SD* or %
Gender		
Male	139	52.9
Female	122	46.4
Transgender	2	0.8
Partner's Gender		
Male	120	45.6
Female	143	54.4
Age	30.55 (18-45)	6.59
Education (years)	15.45 (11-25)	2.33
Culture		
Caucasian American	205	77.9
Asian	19	7.2
African American	14	5.3
Other	24	9.6
Annual income		
$0-19,999	29	11.0
$20,000 – 39,999	83	31.6
$40,000 – 59,999	57	21.7
$60,000 – 79,999	47	17.9
$80,000 – 99,999	21	8.0
>$100,000	25	9.5
Relationship status		
Dating, not living together	80	30.4
Dating, living together	85	32.3
Married	98	37.3
Relationship length (months)	70.51 (3-300)	66.18

Table 2

First five observed eigenvalues for S-CPQ measure

Ordinal	Observed Eigenvalue
1	10.11
2	2.49
3	1.36
4	0.75
5	0.66

Table 3

Obliquely rotated factor loadings for the 23 items on the Sexual Communication Patterns Questionnaire

Item Number	Question	Factor 1: Negative	Factor 2: Collaborative	*Mean*	*SD*
10	You criticize, while your partner defends him/herself	**.842**	.036	2.74	2.08
11	Your partner criticizes, while you defend yourself	**.738**	-.054	3.03	2.30
12	Both members threaten each other with negative consequences	**.863**	.064	2.44	1.98
8	You pressure, nag, and demand, while your partner withdraws, becomes silent, and refuses to discuss the sexual problem	**.810**	.006	2.72	2.09
9	Your partner pressures, nags, and demands, while you withdraw, become silent, and refuse to discuss the sexual problem	**.755**	-.023	3.02	2.39
16	Neither partner is giving to the other after the discussion	**.769**	-.136	2.78	2.03
15	Both members withdraw from each other after the discussion	**.740**	-.152	2.89	2.09
6	Both members blame, accuse, and criticize each other	**.737**	-.122	3.05	2.04
20	You feel guilty for what you said/did, while your partner feels hurt	**.683**	.187	4.27	2.68
21	Your partner feels guilty for what he/she said/did, while you feel hurt	**.652**	.251	3.98	2.58
22	You try to be especially nice and act as if things are normal, while your partner acts distant	**.724**	.135	3.94	2.56
23	Your partner tries to be especially nice and acts as if things are normal, while you act distant	**.684**	.115	3.79	2.50
3	You try to start a discussion about the sexual problem while your partner tries to avoid the discussion	**.594**	-.183	3.19	2.18
4	Your partner tries to start a discussion about the sexual	**.494**	-.220	3.17	2.28

	problem while you try to avoid the discussion				
18	Both partners feel that the sexual problem has been solved	-.001	**.849**	6.46	2.01
7	Both members suggest possible solutions and compromises about the sexual problem	.000	**.827**	6.78	1.89
19	After the discussion of the sexual problem, both partners try to be especially nice to each other	.169	**.743**	6.65	1.90
17	Both partners feel the other has understood his/her position	-.043	**.728**	6.54	2.05
5	Both members express feelings to each other	-.078	**.727**	7.17	1.73
13	You express feelings while your partner offers reasons and solutions	.156	**.687**	5.54	2.42
14	Your partner expresses feelings while you offer reasons and solutions	.202	**.672**	5.90	2.30
2	Both members try to discuss the sexual problem	-.059	**.667**	6.57	2.27
1	Both members avoid discussing the sexual problem	**.357**	**-.402**	3.23	2.31

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