Women's Subjective Orgasm Experience over Adulthood, with a Focus on Later Life

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Dedication

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General Abstract

Rather than fading with age, women's sexuality in later life is now being acknowledged as an important and rewarding dimension of health and well-being. Orgasm is central to sexual pleasure, but its subjective experience (SOE) remains poorly understood. Most research has emphasized frequency, dysfunction, or physiology, with limited attention to the psychological, sensory, physical, and relational dimensions of orgasm. Although many older women remain sexually active, the influence of menopause and sexual context (solitary vs. partnered) on SOE has not been examined, and validated measures for older women are lacking. This dissertation addresses these gaps through two complementary studies. Study 1 evaluated the psychometric properties of the Orgasm Rating Scale (ORS) and the Bodily Sensations of Orgasm Scale (BSOS) among pre-, peri-, and post-menopausal women. Factor analyses supported a 10-factor structure for the ORS and a 3-factor structure for the BSOS across solitary and partnered contexts. Measurement invariance testing confirmed that both measures are interpreted consistently across menopausal status groups, supporting their validity for use throughout adulthood. Study 2 applied these measures to compare SOE across adulthood and sexual context, supplemented with qualitative reflections from post-menopausal women. Results showed that post-menopausal women reported fewer physical sensations, yet intensity remained stable across groups. Pre-menopausal women reported greater effort to reach orgasm, and across all groups, partnered orgasms were rated higher than solitary orgasms. Qualitative findings underscored diversity in later-life experiences, challenging assumptions of decline and emphasizing relational and situational influences. Together, these studies validate comprehensive measures of SOE across adulthood and provide new insights into women's orgasm over the lifespan. Clinically, findings highlight the need to distinguish age-related changes from dysfunction and to consider

partner-related factors in assessment. Theoretically, they refine the Multidimensional Model of the SOE and demonstrate the utility of validated measures across adulthood. Societally, they challenge deficit-based narratives of sexual decline and call for strengths-focused perspectives that reflect the diversity of women's sexual realities in later life.

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Use of Artificial Intelligence (AI) Disclaimer

Artificial Intelligence (AI), specifically ChatGPT, was used in a limited and supportive capacity during the later stages of dissertation writing, after the tool became publicly available. Its use was restricted to assisting with grammar, spelling, content flow, and improving the clarity and conciseness of language. AI support was used only for the general abstract, general introduction, the Study 2 introduction and discussion sections, and the general discussion.

No AI assistance was used in the conceptualization, design, analysis, or interpretation of the research. Study 1 was written entirely without the use of AI, and no AI tools were used for the methods or results sections of either study. No generative AI was used and all content reflects the author's original work, analysis, and intellectual contributions.

General Introduction

"la petite mort…"

Climax, finishing, coming, the O-shot, the big O—these are just a few of the many euphemisms for orgasm, a phenomenon that remains exceedingly difficult to define (e.g., da Silva et al., 2023). Although typically described in physiological terms, orgasm also encompasses psychological perceptions, sensations, and evaluations that are often overlooked in research. Even less is known about how the subjective orgasm experience (SOE) may change throughout adulthood for women. As early as the 1960s, Masters and Johnson (1966) acknowledged this complexity and potential for variability, describing female orgasm as "a potpourri of psychophysiological conditions and social influence" (p. 133). Decades later, Masters and Johnson (1981) expanded on this idea, noting that while ageing women may experience changes to their orgasm, their subjective experience of sexual pleasure often remains intact. Since then, however, much of the empirical literature has focused on pre-menopausal women, limiting the generalizability of findings to peri- and post-menopausal populations. Given that ageing and menopause involve interconnected biological, psychological, and social processes, they may influence orgasm in meaningful ways. This dissertation addresses these gaps by examining the SOE across adulthood, with a specific focus on potential changes in later life.

Orgasm

Orgasm has traditionally been described as a series of rhythmic muscular contractions in the genital region, accompanied by the release of sexual tension and a subjective sense of pleasure (Masters & Johnson, 1966). Within their influential sexual response cycle (excitement, plateau, orgasm, resolution), orgasm was positioned as a universal and predictable physiological sequence. This linear framework, while foundational to modern sex research and therapy,

conceptualized orgasm as a biological endpoint largely removed from psychosocial contexts. Subsequent theoretical and feminist critiques have challenged this reductionist viewpoint. The "New View" of female sexual response (Tiefer, 2001) argued that traditional response models were male-centric and overly focused on genital functioning and performance-oriented sexuality. By privileging orgasm as the defining marker of sexual success, these models minimized variability and obscured the sociocultural meanings and interpersonal dynamics that shape women's sexual experiences. From this perspective, orgasm is not an inevitable physiological reflex but a phenomenon within relational contexts and informed by cultural norms and subjective interpretation (Tiefer, 2001).

Extending this critique, Basson's (2000) Circular Model of Sexual Response proposed a nonlinear, biopsychosocial framework in which orgasm is neither obligatory nor necessarily central to sexual satisfaction. Rather than positioning orgasm as the defining goal of sexual activity, the model conceptualizes it as one of several potential outcomes, shaped by contextual factors such as emotional intimacy, relational security, health status, and motivational processes. Sexual engagement may therefore be initiated and maintained for reasons beyond orgasm attainment, including the pursuit of closeness, bonding, or emotional connection.

From a physiological perspective, female orgasm can be initiated through different forms of stimulation, including clitoral, vaginal, and non-genital zones (e.g., neck; Bischof-Campbell et al., 2019; Herbenick & Fortenberry, 2011; Komisaruk & Whipple, 2011; Levin, 2014). Clitoral stimulation is the most consistent method for eliciting orgasm, and orgasms occur more frequently during intercourse when external stimulation is included, compared to penetration alone (Darling et al., 1991; Herbenick et al., 2018; Hite, 2004; Mahar et al., 2020; Masters & Johnson, 1966; McElroy & Perry, 2024; Salisbury & Fisher, 2014; Shirazi et al., 2018). Some

researchers propose a clitoris-urethra-vagina complex (i.e., previously referred to as the "G-Spot"; Grafenberg, 1950; Whipple & Komisaruk, 1999), located within the urethrovaginal space, as central to vaginal orgasm (Foldes & Buisson, 2009; O'Connell et al., 2005), though distinctions between orgasm types remain controversial (Giovanni et al., 2019; Mollaioli et al., 2021).

Historically, research on female orgasm has focused on three domains: occurrence, which is often measured in terms of frequency or capacity, and dysfunction, particularly in the context of difficulty reaching orgasm or dissatisfaction with the experience, and physiological mechanisms, including hormonal, neural, and reproductive roles. While the male orgasm is biologically essential for reproduction, the functional purpose of the female orgasm remains debated. A few proposed theories include reproductive facilitation (Custers et al., 2009; King et al., 2016; Prause, 2011), pair bonding (Coria-Avila et al., 2016), partner selection (Gallup et al., 2014), and enhanced male partner gratification (Coria-Avila et al., 2016; Harris et al., 2019; Pavlicev & Wagner, 2016). While these approaches have advanced our understanding of sexual function, they offer limited insight into the subjective dimensions of orgasm, which are critical to fully understanding women's sexual experiences.

Subjective Orgasm Experience (SOE)

The SOE refers to the psychological appraisal of orgasm, focusing on how individuals interpret and evaluate their experience rather than interpretations of the experience through biometric measurements (e.g., vaginal and clitoral photoplethysmography; Mah & Binik, 2001, 2005; Suschinsky et al., 2019). Psychologically, SOE encompasses cognitive, emotional, sensory, and physiological responses that range from contentment and "endorphined bliss"

(Khajehei & Behroozpour, 2018; Meston et al., 2004; Rokade, 2011), to dissatisfaction or pain, as in dysorgasmia (Beerten & Coteur, 2024; Chadwick et al., 2019).

To capture this multifaceted experience, Mah and Binik (2002) developed the Multidimensional Model of the Subjective Orgasm Experience (MMSOE). This model characterizes orgasm across two primary domains: cognitive-affective (pleasurable satisfaction, ecstasy, emotional intimacy, relaxation) and sensory (building, flooding, flushing, shooting, throbbing sensations, and general spasms). The MMSOE acknowledges that orgasmic experience is not uniform but varies across individuals and contexts, and within the same individual over time (King et al., 2011; Mah & Binik, 2002). While initially focused on cognitive-affective and sensory dimensions, recent expansions of the model have called for greater integration of bodily and physiological sensations, such as muscular contractions and cardiovascular responses, to enrich further the understanding of SOE (Dubray et al., 2017; King et al., 2011; Webb et al., 2022). While this research provides a broader understanding of the factors that influence women's sexuality in general, studies specifically examining the factors that shape women's SOE remain limited.

Influences on Women's Sexuality and Orgasm

Understanding the complexity of women's orgasm experiences requires attention to the psychosocial, relational, and biological factors that shape sexuality and meaning across contexts. Evidence of substantial variation in women's sexual experiences across adulthood (Bell et al., 2017) highlights the value of a biopsychosocial approach to sexuality across the lifespan.

Psychosocial and Relational

Women's sexual experiences are shaped by a complex interplay of psychosocial and relational factors, including cultural norms, demographic characteristics, personal attitudes,

relationship dynamics, and internalized beliefs about gender and sexuality. These influences emphasize the variability in individual experiences and highlight the importance of considering personal, interpersonal, and sociocultural contexts when examining women's sexuality and orgasm (Basson et al., 2004; Rosen & Beck, 1988).

Sociodemographic and Cultural. Education, religiosity, sexual orientation, and culture have all been linked to differences in orgasm frequency and sexual satisfaction. Higher levels of education and low levels of religiosity have been associated with greater orgasm frequency (excluding individuals aged 65+; Fisher, 1973; González et al., 2006; Kinsey et al., 1953; Laumann et al., 1994; Mah & Binik, 2001). This relationship is hypothesized to reflect more liberal sexual attitudes and reduced sexual shame among individuals in these groups (Frederick et al., 2018; Herbenick et al., 2018; Kontula & Miettinen, 2016; Woo et al., 2011).

Lesbian women consistently report more frequent and reliable orgasms compared to heterosexual and bisexual women (Blair et al., 2018; Coleman et al., 1983; Frederick et al., 2018; Garcia et al., 2014; Gesselman et al., 2024; Holmberg & Blair, 2009). This difference has been attributed to reduced adherence to heteronormative sexual scripts, participation in a turn-taking culture that emphasizes mutual pleasure, greater focus on clitoral stimulation, and a shared understanding of the female body (Blair et al., 2018; Frederick et al., 2018; Gesselman et al., 2024).

Cultural and societal views play an important role in shaping how women experience and interpret their sexuality and orgasm. Norms surrounding gender, pleasure, and sexual behaviour can either support or hinder women's sexual agency. In cultures that affirm female sexual pleasure, women are more likely to report satisfying sexual experiences and frequent orgasms (e.g., Mundugumor and Mangaia societies in Papua New Guinea and the Cook Islands;

Herbenick et al., 2010, 2018; Levin, 1981; Marshall, 1971; Mead, 1949). In contrast, restrictive environments that uphold gendered double standards or emphasize male sexual entitlement are associated with lower orgasm frequency among women and contribute to the persistent "orgasm gap," particularly in heterosexual contexts (Fahs & Frank, 2014; Frederick et al., 2018; Mahar et al., 2020; Mintz, 2017). This gap has been documented as a lifelong issue, with women consistently reporting lower orgasm frequency than men (Andrejek & Fetner, 2019; Gesselman et al., 2024; McElroy & Perry, 2024; Niineste, 2022; Wetzel et al., 2024).

These differences are perpetuated by gendered sexual scripts that prioritize and reward male pleasure, while women are positioned as gatekeepers, with their sexual exploration often judged negatively (Armstrong et al., 2014; Benoit & Ronis, 2022; Farvid et al., 2017; Masters et al., 2013). These scripts diminish women's sexual autonomy and impact the quality of their orgasm experiences (Armstrong et al., 2014; Mahar et al., 2020). The benchmark for a satisfactory sexual experience for women is often low, focusing primarily on the absence of adverse outcomes such as pain or degradation, rather than on the presence of pleasure and orgasm (Mahar et al., 2020; McClelland, 2009).

Psychological and Intrapersonal. Individual traits and attitudes also play a vital role in shaping women's sexual experiences. Positive attitudes toward sex and masturbation (Herbenick et al., 2019), lower levels of sexual guilt (Higgins et al., 2010), and higher sexual self-esteem are all associated with greater orgasm frequency and satisfaction (Mah & Binik, 2001; Rausch & Rettenberger, 2021). Psychological traits such as neuroticism and self-consciousness can disrupt arousal and orgasm (Daspe et al., 2015; McNulty et al., 2016; Rausch & Rettenberger, 2021), while practices like mindfulness have been shown to enhance sexual experiences through present-moment awareness and reduced self-judgment (Adam et al., 2015; McNulty et al., 2016).

Body image can strongly influence sexual satisfaction and orgasm. Women tend to experience greater body dissatisfaction and self-consciousness during sex than men (Peplau et al., 2009), often due to internalized thin ideals and appearance-related stigma (Frederick et al., 2016; 2016; Schaefer et al., 2015). This dissatisfaction can cause cognitive distraction, which disrupts arousal and reduces orgasm frequency and satisfaction (Quinn-Nilas et al., 2016; Satinsky et al., 2012). In contrast, body appreciation is linked to higher sexual satisfaction and function (Robbins & Reissing, 2018).

Relational: Solitary and Partnered Contexts. Orgasm experiences may differ between solitary and partner sexual contexts. These differences may encompass physical sensations, emotional and/or psychological dimensions, and the presence or absence of relationship influences. The literature reflects some discrepancy, although most researchers suggested that solitary orgasm was perceived as more *physically* satisfying or intense, whereas partnered orgasm was described as more strongly associated with *psychological* satisfaction or intensity.

Solitary. Solitary orgasm is described as an erotic self-stimulation without the presence or participation of another person (i.e., masturbation; Kirschbaum & Peterson, 2018). Solitary orgasm is a self-directed and generally dependable source of sexual pleasure because it allows individuals to focus entirely on their own desires and sensations (Cervilla et al., 2024). Masturbation facilitates bodily awareness and sexual learning, and is used as a therapeutic strategy for treating female orgasmic disorder (Renshaw, 1981; Zamboni & Crawford, 2003). Owing to the "orgasm gap", a number of studies reported that heterosexual women rate orgasm consistency (Richters et al., 2006; Zietsch et al., 2011), frequency and satisfaction (Dixon et al., 2024) significantly higher for solitary as compared to partnered sexual interactions. In contrast, lesbian women do not report this discrepancy (Macedo et al., 2023; McElroy & Perry, 2024).

Solitary orgasms are sometimes reported as preferable because they grant a more profound knowledge of women's bodies and sexual preferences (Fahs, 2014). In a qualitative study examining the context and conditions around women's best and most memorable orgasms, conducted with 20 women in the United States (M = 34 years old, SD = 13.35), some women described a sense of transformative embodiment, where they felt wholly present in their bodies and had a sense of losing themselves (Fahs, 2014). They also expressed feeling in control over their sexual exploration and the ways they chose to pursue pleasure (Fahs, 2014). Women emphasized the unique benefit of solitary masturbation including the complete control of all aspects, such as the preferred environment, physical pressure, stimulation, technique, and any adjustments that need to occur can happen instantly, contributing to greater autonomy (i.e., focus on self, sense of freedom, going inwards, self-reliance, complete control), not needing a partner (i.e., practical way to meet own needs when a partner is unavailable, preferring non-partnered activity), and maintenance and emotion regulation (i.e., release of negative physical and emotional feelings; Goldey et al., 2016).

Interestingly, research results are mixed regarding the experience of and preference for solitary orgasms over partnered orgasms. For some, the experience of solitary masturbation has been described as more physiologically intense and pleasurable than orgasms experienced with a partner through penile-vaginal intercourse (Fahs, 2014; Masters & Johnson, 1966), as well as more localized, sharper, and more physically satisfying (Mah & Binik, 2002). In comparison, others regarded partnered orgasms as higher in dimensions of SOE (Arcos-Romero & Sierra, 2022; Mangas et al., 2024; Muñoz-García et al., 2023). Additionally, masturbation-derived orgasms have been rated as less intense, but women reported a preference for these less intense orgasms over the more intense partnered orgasms, reflecting a preference for solitary sexual

activity over partnered sexual activity (Sansone et al., 2024). Of note, older evidence supports that physiologically intense orgasms are more likely to be experienced as more pleasurable and satisfying than less physiologically intense orgasms (i.e., partnered orgasms; Butler, 1976; Clifford, 1978; Davidson & Darling, 1989; Mah & Binik, 2005).

Partnered. Partnered orgasms have been described as deeper, stronger, longer-lasting, and more *psychologically* satisfying than orgasms experienced during solitary masturbation (King et al., 2011; Mah & Binik, 2005). They have also been rated higher on subjective cognitive, affective, reward, and intimacy dimensions (Mangas et al., 2024; Muñoz-García et al., 2023; Sierra et al., 2021). On average, women report experiencing orgasm in 40% to 65% of partnered sexual encounters (Blair et al., 2018; Hurlbert et al., 1993; Singh et al., 1998), with some women identifying their most satisfying orgasms occurring within emotionally intimate, long-term relationships (Fahs, 2014).

A growing body of research supports an interplay between relationship satisfaction, sexual satisfaction, and orgasm. Relationship qualities such as trust, communication, and emotional closeness have been linked to more positive orgasm experiences (King et al., 2011; Mah & Binik, 2002). Orgasm frequency, in particular, is positively associated with overall relationship satisfaction and specific partner-related traits, including accessibility, responsiveness, and emotional engagement (Arcos-Romero & Sierra, 2020; Fraser et al., 2023; Mangas, et al., 2024; Thorpe et al., 2021). These relationship qualities may enhance orgasm directly by increasing emotional intimacy, or indirectly by reducing inhibition and improving sexual communication (Mah & Binik, 2001). Supporting this, Mah and Binik (2002) found that emotional intimacy was rated higher during and after partnered orgasms compared to solitary orgasms. The presence of a trusted partner produces unique emotional and relational dimensions

to orgasm that are often absent in solitary contexts (King et al., 2011; van Anders & Dunn, 2009).

Relationship duration may also impact partnered orgasm experiences, though findings remain mixed. Some studies suggest that longer-term relationships are associated with sexual habituation, reduced novelty, and subsequent declines in sexual desire, orgasm frequency, and overall satisfaction (Klusmann, 2002; Schmiedeberg & Schröder, 2016; Yeh et al., 2006). However, other research suggests that longer relationships may support greater sexual and relationship satisfaction, particularly when couples maintain sexual variety and adjust their sexual priorities over time (Bhat & Shastry, 2019; Fisher, 1973; Frost et al., 2017; Gillespie, 2017; Hinchliff & Gott, 2004; Kinsey et al., 1953; Laumann et al., 1994). Positive outcomes are more likely when long-term partners report increased emotional comfort, mutual trust, and effective communication. These are factors which support greater attunement to each other's preferences, reduced sexual anxiety, and enhanced pleasure (Byers, 2011; Chatterji et al., 2017; Frederick et al., 2018; González et al., 2006; Herbenick et al., 2019; Maxwell et al., 2017; Opperman et al., 2014; Pascoal et al., 2014; Rausch & Rettenberger, 2021).

Research indicates substantial variability in partnered orgasm experiences, and although partnered orgasms are often described as very enjoyable events, research shows that they are not always positive experiences. For instance, King and colleagues (2011) found that partnered orgasms are not always more satisfying than solitary ones. In their study, "good-sex" partnered orgasms were rated highest across dimensions, including pleasure, physical sensations, emotional intimacy, and relationship satisfaction. Solitary orgasms were rated higher than "not-as-good-sex" partnered orgasms in terms of pleasure and sensation, but lower in emotional intimacy and overall intensity compared to "good-sex" orgasms.

Further, van Anders and Dunn (2009) suggested that the presence of a partner can introduce distractions or emotional dynamics that interfere with sensation and focus during sexual activity. Orgasm difficulties in partnered contexts are commonly linked to general stress, low arousal, sex-specific anxiety, and partner-related issues (e.g., habituation, disinterest, mismatched experience levels; Hevesi et al., 2019). Also, relationship factors such as lack of mutual participation, limited arousal awareness, and poor communication of sexual preferences have been reported as potential contributors to orgasm variability (Adams et al., 1985; Fisher, 1973; Hoon & Hoon, 1978; Hurlbert, 1991; Hurlbert et al., 1993; Levin, 2015a; Singh et al., 1998). Researchers Chadwick and colleagues (2019) found that orgasms occurring during verbally coercive encounters, unwanted compliance, or under perceived obligation were described as less pleasurable, physically weaker, emotionally detached, or painful. These experiences were also associated with lower relationship satisfaction and poorer psychological and sexual well-being. Other researchers have emphasized that feelings of insecurity, disconnection, or emotional discomfort can diminish the quality of partnered orgasms, whereas empowerment and the ability to assert one's sexual needs can enhance orgasm (Chadwick et al., 2019; Fahs, 2014).

Lastly, sexual orientation can also impact partnered orgasm experiences. For instance, lesbian women consistently report higher rates of orgasm, greater sexual satisfaction, and more diverse sexual practices compared to heterosexual women (Dickman et al., 2024; Frederick et al., 2018, 2021; Macedo et al., 2023). Research suggests that this discrepancy may be due to lesbian women demonstrating better communication, mutual understanding of female anatomy, and reduced reliance on penetration as the primary route to pleasure (Blair & Pukall, 2014; Frederick et al., 2021; Willis et al., 2018). In contrast, heterosexual women often report lower satisfaction

and orgasm frequency, which may be influenced by unequal sexual scripts and persistent gendered dynamics in partnered sex (Bondarchuk-Mclaughlin & Anderson, 2025; Gesselman et al., 2024).

Biological and Physiological

Women's sexual experiences and function are influenced by a range of biological and physiological changes that occur throughout adulthood, particularly during the menopausal transition. Ageing and menopause are consistently associated with declines in various domains of sexual function (Barton & Ganz, 2015; Heidari et al., 2019; Mansfield et al., 2000; Monteleone et al., 2018; Thomas & Thurston, 2016). These changes reflect the broader functional decline across several bodily systems with age, including reproductive, neural, cardiovascular, and endocrine systems.

One of the most prominent biological shifts occurs hormonally. The decline of sex hormones, including estrogen, dehydroepiandrosterone (DHEA), and testosterone, has been linked to reduced sexual functioning and increased risk of developing sexual problems (Davison et al., 2005; Dubinskaya et al., 2021; Riley, 2000; Sarrel, 2000; van Anders & Dunn, 2009). Hormonal changes have also been associated with numerous physiological changes such as decreased vaginal lubrication and genital vasocongestion (i.e., vascular blood flow and blood pressure; Abraham, 1974; Davison et al., 2005; Davison & Davis, 2011; Dennerstein et al., 2005; Gracia et al., 2004; Santoro et al., 2005), dyspareunia (i.e., persistent or recurrent genital pain), increased muscle tension, decreased vaginal expansion (Alexander et al., 2004; Hoch, 1986; Masters & Johnson, 1966; Sherwin, 1991), decreased urethrovaginal space (Giovanni et al., 2019), decreased vulvo-vaginal innervation (Levin, 2015b), decreased neural responses to erotic

stimuli (Archer et al., 2006), and lower sexual desire (Bachmann & Leiblum, 1991; van Anders & Dunn, 2009).

The hormonal basis of orgasm remains complex. Although findings are mixed concerning the specific roles of estrogen and progesterone in orgasm frequency (Caruso et al., 2014; Krapf & Goldstein, 2024; Meston & Frohlich, 2000; Sayin & Schenck, 2019; Shirazi et al., 2019), research results suggest that oxytocin and testosterone may have a more significant impact. Higher levels of oxytocin have generally been associated with higher frequency and consistency of orgasm (Blaicher et al., 1999; Carmichael et al., 1994; Veening et al., 2015), while lower testosterone levels have been linked to lower frequency and consistency of orgasm (Davis et al., 2005; Meston & Frohlich, 2000; Nappi et al., 2016; Sayin & Schenck, 2019; Turna et al., 2005; van Anders, 2012).

In addition to hormonal shifts, menopause brings anatomical changes to the genitals and pelvic floor that can affect sexual functioning. Estrogen loss may lead to vulvovaginal atrophy, including thinning of the labia minora, vestibular bulb, and clitoral hood, as well as reduced vaginal epithelial thickness, size, and cervical diameter (Basaran et al., 2008; Suh et al., 2003). Hormone-sensitive clitoral tissues may shrink, exposing the glans and increasing irritation and sensitivity loss (Levin, 2015b). Reduced genital vascularization may also impair engorgement of the vaginal and genital region, clitoral/vaginal sensitivity, lubrication, and sexual excitation (Bancroft, 2005; Cavalcanti et al., 2008; Dubinskaya et al., 2021; Galhardo et al., 2006; Lin et al., 2001; Park et al., 2001; Stika, 2010). Pelvic floor muscle atrophy, of varying severity, may also occur, potentially affecting sexual function (Nappi & Palacios, 2014). Adequate pelvic floor tone and contractility are considered necessary for pleasurable sexual experiences, as they are believed to increase lubrication, vasocongestion, and improve overall sexual function (Citak et

al., 2010; Graber & Kline-Graber, 1979; Kegel, 1952; Nazarpour et al., 2017, 2018; Reider, 2016; Wylie & Levin, 2013).

Non-genital symptoms of menopause, such as vasomotor symptoms (e.g., hot flashes, night sweats), can also negatively affect sexual experiences. Vasomotor symptoms often begin during late peri-menopause and persist into early post-menopause (Soules et al., 2001), with an average duration of approximately seven to nine years (Avis et al., 2014; Freeman et al., 2014). Although some women continue to report persistent vasomotor symptoms into their 70s and 80s, the frequency and severity of symptoms tend to decrease with age for most women (Freeman, 2014; Freeman et al., 2014). Post-menopausal women reported that physical symptoms such as hot flashes, fatigue, weight gain, and body image concerns contributed to negative changes in sexual response and a reduction in the frequency and enjoyment of sexual activity (Mansfield et al., 2000). Hot flashes, particularly night sweats, can disrupt sleep and result in fatigue, which has been associated with reduced sexual desire, enjoyment and satisfaction (Addis et al., 2006; McCoy et al., 1985; Nappi & Lachowsky, 2009; Smith et al., 2017). Peri-menopausal women have been less frequently examined in research regarding the impact of menopausal symptoms on sexuality, despite evidence indicating a high prevalence of these symptoms and the potential for similar negative consequences.

Chronic illness and associated treatments can negatively impact sexual functioning in older women (Peel & Ellis, 2018), and the risk of developing such conditions increases with age (Van Dijk et al., 2015). Common conditions, such as diabetes, musculoskeletal disorders, cardiovascular disease, and mental illness, have been linked to reduced rates of orgasm, increased difficulty reaching orgasm, and changes in sensation (Alexander et al., 2017; Andersen & Elliot, 1994; Bellerose & Binik, 1993; Berlit et al., 2017; Binik & Mah, 1994; Courtois et al.,

2011; Danesh et al., 2015; Ellenberg, 1980, 1984; Mazzilli et al., 2015; Otunctemur et al., 2015; Rhodes et al., 1999; Schover & Jensen, 1988; Schreiner-Engel et al., 1987; Ussher et al., 2015). Mental health is equally critical, as anxiety and depression are consistently associated with worse sexual functioning (Avis et al., 2009; Bullard, 1988; Schover & Jensen, 1988).

In summary, women's orgasm experiences are shaped by a dynamic combination of biological, psychological, and social influences. Hormonal changes and health conditions can impact genital sensitivity and orgasm function. At the same time, psychological factors such as sexual openness, body appreciation, and positive attitudes toward sex are linked to more frequent and satisfying orgasms. The context in which orgasm is experienced also plays a key role: solitary orgasms are reported as offering greater control and physical intensity, whereas partnered orgasms may provide deeper emotional satisfaction when trust and intimacy are present. Relational dynamics, from emotional safety to coercion, significantly influence the quality and meaning of women's sexual and orgasmic experiences.

Sexuality and Menopause

Among the most significant physiological and psychosocial shifts influencing women's sexuality is the one that occurs during the menopausal transition into post-menopause, warranting focused discussion. Menopause is best understood as a biopsychosocial process, encompassing hormonal and anatomical changes alongside psychological adaptation and sociocultural meaning-making. Women progress through three primary reproductive stages across adulthood: the onset of puberty and menstruation (referred to in this dissertation as pre-menopause), peri-menopause (or menopausal transition), and post-menopause, each marked by specific physiological and hormonal changes that may shape their sexual experiences (Briggs & Kovacs, 2015; Levin, 2015b; National Institute of Ageing [NIA], 2024).

Pre-menopause begins at menarche, the onset of menstruation and ovulatory cycles, and is characterized by regular reproductive hormone activity. Estrogen and progesterone, critical for fertility, also influence a range of bodily systems and are socially imbued with meanings tied to the transition into womanhood (Briggs & Kovacs, 2015; Eveleth, 2017). Peri-menopause, which typically begins between ages 45-55, involves fluctuating levels of estrogen and progesterone due to irregularities in the hypothalamic-pituitary-ovarian axis (NIA, 2024). These hormonal changes often manifest as vasomotor symptoms, sleep disruptions, mood changes, and genitourinary complaints (Briggs & Kovacs, 2015; NIA, 2024). Post-menopause is defined as beginning 12 months after the final menstrual period. At this stage, ovarian function has ceased, and symptoms related to sustained estrogen deficiency, such as hot flashes, skin thinning, and vaginal dryness, become more prominent (Briggs & Kovacs, 2015; NIA, 2024).

Although both ageing and menopause are known to impact women's sexuality, their distinct contributions remain poorly understood. Most studies focus on chronological age, neglecting the nuanced effects of menopausal status and overlooking variables such as general health and partner-related dynamics that influence older women's sexuality (Bell et al., 2017). Cultural narratives also play a role in reinforcing this gap. Ageist assumptions often render older women invisible as sexual beings, perpetuating stereotypes of asexuality and portraying sexual desire and orgasm in ageing bodies as unnatural or undesirable (Gewirtz-Meydan et al., 2018, 2019; Heywood et al., 2019; Loos & Ivan, 2018; Schover & Jensen, 1988). Environmental and institutional factors, such as the lack of sex-positive resources in long-term care settings, further constrain older women's opportunities for sexual expression (Ahrendt et al., 2017; Doll, 2012; Lester et al., 2016; Priede & Reissing, 2024; Simpson et al., 2017).

Despite these challenges, many women remain sexually active and report sexual satisfaction into older adulthood. Large-scale studies have confirmed that sexual activity often continues into the eighth and ninth decades of life (Beckman et al., 2008; Lee et al., 2016). In the Study of Women's Health Across the Nation (SWAN), 75% of post-menopausal women reported that sex remained moderately-to-extremely important to them (Avis et al., 2009). Population trends support this persistence of desire: in Sweden, the proportion of sexually active 70-year-old women rose from 38% in 1971 to 56% in 2000 (Beckman et al., 2008). Many women endorsed the belief that sexual satisfaction is essential to relationship maintenance, and a majority disagree with the notion that older people are uninterested in sex (Nicolosi et al., 2004).

There is, however, substantial variation in how women prioritize sex in mid-to-late life. For some, shifting partnership status, a partner's health, or her bodily changes can lead to decreased engagement in sexual activity (Gott & Hinchliff, 2003). For others, particularly those in satisfying and emotionally close relationships, sex remains a meaningful source of love, self-confidence, and even improved body image (Gott & Hinchliff, 2003). Research also suggests that post-menopausal women report similar levels of body appreciation (defined as holding favourable attitudes of, and valuing and respecting the body; Linardon et al., 2022; Robbins & Reissing, 2018) as their younger counterparts, which may act as a buffer against appearance-based self-doubt and support sexual well-being (Robbins & Reissing, 2018; Swami et al., 2015; Tiggemann & McCourt, 2013). Women who emphasize health and physical functionality over aesthetic appearance may derive more stable self-worth, reinforcing positive sexual self-perceptions and facilitating orgasmic pleasure (Baker & Gringart, 2009; Deeny & Kirk-Smith, 2000; Janelli, 1986; Robbins & Reissing, 2018).

At the same time, sexual challenges remain prevalent in the post-menopausal years. Between 58% and 87% of post-menopausal women reported at least one sexual problem, with common issues including reduced vaginal lubrication, diminished desire, and pain during intercourse (Addis et al., 2006; Ambler et al., 2012; del Mar Sánchez-Fuentes et al., 2014; Nazarpour et al., 2018). Nonetheless, most women do not choose sexual abstinence (Laumann et al., 1999; Lindau et al., 2007). Sex-positive cultural shifts, increased access to hormonal and non-hormonal interventions (e.g., lubricants, moisturizers, sex therapy), and adaptive shifts in sexual expectations allow many women to continue pursuing satisfying sexual lives (Bachmann & Leiblum, 1991; Castelo-Branco et al., 2008). These adaptations often involve reimagining sexual scripts to emphasize pleasure, connection, and flexibility over performance-based goals such as penetrative intercourse (Lester et al., 2016; Priede & Reissing, 2024).

Psychological strengths such as body appreciation further support this process, acting as a protective factor against appearance-related distress and promoting resilience across age groups (Robbins & Reissing, 2018; Tiggemann & McCourt, 2013). As women age, distress associated with sexual difficulties tends to decline, perhaps due to shifting expectations, improved self-acceptance, or better coping strategies (Bancroft et al., 2003; Hayes et al., 2008; Robbins & Reissing, 2018; Shifren et al., 2008). Importantly, many women who report persistent sexual difficulties also describe feeling sexually and relationally satisfied, underscoring their capacity for adaptation and resourceful engagement with sexuality across the lifespan (Cain et al., 2003; Hartmann et al., 2004; Kingsberg, 2002; Neto & Pinto, 2015; Robbins & Reissing, 2018; Rosen et al., 2009).

These details highlight an interesting contradiction: although sexual dysfunction has been reported as common in post-menopause, many women do not find these changes distressing.

Older women report fewer sexual problems than younger women, possibly reflecting adjusted expectations and greater acceptance of physical and relational changes (Ambler et al., 2012). This suggests that sexual satisfaction can endure despite physiological shifts, particularly when women access supportive resources or reframe the meaning of sex in later life. Overall, women show notable resilience in sustaining intimacy, connection, and pleasure as they age (Robbins & Reissing, 2018; Rosen et al., 2009).

Measuring the Subjective Orgasm Experience

Despite the documented biopsychosocial changes that accompany menopause and chronological ageing, and their implications for women's sexual functioning, little is known about how these transitions may affect the SOE, a gap that is compounded by limitations in current measurement tools. The Orgasm Rating Scale (ORS) was developed by Mah and Binik (2002) to assess the SOE in women and men using 28 adjectives across two core dimensions: cognitive-affective (e.g., pleasurable satisfaction, relaxation, emotional intimacy, ecstasy) and sensory (e.g., building, flooding, flushing, shooting, and throbbing sensations, general spasms). All items were administered to both women and men, as initial validation analyses indicated that the same two-dimensional structure fit the data consistently across sexes. The ORS demonstrated strong internal consistency across both solitary and partnered contexts (Cronbach's α = .88-.92; Mah, 2000; Mah & Binik, 2002). Complementing this scale, the Bodily Sensations of Orgasm Scale (BSOS) was developed by Dubray and colleagues (2017) to assess physiological sensations associated with orgasm in women and men, capturing four domains: extragenital sensations (e.g., heart rate, moaning), genital sensations and spasms (e.g., clitoral sensitivity, contractions), nociceptive sensations (e.g., headaches, facial tingling), and sweating responses (e.g., perspiration, hot flashes). The original version included items assessing sensations

experienced by both women and men (e.g., vulvar or testicular pulsation). For this thesis, male-specific descriptions from the items were removed. The BSOS also showed strong reliability (Cronbach's $\alpha = .87$) and demonstrated convergent validity with the ORS, with authors suggesting that the two tools be used in combination for a more comprehensive evaluation of SOE (Dubray et al., 2017).

Despite their psychometric strengths, neither the ORS nor the BSOS has been empirically validated across the adult lifespan or specifically among peri- or post-menopausal women (Dubray et al., 2017; Mah & Binik, 2002). In general, most validation studies relied on broad age categories (e.g., 18-34, 35-49, 50+; Arcos-Romero & Sierra, 2019), or age ranges (e.g., 18 to 63; Mangas et al., 2022, 18 to 73; Dubray et al., 2017, or 18 to 83 years old; Cervilla et al., 2022), which obscure distinctions between pre-, peri-, and post-menopausal stages and limit insight into developmental differences in orgasm experience. This lack of age- and stage-specific validation has significant implications for understanding SOE in later life, particularly around menopause.

Recent research by a group of Spanish researchers has expanded the utility of the ORS across diverse populations, including different genders and sexual orientations (Arcos-Romero et al., 2018; Arcos-Romero & Sierra, 2022; Mangas et al., 2024), sexual contexts (partnered vs. solitary; Arcos-Romero & Sierra, 2022; Cervilla et al., 2022; 2024; Sierra et al., 2021), and clinical groups with and without orgasmic difficulties (Arcos-Romero et al., 2018; Arcos-Romero & Sierra, 2019). The researchers proposed a revised four-factor structure (affective, sensory, intimacy, and rewards) using a shortened 25-adjective version of the ORS (Arcos-Romero et al., 2018). Findings from these studies revealed that SOE scores declined with age, but it is unclear which factors contributed to this decline (Arcos-Romero & Sierra, 2019). Compared to men, women reported higher overall SOE ratings and higher sensory and affective

dimension scores in a partnered context (Arcos-Romero & Sierra, 2022). However, women with minimal orgasmic difficulties (i.e., markedly diminished to minimally diminished sexual functioning in orgasm and sexual satisfaction) scored lower across affective, sensory, and intimacy dimensions (Arcos-Romero et al., 2018). In a large sample of men and women, affective and reward-related descriptors were more prominent, and negative evaluations were reported exclusively in the solitary setting (Mangas et al., 2024). Other findings show higher SOE ratings among heterosexual participants compared to bisexual, gay, and lesbian participants (Muñoz-García et al., 2023), and strong correlations between SOE and partner-focused dyadic sexual desire, particularly in emotionally intimate relationships (Arcos-Romero et al., 2022; Sierra et al., 2021).

Additional studies using dyadic designs found no discrepancies in SOE across couple types (woman-woman, man-man, woman-man). In female same-sex couples, SOE was not significantly associated with sexual satisfaction, possibly because sexual satisfaction reflected the quality of the overall sexual relationship between the partners rather than pleasure, or of the orgasm experience itself (Byers & MacNeil, 2006; Lawrance & Byers, 1995). Satisfaction may be influenced by a much broader range of sexual practices, such as kissing and cuddling, that contribute to the overall value of the sexual relationship (Mangas et al., 2024; Pérez-Amorós et al., 2024). However, relationship satisfaction was positively associated with the rewards dimension of SOE via partner effects (Mangas et al., 2025). One important methodological caveat is that Spanish researchers interpreted ORS responses in terms of "intensity" rather than how well each adjective described the orgasm experience, an approach that limits generalizability to other cultural contexts and may conflict with the intended use of the ORS (Mah & Binik, 2002). These findings underscore the need for developmentally sensitive,

contextually nuanced tools to better assess the SOE across the lifespan, particularly in post-menopausal populations.

Summary, Knowledge Gaps, and Rationale for Dissertation

While these tools represent a major step forward, significant gaps remain in our ability to measure SOE across diverse stages of adult female development. Despite decades of research on female orgasm, most studies have focused on orgasm frequency, dysfunction, or physiological mechanisms, rather than on the SOE (Mah & Binik, 2001; Meston et al., 2004). Consequently, little is known about how orgasm is actually *experienced* by women, especially as they age. Older women frequently remain sexually active and report satisfaction with their sexual lives (Avis et al., 2009; Beckman et al., 2008; Lindau et al., 2007), yet how they subjectively experience orgasm, and whether that experience changes across adulthood, remains poorly understood. Additionally, the influence of psychosocial, relational, and nuanced physiological changes on the SOE has not been thoroughly examined, limiting the field's ability to account for the complexity of women's sexual development across the lifespan (Bell et al., 2017; van Anders & Dunn, 2009). Validated tools such as the Orgasm Rating Scale (ORS; Mah & Binik, 2002) and the Bodily Sensations of Orgasm Scale (BSOS; Dubray et al., 2017) offer promising ways to assess SOE systematically, but they have not been validated for use with post-menopausal women or applied across the adult lifespan. Additionally, given the centrality of relational factors in women's sexuality (Basson et al., 2004), and the fact that orgasm can occur with or without a partner, the context in which sex occurs (solitary versus partnered) emerges as a particularly important factor in understanding SOE in later life. To address these gaps, the present dissertation uses a multi-method approach to examine whether the SOE differs across adulthood, between solo and partnered sexual activity, with a specific focus on post-menopausal women.

Purpose

The primary aim of this dissertation is to examine whether the SOE changes for women over adulthood, with particular attention to post-menopausal women's experiences. Although orgasm has been widely studied in terms of frequency, dysfunction, and physiological correlates, relatively few studies have explored how it is subjectively experienced, that is, how orgasm feels cognitively, emotionally, bodily, and relationally, as women age (Mah & Binik, 2002; Meston et al., 2004). This dissertation responds to this gap by systematically investigating and comparing variations in SOE across three reproductive stages in women (pre-, peri-, and post-menopause) and in two sexual contexts (solitary and partnered orgasm).

This dissertation includes two studies using quantitative and qualitative methods. Study 1 focuses on validating measures of the SOE for use with women across adulthood. Consistent with prior evidence supporting multidimensional structures for the ORS and BSOS, it was expected that a similar item pattern (ORS two-dimensions, BSOS four-dimensions) would emerge. However, since the measures were evaluated across a new population, analyses were conducted exploratorily without specifically imposing a predetermined structure in the analyses. Multi-group measurement invariance (including scalar invariance) was expected between pre, peri- and post-menopausal women in both sexual contexts showing that all women understand and use the measures the same way. Study 2 applies these measures to examine differences in SOE by menopausal status and sexual context and includes qualitative reflections from post-menopausal women about how their experiences of orgasm had evolved over time. Given that post-menopause is characterized by the greatest cumulative biological and physiological changes (e.g., hormonal shifts, genitopelvic changes, vasomotor symptoms, and increased health-related concerns), it was expected that these changes would have the strongest negative impact on the

physical components of the SOE, including sensory sensations, bodily and physiological sensations, physical intensity, and effort, compared to pre- and peri-menopausal women. With respect to sexual context, solitary orgasms were expected to involve more physical sensations and physical intensity, whereas partnered orgasms were anticipated to involve more cognitive-affective sensations and psychological intensity.

Orgasm Rating Scale and Bodily Sensations of Orgasm Scale: Validation for Use with Pre-, Peri-, and Post-Menopausal Women

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Abstract

Background: Orgasm, particularly in older women, remains a poorly understood aspect of female sexual response partly because of a lack of validated self-report measures.

Aim: To evaluate the Orgasm Rating Scale (ORS) and Bodily Sensations of Orgasm Scale (BSOS) for use with pre-, peri-, and post-menopausal women and between solitary and partnered orgasm contexts.

Methods: Participants (solitary context, 252 pre, 139 peri, 190 post; partnered context, 229 pre, 136 peri, and 194 post-menopausal women, aged 18-82 years) were asked to complete an online questionnaire based on most recent solitary and partnered orgasm. Principal components analysis with Varimax rotation summarized the data into interpretable baseline models for all groups. Multi-Group Confirmatory Factor Analysis tested for multigroup measurement invariance. Adjustments to the models were made, and final model structures were presented.

Main Outcome Measures: ORS and BSOS measuring solitary and partnered orgasm.

Results: For the ORS, 10 factor solutions were preferred, explaining 81% (pre), 80% (peri), and 81% (post) of the variance for the solitary and 83% (pre), 86% (peri), and 84% (post) of the variance for the partnered context. Factors included pleasurable satisfaction, ecstasy, emotional intimacy, relaxation, building sensations, flooding sensations, flushing sensations, shooting sensations, throbbing sensations, and general spasms. For the BSOS, 3 factor solutions were preferred, explaining 55% (pre), 60% (peri), and 56% (post) of the variance for the solitary and 56% (pre), 61% (peri), and 60% (post) of the variance for the partnered context. Factors included extragenital sensations, genital sensations and spasms, and nociceptive sensations and sweating responses. Configural, metric and scalar invariance for the solitary and partnered versions of the ORS and BSOS were found, suggesting the measures were interpreted similarly by all women.

Clinical Implications: With valid measurement tools, women's varying orgasm experiences can be investigated more systematically and compared to address gaps and conflicts in the existing literature. Ultimately, these additions may assist with improved interventions for women who are unsatisfied with their orgasm experiences.

Strengths and Limitations: Strengths include gaining the ability to compare age and menopausal status groups using empirically validated measures of orgasm experience. Limitations include cross-sectional design and lack of test-retest reliability measurement.

Conclusion: The ORS and BSOS are supported for use with women across adulthood in solitary and partnered orgasm contexts.

Keywords: Female; Orgasm; Surveys and Questionnaires; Menopause; Sexual Behaviour; Sexuality

Introduction

Female orgasm, particularly in older women, remains an under-investigated and poorly understood aspect of the female sexual response (Bancroft, 2009; Jern et al., 2018; Marchand, 2021; Safron, 2016). Most research has been focused on (non)occurrence, frequency, and dysfunction, with few studies addressing more subjective psychological aspects of the experience. One obstacle in research on the multiple domains of the orgasm experience in older women is the lack of validated self-report measures. This study was designed to examine two existing measures, the Orgasm Rating Scale (ORS; Mah & Binik, 2002) and the Bodily Sensations of Orgasm Scale (BSOS; Dubray et al., 2017), for use across adulthood.

Generally, research about older women's sexuality emphasizes considerable variation in sexual functioning (Barton & Ganz, 2015; Heidari et al., 2019; Santos-Iglesias et al., 2016; Wang et al., 2015), satisfaction (Sinković & Towler, 2019), and frequency (Bell & Reissing, 2017; Fileborn et al., 2015; Monteleone et al., 2018; Træen et al., 2017). Physiological factors potentially affect these variations in experience, including the effects of ageing and menopause on orgasm. For example, sex hormones, vulvovaginal vascularization, and lubrication are believed to be involved in a satisfying sexual response, including orgasm, but are affected by menopausal status and ageing-related changes (Davison & Davis, 2011; Giovanni et al., 2019).

The ORS (Mah & Binik, 2002), which captures phenomenological psychological perceptions, sensations, and evaluative aspects of the orgasm experience, was developed to respond to the lack of comprehensive, theoretically-based measures of orgasm experience for men and women. The measure contains 28-adjectives derived from the literature about self-reported solitary/masturbation and partnered sexual behaviour and focus group members describing the subjective experience of orgasm (Bentler, 1968; Hite, 2004; Melzack, 1975;

Newcomb & Bentler, 1983; Vance & Wagner, 1976). Using a convenience sample of undergraduate men and women (solitary, aged *M* = 23, *SD* = 7.3; partnered, aged *M* = 22.2, *SD* = 5.6 years old), the authors' initial principal component analysis found a two-dimensional (e.g., sensory and cognitive-affective dimensions) model of orgasm experience (Mah & Binik, 2002). The sensory dimension referred to the perception of physiological events such as contractile sensations (e.g., throbbing). The cognitive-affective dimension referred to the subjective evaluations and emotions associated with orgasm (e.g., satisfying, relaxing; Mah & Binik, 2002). Within the two dimensions, factor analyses revealed four factors (emotional intimacy, ecstasy, pleasurable satisfaction, relaxation) within the cognitive-affective dimension and six factors (building sensations, flooding sensations, flushing sensations, shooting sensations, throbbing sensations, general spasms) within the sensory dimension. The authors mentioned in light of the exploratory nature of their study, more liberal criteria for good fit were used in the establishment of this model (e.g., at least three of the four fit index values ≥ .80 and x^2/df ratio ≤ 2.50; Hoyle, 1995; Mah & Binik, 2002; Marsh & Hocevar, 1985). This decision may have reflected the degree of conceptual overlap between the items of this measure.

Alternative models of fit for the ORS have been tested with three and four-dimensional models (Arcos-Romero et al., 2018; Arcos-Romero & Sierra, 2019; Dubray et al., 2017). Dubray and colleagues (2017) found a preference for a three-dimensional model (sensory, cognitive, affective) with a community sample of men and women (aged *M* = 34.9, *SD* = 14.9 years old). Arcos-Romero and Sierra found a preference for a four-dimensional model (affective, sensory, intimacy, rewards) in the partnered orgasm context with two Spanish clinical samples of 532 (aged *M* = 27.12, *SD* = 9.8 years old; Arcos-Romero et al., 2018) and 757 women (aged *M* = 40.38, *SD* = 14.04 years old; Arcos-Romero & Sierra, 2019).

More recently, Dubray and colleagues (2017) developed the BSOS to focus on bodily experiences of orgasm (Courtois et al., 2011). The authors differentiated the ORS as describing the phenomenological experience of orgasmic climax, while the BSOS was designed for a more detailed assessment of the evaluation of bodily responses specific to the build-up to and experience of orgasm (Dubray et al., 2017). Convergent validity has been demonstrated between the ORS and BSOS. Dubray and colleagues suggested that the convergent validity indicated that the ORS and BSOS, used in combination, provide a comprehensive evaluation of the subjective experience of orgasm (Dubray et al., 2017).

The BSOS contains 22 adjectives based on the literature and physiologic measures (e.g., systolic/diastolic blood pressure, electromyography, photoplethysmography) in men and women during, predominately masturbatory, orgasms (Bohlen et al., 1982; Courtois et al., 2008, 2011; Masters & Johnson, 1966). The initial version of the questionnaire was validated with male participants with spinal cord injuries (Courtois et al., 2011). A revised version was then validated with a non-clinical community sample of men and women (aged $M = 34.9$, $SD = 14.9$, years old), in which the context of the orgasm was not specified (Dubray et al., 2017). The initial exploratory factor analysis demonstrated a four-dimensional model including extragenital sensations (e.g., heart beating, blood pressure, muscular tension), genital sensations and spasms (e.g., genital pulsation, hypersensitive clitoris, hardening nipples, anal/abdominal contractions), nociceptive sensations (e.g., headaches, intracranial pressure, facial tingling), and sweating responses (e.g., sweating, hot flashes, reddening skin; Courtois et al., 2011; Dubray et al., 2017).

The ORS has been most specifically used to measure differences in the experience of orgasm in solitary and partnered sexual contexts and the BSOS to measure orgasm generally, without the specification of sexual context. Solitary orgasms have been described by more

sensory terms, pleasurable, localized, sharper, and physically satisfying (Fahs, 2014; Mah & Binik, 2002, 2005). Yet, other researchers reported that solitary orgasms were short-lasting, experienced on the orgasmic platform, and are frequently lacking satisfying release (Butler, 1976; Fisher, 1973; Masters & Johnson, 1966; Newcomb & Bentler, 1983; Robertiello, 1970; Singer & Singer, 1972). Similarly, more recent research has described partnered orgasms as whole-body experiences, deeper, stronger, lasting longer, and more psychologically satisfying (King et al., 2011; Mah & Binik, 2005). More dated research described partnered orgasms as building slowly, having no sharp peak, experienced more internally, and accompanied by a deep sense of release and satisfaction (Fisher, 1973; Masters & Johnson, 1966; Newcomb & Bentler, 1983; Robertiello, 1970; Singer & Singer, 1972). Although there is no consensus about how solitary and partnered orgasms differ, there is agreement that orgasm in each context is experienced differently (Arcos-Romero & Sierra, 2019; Fahs, 2014). These findings highlight the importance of having validated measures that allow researchers to compare orgasm in different contexts to fully understand the complexity of experiences and potential differences, including over the lifespan.

The present study first addresses the lack of validation of self-report measures to assess older women's orgasm experiences. To determine this, the underlying factor structure of the ORS and BSOS in solitary and partnered contexts is evaluated. Although analyses were exploratory, we expect the component structure to broadly align with prior validation studies, with the ORS reflecting two dimensions and the BSOS reflecting four dimensions. Second, we test whether pre-, peri-, and post-menopausal women understand and use the measures the same way, allowing for meaningful comparisons in future research. Specifically, we expect that multi-

group measurement invariance (including scalar invariance) would be found between pre-, peri-, and post-menopausal women in both sexual contexts.

Method

Participants

The sample consisted of 637 women ranging in age from 18 to 82 years. All participants were asked to complete measures for both solitary and partnered contexts which were counterbalanced across participants. Not all participants completed both, as some women reported having experienced only solitary or only partnered orgasms. For the solitary context, 252 pre-menopausal, 139 peri-menopausal, and 190 post-menopausal women participated. In the partnered context, 229 pre-menopausal, 136 peri-menopausal, and 194 post-menopausal women participated. In the pre-menopausal group, 23 participants provided data only for solitary orgasm and 3 only for partnered orgasm. In both the peri-menopausal and post-menopausal groups, 3 participants provided solitary-only data and 4 partnered-only data. All remaining participants contributed data to both solitary and partnered analyses. The mean ages were 27.81 years (SD = 8.34), 50.02 years (SD = 3.06), and 60.08 years (SD = 6.43) respectively. From the STRAW Staging System, a decision tree was created to provide guidelines to determine pre-, peri-, and post-menopausal status (Menopausal Status Decision Tree in Appendix; Soules et al., 2001). The decision tree was created and applied independently by two researchers; interrater reliability analysis using Kappa statistic was performed to determine consistency among raters (Landis & Koch, 1977). The interrater reliability was Kappa = 0.86, $p < .001$), 95% CI (0.781, 0.939) indicating almost perfect agreement between raters (Landis & Koch, 1977).

According to the decision tree, women between the ages of 40-60 who reported being on continuous birth control (n = 8) interrupting their monthly cycle were first assessed for physical

and psychological symptoms associated with menopause. If symptoms were endorsed, age was then considered such that if they were 58 years old or older, they were grouped into post-menopause and if they were <58 years, they were grouped into peri-menopause. If no menopausal symptoms were endorsed, and the women were 58 years old or older, they were grouped into post-menopause. If they were younger than 40 years old, they were grouped into pre-menopause, and women 40 to 57 years old were considered in peri-menopause. The age cut-offs were chosen based on North American averages for peri- and post-menopause age of onset (Costanian et al., 2018).

Nineteen women reported having had a hysterectomy or oophorectomy and were omitted from all analyses and when computing the sample sizes reported above. There has been no consensus in the literature regarding whether orgasmic capacity changes post-surgery. Some research indicated a negative impact (Bellerose & Binik, 1993; Bernhard, 1992), and others report no change (Kilkku et al., 1983; Rhodes et al., 1999; Virtanen et al., 1993) or improvements (Komisaruk et al., 2011). Some research suggests that sexual functioning after a hysterectomy might be dependent on time since surgery (Mah & Binik, 2001) and age at the time of surgery (Bıldırcın et al., 2020). As we did not have surgery dates in the current study, a decision was made to exclude these participants.

Detailed demographic data for the participants are presented in Table 1. Most were White, living in North America, were only-or-mostly attracted to men, were in a committed relationship or married, were college/university educated, ranged from not at all to somewhat religious, and ranged from average to above-average mental and physical health.

Table 1

Demographic Characteristics of the Participants

Variable	Pre-menopause	Peri-menopause	Post-menopause
Age (years, mean ± SD)	27.81 ± 8.34	50.02 ± 3.06	60.08 ± 6.43
Ethnicity, n (%)	231	97	184
Asian	25 (10.8)	5 (5.1)	2 (1.1)
Black	19 (8.2)	8 (8.1)	11 (6.0)
First Nations	2 (0.8)	4 (4.1)	3 (1.6)
Hispanic	13 (5.6)	1 (1)	4 (2.2)
Unspecified-Multiracial	6 (2.6)	3 (3.1)	2 (1.1)
White	166 (71.9)	76 (78.3)	162 (88)
Country, n (%)	220	98	183
Australia	4 (1.8)	1 (1)	-
Canada	47 (21.4)	6 (6.1)	8 (4.4)
India	10 (4.5)	2 (2)	2 (1.1)
United Kingdom	8 (3.6)	1 (1)	2 (1.1)
United States of America	151 (68.6)	88 (89.8)	171 (93.4)
Sexual attraction, n (%)	372	121	222
Only men	173 (46.5)	84 (69.4)	186 (83.8)
Mostly men	115 (30.9)	24 (19.8)	25 (11.3)
Men and women equally	48 (12.9)	5 (4.1)	5 (2.2)
Mostly women	17 (4.6)	4 (3.3)	1 (0.4)
Only women	15 (4)	3 (2.5)	4 (1.8)
None, don't know	4 (1.1)	1 (0.8)	1 (0.4)
Relationship status, n (%)	368	121	220
Single	68 (18.5)	8 (6.6)	26 (11.8)
Single, casually dating	50 (13.6)	5 (4.1)	8 (3.6)
Committed, not living together	82 (22.3)	11 (9.1)	16 (7.3)
Committed, living together	64 (17.4)	25 (20.7)	22 (10)
Married	97 (26.4)	60 (49.6)	98 (44.5)
Divorced	7 (1.9)	9 (7.4)	36 (16.4)
Widowed	-	3 (2.5)	14 (6.4)
Annual income, n (%)	232	99	186
>$25,000	59 (25.4)	17 (17.2)	35 (18.8)
$25,000-$49,999	61 (26.3)	20 (20.2)	57 (30.6)
$50,000-79,999	55 (23.7)	28 (28.3)	44 (23.6)
$80,000-119,999	38 (16.4)	21 (21.2)	35 (18.8)
>$120,000	19 (8.2)	13 (13.1)	15 (8)
Education, n (%)	235	100	186
High school	76 (32.3)	23 (23)	48 (25.8)
College/Undergraduate	106 (45.1)	50 (50)	100 (53.8)
Graduate degree	36 (15.3)	17 (17)	17 (9.1)
Postgraduate degree	17 (7.2)	10 (10)	21 (11.3)

Religiosity, n (%)	236	100	186
Not at all religious	117 (49.6)	37 (37)	63 (33.9)
A little religious	41 (17.4)	20 (20)	27 (14.5)
Somewhat religious	47 (19.9)	27 (27)	37 (19.9)
Very religious	16 (6.8)	14 (14)	44 (23.7)
Extremely religious	15 (6.3)	2 (2)	15 (8.1)
Physical health, n (%)	236	137	186
Poor	10 (4.2)	3 (2.2)	10 (5.4)
-	20 (8.5)	23 (16.8)	23 (12.4)
Average	96 (40.7)	40 (29.2)	74 (39.8)
-	70 (29.7)	51 (37.2)	55 (29.6)
Excellent	40 (16.9)	20 (14.6)	24 (12.9)
Mental health, n (%)	236	137	186
Poor	15 (6.4)	6 (4.4)	4 (2.2)
-	43 (18.2)	14 (10.2)	16 (8.6)
Average	86 (36.4)	36 (26.3)	59 (31.7)
-	53 (22.5)	44 (32.1)	44 (23.7)
Excellent	39 (16.5)	37 (27)	63 (33.9)

Measures

Orgasm Rating Scale (ORS; Mah & Binik, 2002). The ORS is a 28-item self-report measure used to assess the experience of orgasm on cognitive-affective and sensory dimensions. On a 6-point Likert scale (*does not describe it at all* (0), to *describes it perfectly* (5)) participants rate the adjectives based on how well they describe their most recent orgasm experience. Higher scores indicate stronger cognitive-affective and sensory sensations associated with orgasm. Internal consistency is considered good for women in solitary and partnered contexts, with Cronbach's alpha ranging from r = .88 - .92 (Mah, 2000; Mah & Binik, 2002). In this study, Cronbach's alpha for the total ORS scale ranged from r = .92 - .96 across menopausal status groups and sexual contexts.

Bodily Sensations of Orgasm Scale (BSOS; Dubray et al., 2017). The BSOS is a 22-item self-report measure used to assess the perceived bodily and physiological sensations experienced with orgasm, with context unspecified. Participants are asked to rate on a 5-point Likert scale (ranging from *not at all* (0), to *extremely* (4)) the degree to which they experience

each sensation during orgasm. Higher scores indicate stronger bodily and physiological sensations with orgasm. An initial validation study demonstrated moderate-high internal consistency with a Cronbach's alpha ranging from r = .65 - .87 (Dubray et al., 2017). The temporal stability of the measure was deemed acceptable (r = .74) and convergent validity was shown with the ORS, r = .54, $p < .001$ (Dubray et al., 2017). In this study, Cronbach's alpha for the total BSOS scale ranged from r = .89 - .92 across menopausal status groups and sexual contexts.

Procedure

Participants were recruited online (e.g., Facebook, Twitter, Reddit), through posters placed at various locations (e.g., gyms, rec centers, coffee shops) in a Canadian metropolitan city, and by word of mouth. Inclusion criteria were being at least 18 years of age, female, fluent in English, and having experienced an orgasm, either alone or with a partner. The study advertisements indicated that research was being conducted on women's orgasm experiences over adulthood. Participants were asked to complete an online questionnaire package on Qualtrics XM Provo, including the ORS and BSOS, based on their most recent orgasm experience for two sexual contexts: solitary/masturbation orgasm and partnered orgasm. The researchers' university ethics bureau approved the research procedures of this study.

Analytic Strategy

Principal components analysis with Varimax rotation was used to summarize the data from the ORS and BSOS into two interpretable models of subjective orgasm experience for all three menopausal status groups, separately, and by each sexual context (ORS: solitary pre-, partner pre-, solitary peri-, partner peri-, solitary post-, partner post-menopause; and BSOS: solitary pre-, partner pre-, solitary peri-, partner peri-, solitary post-, partner post-menopause).

Principal components analysis (PCA) is appropriate for exploratory and data-driven analyses, as PCA aims to explain all the variance of every variable (Flora & Flake, 2017). Items were considered for elimination based on low communalities (≤.40) and low factor loadings (<.30). Items loading similarly on more than one factor were sorted based on item/factor interpretability. Analyses were performed using IMB SPSS Statistics 27.

Using Multi-Group Confirmatory Factor Analysis (MGCFA), the factor structures determined during the PCA were used as a baseline model to investigate multi-group measurement invariance with IBM SPSS AMOS 27. Adjustments to the model were made as needed, and final model structures are suggested for mean comparisons between menopausal status groups in future research.

Results

Data Considerations

Sampling adequacy was tested based on the Kaiser-Meyer-Olkin (KMO) Measures of Sampling Adequacy for the overall data set, the KMO measures for each variable, and the diagonals of the anti-image correlations matrices. Bartlett's tests of sphericity were used to determine if the data was suitable for reduction.

ORS. First, the Kaiser-Meyer-Olkin (Kaiser, 1974) measures of sampling adequacy were above the commonly recommended value of .6 (solitary pre = .91, peri = .85, post = .87; partnered pre = .90, peri = .91, post = .90), and the diagonals of the anti-image correlation matrices were all over .5. Additionally, the Bartlett's tests of sphericity were significant (solitary pre $x^2(378) = 4603.25$, $p = .000$, peri $x^2(378) = 2322.03$, $p = .000$, post $x^2(378) = 3254.70$, $p = .000$; partnered pre $x^2(378) = 4382.94$, $p = .000$, peri $x^2(378) = 3357.36$, $p = .000$, post $x^2(378)$

= 4168.24, p = .000). Given these overall indicators, PCA was deemed suitable with all 28 items for all groups.

BSOS. The Kaiser-Meyer-Olkin measures of sampling adequacy were above .6 (solitary pre = .87, peri = .87, post = .83; partnered pre = .89, peri = .88, post = .86), and the diagonals of the anti-image correlation matrix were all over .5. The Bartlett's tests of sphericity were significant (solitary pre $x^2(210) = 2467.19$, p = .000, peri $x^2(210) = 1781.04$, p = .000, post $x^2(210) = 2088.10$, p = .000; partnered pre $x^2(210) = 2239.87$, p = .000, peri $x^2(210) = 1906.29$, p = .000, post $x^2(210) = 2486.15$, p = .000), indicating PCA is suitable with all 22 items for all groups. Although all items were deemed suitable, it is suggested that items "anal contraction" and "moaning" be removed from current analyses. These two items do not share the same face validity as the rest. In sum, PCA was deemed suitable with 20 of 22 items for all groups.

Factor Analysis

PCA with Varimax rotation was used as a preliminary extraction technique to provide an empirical data summary (Tabachnick & Fidell, 1996). Reducing the number of variables in the ORS and BSOS measures allowed for identifying and computing composite scores. Varimax rotation was chosen to maximize the variance of loadings within factors and across variables to simplify factors, keep factors orthogonal, and produce factor loadings that would replicate when items have cross-loadings. Preserving orthogonal factors improves the scientific utility and interpretability of the results in future research using mean comparisons (e.g., dependent variables in ANOVAs; Tabachnick & Fidell, 1996). Factors were interpreted through their factor loadings, whereas a minimum substantial loading of .45 indicated a 20% variance overlap between factor and item (Tabachnick & Fidell, 1996).

ORS. In the solitary context, the number of Eigenvalues greater than one, which explained the variance in the unrotated solution, was six for pre- and peri-menopausal women and seven for post-menopausal women. In the partnered context, pre-menopausal women had six, peri-menopausal had five, and post-menopausal women had seven eigenvalues greater than one. Solutions for 2-10 factors were examined for all groups.

The 10-factor solution (see Tables 2-4), which explained 81% (pre), 80% (peri), and 81% (post) of the variance for the solitary context and 83% (pre), 86% (peri), and 84% (post) of the variance for the partnered context, was preferred. This decision was based on a combination of statistical, theoretical, interpretative, and practical considerations.

One of the primary justifications for retaining the 10-factor solution was the presence of prior theoretical support for this structure. Mah and Binik (2002) originally identified a hierarchical ORS model consisting of two overarching dimensions (cognitive-affective and sensory) that further separated into 10 more fine-grained factors. Within the cognitive-affective dimension, these included emotional intimacy, ecstasy, pleasurable satisfaction, and relaxation, whereas the sensory dimension consisted of building sensations, flooding sensations, flushing sensations, shooting sensations, throbbing sensations, and general spasm sensations. Retaining the 10-factor solution therefore provided continuity with the original conceptualization of the ORS and preserved the descriptive richness of the measure.

Additional support for the 10-factor solution was derived from several empirical indicators. First, scree plots demonstrated a gradual "levelling off" of eigenvalues after the tenth factor for the majority of menopausal groups and sexual contexts (see Appendix), supporting the retention of 10 factors (Zwick & Velicer, 1986). Second, although some factors contained only two items, these items demonstrated sufficiently high factor loadings and stronger correlations

with one another than with other items, suggesting that they represented coherent and interpretable constructs (see Correlation Matrices in Appendix). Third, while the two-, three-, and four-factor solutions demonstrated relatively similar structures, later factor solutions (particularly five through nine factors) were more difficult to interpret consistently across groups and contexts. In contrast, the 10-factor model resulted in a more conceptually coherent and stable structure. Lastly, intercorrelations among the 10 ORS subscales were examined using Pearson's correlations. Subscales were considered potentially redundant if correlations exceeded .70, with correlations above .80 indicating strong redundancy (Akoglu, 2018; Cohen, 1988). Across both sexual contexts and all menopausal groups, no redundancy was observed for the ORS, suggesting that each subscale captured conceptually distinct information. The only exceptions were found in the partnered context for peri-menopausal women, where high correlations emerged between relaxation and emotional intimacy, and between shooting and flushing sensations.

Importantly, the 10-factor solution also demonstrated the strongest consistency across menopausal status groups and sexual contexts. Analyses indicated that lower-factor solutions did not adequately reproduce comparable factor structures across groups, limiting their usefulness for subsequent group comparisons. In contrast, the 10-factor structure was ultimately the only model to demonstrate acceptable measurement invariance across menopausal groups and contexts, suggesting that participants interpreted the ORS dimensions in a sufficiently similar manner to justify meaningful comparisons in subsequent analyses. Given that a central aim of the present study was to compare SOE across menopausal stages and sexual contexts, achieving this structural consistency was considered particularly important.

Finally, retaining a larger number of factors was considered advantageous from both descriptive and clinical perspectives. More differentiated components allow for a richer characterization of the SOE and provide greater interpretive utility in future mean comparisons and clinical applications (Humphreys, 1964; Mote, 1970; Zwick & Velicer, 1986). For example, distinctions between dimensions such as emotional intimacy and relaxation within the cognitive-affective domain may hold greater contextual and clinical relevance than broader higher-order categories alone.

Table 2

Principal Components Analyses for ORS After Varimax Rotation for Pre-Menopausal Women

	Factor 1		Factor 2		Factor 3		Factor 4		Factor 5		Factor 6		Factor 7		Factor 8		Factor 9		Factor 10	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Loving	.86	.11	.11	.30	.20	.08	.16	.19	.08	.81	.11	.11	.09	.05	-.03	-.08	.01	.00	.05	.14
Passionate	.81	.23	.13	.50	.20	.28	.05	.16	.14	.63	-.01	.06	.17	.05	-.05	-.04	.04	-.04	.14	-.03
Tender	.83	.27	.11	.11	.18	.00	.18	.26	.06	.73	.23	.05	.09	.15	.03	.21	.03	.09	.01	-.01
Unifying	.82	.57	.05	.16	.18	.07	.23	.20	.01	.58	.09	-.02	.06	.05	.14	.27	.11	.02	.02	.03
Ecstatic	.38	.76	.11	.18	.73	.17	.10	.14	.20	.30	.17	.15	.12	.18	.05	.09	.12	.04	.08	.05
Elated	.42	.80	.10	.13	.73	.12	.18	.19	.12	.19	.11	.15	.08	.14	.10	.12	.13	.11	.17	.03
Euphoric	.17	.77	.14	.24	.78	.26	.18	.16	.24	.05	.09	.21	.10	.02	.13	.07	.11	.16	.00	.05
Rapturous	.36	.79	.29	.08	.51	.19	.08	.12	.14	.10	.21	.09	.33	.20	.21	.05	.05	.07	-.14	.09
Pleasurable	.06	.14	.09	.83	.19	.15	.18	.14	.82	.11	.08	.03	.03	-.08	.20	.16	.12	.23	.06	.08
Satisfying	.11	.19	.08	.85	.15	.11	.25	.20	.85	.22	.08	.02	.06	.08	.07	.04	.16	.05	.04	.01
Fulfilling	.22	.16	.18	.79	.39	.19	.38	.26	.58	.24	.13	.12	-.07	.06	.00	-.03	.07	.08	-.01	-.02
Relaxing	.11	.06	.16	.33	.12	.08	.72	.82	.45	.12	.00	.09	.13	.01	.03	.04	.02	.06	.09	.01
Peaceful	.32	.26	.13	.16	.20	.09	.81	.86	.18	.22	.19	.08	.02	.07	.08	-.02	.05	.05	-.01	.04
Soothing	.26	.24	.17	.12	.13	.10	.82	.86	.20	.21	.15	.12	.05	.10	.11	-.05	.12	.03	.08	.08
Building	.05	.11	.01	.10	.02	.10	.04	-.10	.29	.21	.14	.08	-.02	-.03	.82	.83	.11	.17	.19	.14
Swelling	.00	.21	.22	.01	.26	.06	.14	.07	-.03	-.10	.19	.41	.11	.08	.76	.65	.11	.24	.06	-.04
Flooding	.05	.22	.17	.05	.24	.13	.16	.15	.11	.05	.75	.81	.21	.17	.25	.21	.00	.05	.00	.15
Flowing	.22	.17	.15	.11	.09	.05	.11	.11	.12	.12	.83	.81	.08	.29	.11	.10	.14	.07	.05	.10
Flushing	.15	.13	.21	.03	.07	.17	.07	.09	.02	-.05	.38	.34	.27	.17	.07	.40	.10	-.25	.66	.61
Spreading	.16	.18	.16	.05	.10	.15	.10	.11	.10	.12	.20	.28	.19	.29	.26	.16	.04	.12	.81	.81
Shooting	.14	.24	.16	.05	.13	.11	.05	.03	.07	.10	.14	.08	.86	.81	.10	-.04	.04	.17	.15	.17
Spurting	.25	.13	.16	-.02	.14	.18	.09	.10	-.02	.15	.32	.38	.71	.73	-.05	-.05	.21	.20	.07	.00
Throbbing	.08	.20	.22	.17	.21	.28	.05	.09	.10	.04	.14	.13	.12	.16	.10	.18	.83	.76	.14	.12
Pulsating	.09	.14	.35	.20	.07	.41	.12	.07	.28	.00	.06	.04	.10	.11	.16	.24	.72	.71	-.11	.01
Shuddering	.10	.12	.79	.08	.09	.78	.03	.08	.18	.08	.11	.02	.18	.23	.12	.20	.14	.21	.02	-.03
Trembling	.16	.23	.85	.19	.12	.84	.19	.09	.08	.08	.14	.10	.04	.04	.05	-.01	.16	.15	.13	.16
Quivering	.12	.24	.82	.19	.16	.84	.19	.09	.02	.09	.20	.12	.12	.09	.06	.01	.19	.14	.08	.03

Note. Solitary context (1); partnered context (2).

Table 3

Principal Components Analyses for ORS After Varimax Rotation for Peri-Menopausal Women

	Factor 1		Factor 2		Factor 3		Factor 4		Factor 5		Factor 6		Factor 7		Factor 8		Factor 9		Factor 10	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Loving	.83	.84	.06	.15	.11	.26	.17	.08	.20	.11	.09	.27	-.03	.03	-.02	.09	.13	.04	-.03	.04
Passionate	.73	.65	.18	.12	.11	.34	.28	.14	.11	.22	.10	.26	.05	.28	.14	.08	.12	.11	.08	.08
Tender	.76	.82	.06	.10	.07	.20	.15	.07	.13	.18	.09	.28	.02	.06	.20	.14	.24	.16	-.24	-.03
Unifying	.82	.63	.09	.10	.20	.35	.21	.16	.12	.30	.01	.12	.03	.18	.03	.16	-.07	-.09	.00	.18
Ecstatic	.48	.42	.09	.20	.22	.16	.69	.21	.05	.75	.07	.12	.06	.01	.10	.09	.01	-.01	.03	.12
Elated	.42	.34	.09	.35	.12	.23	.75	.24	.09	.65	.09	.16	.12	.08	.11	.03	.00	.06	-.04	.14
Euphoric	.14	.15	.19	.28	.14	.31	.66	.24	.17	.65	.38	.18	.07	.24	.16	.22	.17	-.03	-.01	.09
Rapturous	.51	.08	.17	.28	.21	.15	.62	.19	.03	.65	.11	.24	.14	.28	.02	.12	.02	.34	.09	.02
Pleasurable	-.10	.27	.19	.14	-.17	.83	.23	.12	.28	.15	.73	.11	.05	.12	-.12	.17	.16	.02	.06	-.02
Satisfying	.13	.26	.18	.14	-.01	.84	.15	.04	.17	.14	.86	.24	.12	.11	.03	.08	.00	.13	.04	.04
Fulfilling	.23	.26	.17	.12	.20	.82	.00	.10	.27	.20	.77	.28	.07	.12	.16	.09	-.05	.04	.07	.07
Relaxing	.11	.25	.05	.07	-.11	.45	.23	.08	.75	.14	.26	.65	.20	.20	-.09	.15	.15	.09	-.07	.17
Peaceful	.27	.33	-.09	.12	.14	.24	.02	.16	.81	.14	.22	.81	.07	.03	.03	.15	-.02	.00	.17	.03
Soothing	.15	.38	.09	.17	.14	.23	.02	.19	.86	.23	.21	.76	.13	.10	.15	.07	.03	.01	.06	.04
Building	-.12	.28	.29	.24	.01	.24	.01	.08	.14	.00	.12	.05	-.01	.82	.18	.12	.05	-.05	.86	.07
Swelling	.23	.01	.00	.17	.17	.10	.11	.20	.00	.36	.09	.17	.27	.77	.23	.13	.15	.18	.78	.00
Flooding	.07	.07	.18	.16	.45	.14	.29	.84	.13	.10	-.03	.06	-.03	.30	.63	.02	.25	.01	.02	.11
Flowing	.20	.13	.09	.16	.75	.11	.27	.83	.03	.27	.04	.19	.07	.04	.29	.01	.07	.09	-.01	.02
Flushing	.18	.03	.02	.24	.82	.07	.02	.60	-.04	.21	.03	.16	.23	-.09	-.06	.10	.16	.56	.08	.11
Spreading	.22	.24	.15	.20	.24	.19	-.02	.32	.07	.04	.16	-.05	.09	.22	.20	.13	.79	.63	.04	.35
Shooting	.15	.09	.16	.21	.47	.06	.26	.35	.13	.19	-.15	.13	.15	.06	.12	.06	.60	.19	.05	.82
Spurting	.14	.14	.20	.12	.25	-.02	.21	.28	.27	.12	.01	.05	-.11	.02	.65	.34	.17	.17	-.10	.70
Throbbing	.05	.15	.16	.36	.21	.23	.13	.18	.13	.17	.09	.18	.83	.16	.01	.71	.11	.14	.08	.10
Pulsating	.00	.25	.25	.40	-.01	.20	.09	.11	.20	.13	.12	.17	.82	.16	.20	.73	.03	.03	-.10	-.01
Shuddering	.05	.11	.86	.85	.09	.14	.08	.17	.07	.16	.08	.08	.18	.11	.03	.21	.07	.06	.05	.03
Trembling	.17	.14	.87	.86	.07	.14	.13	.14	.07	.21	.21	.10	.10	.15	.06	.18	.03	.07	.08	.09
Quivering	.19	.09	.74	.86	.13	.09	.14	.17	-.11	.22	.24	.11	.15	.16	.03	.12	.19	.13	.22	.13

Note. Solitary context (1); partnered context (2).

Table 4

Principal Components Analyses for ORS After Varimax Rotation for Post-Menopausal Women

	Factor 1		Factor 2		Factor 3		Factor 4		Factor 5		Factor 6		Factor 7		Factor 8		Factor 9		Factor 10	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Loving	.88	.10	.15	.85	.09	.27	.06	.18	.19	.04	.10	.12	-.02	-.06	.06	.12	-.04	.02	.03	.05
Passionate	.86	.31	.29	.60	.12	.38	.03	.09	.07	.07	.06	.27	-.02	.24	.12	.13	.05	.11	.02	-.14
Tender	.84	.14	.14	.83	-.04	.11	.05	.30	.26	.18	.07	.14	.12	-.01	.04	.08	-.02	-.02	-.09	.03
Unifying	.83	.32	.29	.73	.06	.18	.03	.28	.03	.09	.07	.15	.08	.02	.08	-.07	-.05	.10	.14	.15
Ecstatic	.38	.80	.73	.25	.17	.17	.14	.19	.09	.25	.08	.22	.06	.11	.15	.10	.04	.06	.02	.00
Elated	.38	.78	.75	.22	.10	.19	.16	.23	.15	.25	.09	.24	.13	.07	.09	.05	.04	.05	.09	.03
Euphoric	.15	.80	.77	.08	.21	.32	.18	.12	.09	.12	.09	.15	.16	.25	.11	.05	.12	.11	.13	.07
Rapturous	.31	.80	.68	.20	.15	.16	.15	.07	.11	.16	.17	.13	.13	.13	.22	.22	.04	.05	-.02	.13
Pleasurable	.02	.24	.08	.21	.88	.75	.15	.18	.17	.14	.05	.10	.14	.16	.04	.04	.07	.21	.04	-.02
Satisfying	.04	.21	.14	.21	.89	.85	.14	.22	.14	.16	.06	.07	.09	.06	.04	.05	.04	.08	-.01	.05
Fulfilling	.18	.25	.33	.27	.73	.77	.12	.26	.18	.17	.04	.04	.11	.08	-.03	.08	.00	-.04	.04	.12
Relaxing	.15	.09	-.04	.15	.39	.40	-.03	.76	.74	.06	-.02	.11	.08	.12	.10	-.02	.12	.12	.08	-.04
Peaceful	.24	.20	.13	.30	.14	.15	.09	.84	.87	.10	.09	.09	.06	.07	.07	.12	-.03	.08	.02	.07
Soothing	.13	.20	.23	.34	.10	.17	.12	.81	.87	.11	.13	.12	.02	.13	.08	.14	-.01	.07	.03	.07
Building	-.09	.07	.10	.01	.11	.29	.08	.17	.01	.17	.09	.09	.01	.05	.04	.01	.90	.80	.17	.31
Swelling	.10	.17	.16	.13	-.03	.09	.16	.07	.07	.19	.43	.27	.44	.29	.00	.06	.55	.25	-.13	.75
Flooding	.02	.17	.26	.09	.05	.12	.12	.08	.04	.15	.78	.75	.19	.10	.20	.29	.15	.04	-.04	.19
Flowing	.17	.18	.13	.19	.10	.16	.05	.12	.05	.03	.85	.83	.04	.09	.02	.14	.00	.06	.10	-.02
Flushing	.09	.27	-.10	.22	-.02	-.11	.28	.10	.15	.28	.25	.21	-.02	.06	.28	.11	.10	.13	.68	.62
Spreading	.08	.24	.17	.21	.06	-.08	.23	.16	.11	.17	.23	.45	.25	.33	.11	.05	.18	.55	.78	-.15
Shooting	.04	.12	.34	.06	.02	.11	.12	.10	.13	.20	.12	.30	.09	.13	.79	.75	.15	.25	.13	-.14
Spurting	.28	.17	.12	.11	.05	.03	.06	.09	.10	.14	.26	.19	.13	.08	.80	.82	-.09	-.14	-.01	.15
Throbbing	.03	.19	.20	.02	.16	.09	.20	.09	.12	.35	.04	.13	.80	.80	.18	.13	.09	.10	.17	.06
Pulsating	.08	.21	.12	-.02	.21	.18	.27	.17	.01	.23	.14	.11	.82	.82	.04	.08	.00	.05	.09	.20
Shuddering	.04	.26	.11	.18	.10	.06	.69	-.02	.06	.76	.09	.07	.26	.18	.08	.10	.10	.22	.29	.08
Trembling	.07	.15	.19	.06	.16	.18	.87	.15	.06	.84	.12	.14	.14	.20	.04	.11	.03	.02	.04	.00
Quivering	.05	.21	.18	.08	.15	.22	.86	.14	.07	.72	.15	.15	.13	.22	.08	.18	.06	.05	-.03	.15

Note. Solitary context (1); partnered context (2).

The factor labels, initially proposed by Mah and Binik (2002), suited the extracted factors and were retained (Final Factor Structures with Items in Appendix). For all women within the solitary context, the highest percentage of variance explained for the rotation sums of squared loadings was emotional intimacy (pre 14%, peri 13%, post 13%). In the partnered context, ecstasy accounted for the highest percentage of variance for pre- (13%) and post-menopausal women (13%) and emotional intimacy accounted for the highest percentage for peri-menopausal women (12%).

Overall scale and factors' internal consistencies were examined using Cronbach's alpha (Internal Consistency Tables in Appendix; Ursachi et al., 2015). Most total score and factors' internal consistencies ranged from acceptable to very good for all menopausal status groups and sexual contexts: Total scale $\alpha = .92 - .96$, emotional intimacy $\alpha = .85 - .91$, ecstasy $\alpha = .88 - .94$, pleasurable satisfaction $\alpha = .83 - .93$, relaxation $\alpha = .86 - .92$, building sensations $\alpha = .41 - .79$, flooding sensations $\alpha = .77 - .85$, flushing sensations $\alpha = .54 - .70$, shooting sensations $\alpha = .70 - .77$, throbbing sensations $\alpha = .74 - .87$, and general spasms $\alpha = .85 - .95$.

The 10-factor solution produces reasonably acceptable results, however there were two factors with poor internal consistency found in the solitary context for peri- and post-menopausal women: Building sensations (peri $\alpha = .41$; post $\alpha = .56$) and flushing sensations (peri $\alpha = .54$; post $\alpha = .54$). It is common to find low Cronbach values (e.g., .50) with ≤ 5 item scales (Hinton et al., 2004). These factors, with lower alphas, could be combined in future work to increase their reliability (e.g., flooding sensations and flushing sensations could be combined, and shooting sensations and throbbing sensations could be combined). Within factors, three items ("fulfilling," "relaxing," "shuddering") were identified across multiple groups to improve their factor's alpha if eliminated. Nevertheless, all items were retained because each scale and factors already had

good internal consistency, and all items demonstrated high communalities during PCA. For all groups and sexual contexts, the item *close* was eliminated at this stage because it did not contribute to a simple factor structure (e.g., single-item loading on a factor).

Composite scores were created for each of the 10 factors, and the total scale score based on the item means (Descriptive Statistics in Appendix). Average, instead of summed scores, were computed to retain the scale metric. Average composite scores will allow for more straightforward interpretation and help comparisons across factors since each did not have the same number of items (DiStefano et al., 2009). Higher scores indicated greater perceptions of the sensation during orgasm. All three groups of women reported the highest perceptions of pleasurable satisfaction during solitary and partnered orgasms, with a negatively skewed distribution. Emotional intimacy (solitary) and shooting sensations (solitary/partnered) were perceived the least by all women. Most scale and factors had skewness and kurtosis within a tolerable range for assuming a normal distribution. Standard deviations of the components scores were calculated to determine any significant outliers, and none were found.

BSOS. In the solitary context, the number of Eigenvalues greater than one, which explained the variance in the unrotated solution, was four for pre- and peri-menopausal women and five for post-menopausal women. There were four eigenvalues greater than one for all three groups of women in the partnered context. Solutions for 1-6 factors were examined for each menopausal status group and sexual context and the decision was based on statistical, theoretical, and interpretive considerations.

First, the three-factor solution (see Table 5), which explained 55% (pre), 60% (peri), and 56% (post) of the variance for the solitary context and 56% (pre), 61% (peri), and 60% (post) of the variance for the partnered context, was preferred because the scree plots demonstrated a clear

"levelling off" of eigenvalues after the third or fourth factor across menopausal groups and sexual contexts (see Appendix), supporting the retention of a more parsimonious three-factor structure. Second, the 3-factor solution was theoretically consistent with prior conceptualizations of the BSOS. Specifically, the solution aligned with previous work suggesting that nociceptive sensations and sweating responses may be meaningfully combined into a broader bodily sensations factor, rather than functioning as fully distinct dimensions (Courtois et al., 2011; Dubray et al., 2017). Third, examination of the rotated component matrices demonstrated that items loaded more cleanly onto three factors, with fewer problematic cross-loadings than the four-factor solution. In contrast, alternative structures involving one, two, five, or six factors were more difficult to interpret conceptually and did not produce factors that were consistently meaningful across groups and contexts. Lastly, intercorrelations among the 3 BSOS subscales indicated no redundancy for either sexual context or for all three menopausal status groups. This finding suggests that each subscale captured conceptually distinct information.

Additionally, consistency across menopausal status groups and sexual contexts was considered particularly important given the study's aim of comparing subjective orgasm experiences across groups. The 3-factor solution demonstrated greater structural consistency across groups and contexts than competing solutions, supporting its suitability for subsequent comparative analyses.

For most groups and sexual contexts, BSOS items contributed to a relatively simple factor structure and met minimum criteria for communalities. However, the item *abdominal contraction* demonstrated a communality of .27 for post-menopausal women in the solitary context and consistently lower communalities across the remaining groups and contexts. Given its weaker contribution to the overall structure, this item was removed from further analyses.

Table 5

Principal Components Analyses for BSOS After Varimax Rotation by Menopausal Status

	Pre-menopausal						Peri-menopausal						Post-menopausal					
	Factor 1		Factor 2		Factor 3		Factor 1		Factor 2		Factor 3		Factor 1		Factor 2		Factor 3	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Increased heart rate	-.01	.05	.81	.82	.24	.19	.07	.75	.87	.32	.16	.04	.20	.23	.84	.21	.16	.84
Heart beating stronger	.07	.03	.82	.75	.21	.22	.12	.77	.86	.35	.19	.05	.23	.27	.84	.25	.19	.82
Faster breathing	.15	.01	.77	.74	.12	.27	.22	.80	.71	.27	.26	.09	.00	.10	.81	.31	.31	.79
Overall muscle tension	.20	.16	.59	.56	.25	.22	.15	.67	.64	.24	.24	.11	.11	.22	.65	.49	.34	.52
Choppy/ shallow breathing	.41	.26	.58	.64	.11	.12	.27	.61	.68	.22	.23	.36	.23	.27	.62	.35	.26	.54
Increased blood pressure	.34	.33	.57	.72	.24	.06	.38	.56	.66	.25	.17	.44	.35	.31	.61	.25	.22	.62
Hardening nipples	.19	.05	.14	.41	.56	.47	.23	.37	.27	.64	.57	.10	.02	.04	.20	.52	.56	.40
Vulvar pulsation	.19	.19	.25	.31	.64	.67	.13	.37	.33	.70	.65	.17	.05	.06	.29	.76	.73	.27
Shivers/ goosebumps	.47	.29	.19	.41	.53	.45	.38	.35	.32	.67	.59	.28	.16	.20	.25	.66	.63	.22
Hypersensitive clitoris	.04	-.02	.18	.16	.78	.73	.04	.14	.08	.76	.80	.10	.04	.04	.16	.79	.71	.21
Clitoral pulsation	.02	-.02	.16	.07	.83	.85	.06	.14	.13	.85	.87	.12	.04	.11	.11	.85	.83	.17
Lower limb spasms	.45	.36	.28	.27	.49	.55	.26	.24	.32	.61	.51	.26	.27	.28	.20	.63	.55	.18
Intracranial pressure	.71	.80	.09	.10	.22	.12	.57	-.10	.24	.38	.19	.72	.73	.80	.20	.12	.09	.17
Tightness in chest	.79	.84	.10	.06	.16	.03	.63	.13	.40	.21	.03	.78	.85	.86	.15	.10	.04	.16
Cranial pulsation/ headache	.75	.78	-.03	.03	.14	.05	.77	-.03	.21	.24	.01	.77	.79	.86	.09	.09	.13	.12
Facial tingling	.73	.73	.06	.11	.15	.08	.64	.38	.13	.17	.22	.67	.61	.67	-.10	.07	.28	.22
Reddening of skin or rash	.63	.55	.23	.33	.08	-.08	.73	.25	.11	.08	.13	.72	.53	.62	.26	.05	.15	.23
Sweating	.53	.47	.27	.43	.10	.24	.75	.51	.09	.02	.12	.34	.63	.46	.27	.28	-.03	.27
Hot flashes	.65	.71	.28	.18	-.02	.18	.78	.32	.09	-.07	.17	.61	.73	.68	.14	.18	-.02	.05

Note. Sample sizes for pre (238; 216), peri (139;137), and post-menopausal (187;192) women in the solitary (1) and partnered (2) contexts, respectively.

The factor labels proposed by Dubray and colleagues (2017) suited the extracted factors and were retained (Final Factor Structures with Items in Appendix). The three-factor labels include extragenital sensations, genital sensations and spasms, and nociceptive sensations and sweating responses. For all women within the solitary context, the highest percentage of variance explained for the rotation sums of squared loadings was nociceptive sensations and sweating responses (pre 21%, peri 20%, post 19%). For peri-menopausal women (20%) in the partnered context, extragenital sensations accounted for the highest percentage of variance explained for the rotation sums of squared loadings and nociceptive sensations and sweating responses accounted for the highest percentage of variance for pre (20%) and post-menopausal (21%) women.

The overall scale and factors' internal consistency (Appendix) was very good for all menopausal status groups and sexual contexts: Total scale $\alpha = .89 - .92$, extragenital sensations $\alpha = .84 - .89$, genital sensations and spasms $\alpha = .79 - .87$, and nociceptive sensations and sweating responses $\alpha = .83 - .86$. Within factors, the item "sweating" was identified to improve the nociceptive sensations and sweating responses factor's alpha if eliminated in the partnered context for peri and post-menopausal women. The item "sweating" was not removed as the factor's alpha already had good internal consistency for all groups.

Composite scores (Appendix) were created for each of the three factors, and total scale score, based on item means (DiStefano et al., 2009). Higher scores indicated stronger perceptions of bodily and physiological sensations with orgasm. All women reported the highest scores in extragenital sensations and genital sensations and spasms in both contexts. Nociceptive sensations and sweating responses were described less by all women in both sexual contexts, and their distributions were positively skewed and leptokurtic. The total scale score was positively

skewed for peri-menopausal women (solitary). Standard deviations of the components scores were calculated to determine any significant outliers, and none were found.

Convergent Validity

Convergent validity analyses (see Convergent Validity Tables in Appendix) were conducted to examine the degree to which the ORS and BSOS were conceptually similar to one another, given that both measures aim to assess dimensions of the SOE. Pearson correlations were computed between ORS and BSOS total scale and subscales within both solitary and partnered sexual contexts. Correlation strength was interpreted using conventional guidelines proposed by Cohen (1988), in which correlations of $r < .3$ were considered insufficient, $r > .3$ and $< .5$ were considered weak, and $r \geq .50$ are considered adequate and demonstrating convergent validity (Zhu et al., 2025).

Overall, several significant correlations emerged between total scales and subscales of the ORS and BSOS, suggesting some degree of conceptual overlap between the measures. However, the strength and consistency of these relationships differed considerably by sexual context.

In the solitary context, the majority of correlations between ORS and BSOS subscales were weak or insufficient, particularly among peri-menopausal participants. As such, evidence for convergent validity between the two measures in solitary orgasm was limited. These findings suggest that, although the ORS and BSOS are related in that they both assess aspects of orgasm, they may capture distinct dimensions of the solitary orgasm experience. Conceptually, this distinction is plausible given that the ORS primarily measures phenomenological qualities associated with orgasm (e.g., sensory and cognitive-affective sensations), whereas the BSOS focuses more specifically on the more specific genital and extragenital sensations with orgasm.

The lack of stronger convergence in the solitary context may therefore reflect the more individualized nature of solitary orgasm experiences.

In contrast, a different pattern emerged in the partnered context. Here, the majority of correlations between the ORS and BSOS were weak to adequate in magnitude, providing stronger evidence for convergent validity between the scales when assessing partnered orgasm experiences. These findings suggest that, in partnered sexual contexts, the cognitive-affective, sensory, and bodily and physiological sensations of orgasm may become more closely integrated, resulting in greater overlap between what the two measures assess. This interpretation is consistent with broader findings from the present thesis, suggesting that the presence of a partner may fundamentally alter the nature of the orgasm experience.

In summary, these findings indicate that convergent validity between the ORS and BSOS appears to be context-dependent. The scales demonstrated stronger convergence in partnered orgasm contexts than in solitary contexts, suggesting that the relationship between specific bodily sensations and subjective orgasm phenomenology may vary according to interpersonal and relational factors.

Multi-Group Confirmatory Factor Analysis (MGCFA): Measurement Invariance

Configural Invariance. Configural invariance (see Tables 6-7) testing examined whether the overall factor structure specified by the measures fit well for all menopausal status groups in each sexual context (Lee, 2018; Putnick & Bornstein, 2016).

ORS. The model fit was adequate for the solitary (A1) and partnered (B1) contexts. The basic organization of the constructs (e.g., number of loadings on each factor) was supported across pre-, peri-, and post-menopausal groups, within each sexual context (MGCCA Models in Appendix).

BSOS. The model fit was poor for solitary (C1) and partnered (D1) contexts (Appendix). The items of this scale do not fit neatly into factors, nor are they intended to. The measure simply consists of items that are relevant to orgasm. Thus, it is no surprise that the CFA fit is inadequate. As an illustration, after reviewing the largest modification indices, six cross-loadings (e.g., nociceptive sensations and sweating responses to 1) faster breathing, 2) overall muscle tension, 3) choppy/shallow breathing, 4) increased blood pressure, 5) hypersensitive clitoris, and 6) clitoral pulsation) were added between the latent factor and items to improve the solitary model (C1a) to adequate fit (e.g., CFI and TLI $\geq .9$). To improve the partnered model (D1a) to adequate fit, it also took six cross-loadings (e.g., extragenital sensations to 1) sweating, genital sensations and spasms to 2) overall muscle tension, and 3) sweating, and nociceptive sensations and sweating responses to 4) choppy/shallow breathing, 5) increased blood pressure, and 6) lower limbs spasms).

Typically, it would not be ideal to permit so many additional cross-loadings. However, we intended to test measurement invariance and thus aimed to begin with a model that reached adequate fit. Therefore, invariance was determined at the configural level for both scales and each sexual context. All the observed variables loaded on the specified latent factor and to a not too dissimilar degree between groups. This result suggests that pre-, peri-, and post-menopausal women associate the same subsets of items with the same constructs in both scales.

Table 6

Tests of Measurement Invariance with the ORS and Menopausal Status

Model	$x^2(df)$	CMIN/*df*	CFI/TLI	RMSEA (90% CI)	SRMR	Model comp	Δx^2 (Δdf)	ΔCFI	Decision
Solitary									
A1: Configural Invariance	1445.20 (837)	1.73	.936/.919	.035 (.032-.039)	.05	--	--	--	Adequate fit
A2: Metric Invariance	1498.43 (891)	1.68	.936/.924	.034 (.031-.037)	.06	A1	52.23 (54)	.000	Accept
A3: Scalar Invariance	1537.26 (945)	1.63	.937/.930	.033 (.030-.036)	.06	A2	38.83 (54)	.001	Accept
Partnered									
B1: Configural Invariance	1686.45 (837)	2.01	.925/.906	.043 (.040-.046)	.05	--	--	--	Adequate fit
B2: Metric Invariance	1745.98 (891)	1.96	.925/.911	.042 (.039-.044)	.06	B1	59.53 (54)	.000	Accept
B3: Scalar Invariance	1860.74 (945)	1.97	.919/.910	.042 (.039-.045)	.06	B2	114.76 (54)*	.006	Accept

Note. *$p \leq .01$. Solitary $N = 581$; pre-menopausal $n = 252$; peri-menopausal $n = 139$; post-menopausal $n = 190$. Partnered $N = 559$; pre-menopausal $n = 229$; peri-menopausal $n = 136$; post-menopausal $n = 194$.

Table 7

Tests of Measurement Invariance with the BSOS and Menopausal Status

Model	$x^2(df)$	CMIN/*df*	CFI/TLI	RMSEA (90% CI)	SRMR	Model comp	Δx^2 (Δdf)	ΔCFI	Decision
Solitary									
C1: Configural Invariance	1356.78 (447)	3.03	.823/.797	.059 (.056-.063)	.09	--	--	--	Poor fit
C1a: Configural Invariance	817.79 (414)	1.97	.921/.903	.041 (.037-.04)	.06	--	--	--	Adequate fit
C2: Metric Invariance	946.22 (461)	2.05	.906/.895	.043 (.039-.047)	.12	C1a	128.43 (47)*	.015	Reject
C2a: Partial Metric Invariance	895.06 (447)	2.00	.913/.900	.042 (.038-.046)	.11	C1a	77.27 (33)*	.008	Accept
C3: Scalar Invariance	976.29 (485)	2.01	.904/.899	.042 (.038-.046)	.12	C2a	81.23 (11)*	.009	Accept
Partnered									
D1: Configural Invariance	1352.74 (447)	3.03	.833/.808	.060 (.057-.064)	.09	--	--	--	Poor fit
D1a: Configural Invariance	766.85 (417)	1.84	.935/.920	.039 (.035-.043)	.06	--	--	--	Adequate fit
D2: Metric Invariance	846.21 (467)	1.81	.930/.923	.038 (.034-.042)	.07	D1a	79.37 (50)*	.005	Accept
D3: Scalar Invariance	952.96 (505)	1.89	.921/.916	.040 (.036-.044)	.07	D2	186.11 (88)*	.009	Accept

Note. *$p \leq .01$. Solitary $N = 564$; pre-menopausal $n = 238$; peri-menopausal $n = 139$; post-menopausal $n = 187$. Partnered $N = 545$; pre-menopausal $n = 216$; peri-menopausal $n = 137$; post-menopausal $n = 192$

Metric Invariance. Metric invariance testing determined whether each scale item contributed to the latent construct to a similar degree across menopausal status groups (Putnick & Bornstein, 2016). To determine fit, the constrained models (ORS A2, B2; BSOS C2, D2) were compared to the configural invariance models (ORS A1, B1; BSOS C1a, D1a).

ORS. Using a table of critical values for Δx^2 tests, the changes in model fits were non-significant, and the ΔCFI for both sexual contexts were under the cut-off of ≤ .01 (Bentler, 1990; Cheung & Rensvold, 2002). The ORS in both sexual contexts demonstrated metric invariance.

BSOS. For the solitary context, Δx^2 test was significant, and ΔCFI was >.01, demonstrating metric non-invariance. The source of non-invariance was investigated by sequentially releasing factor loading constraints based on the highest modification indices until a partially invariant model (C2a) was achieved (Putnick & Bornstein, 2016; Yoon & Kim, 2014). In the partially invariant model (C2a), the majority of items were invariant (Steenkamp & Baumgartner, 1998; Vandenberg & Lance, 2000) except for one item (e.g., "vulvar pulsation") on the genital sensations and spasms factor and three items (e.g., "overall muscle tension," "hypersensitive clitoris," "faster breathing") on the nociceptive sensations and sweating responses factor, which was non-invariant. Post-menopausal women (.93) had the steepest, and pre-menopausal (.78) the shallowest, slope of relationship between "vulvar pulsation" and the genital sensations and spasms factor. Pre-menopausal women (.16) had the steepest, and peri-menopausal (.09) the shallowest slopes with the nociceptive sensations and sweating responses factor and item "overall muscle tension." Pre-menopausal women (-.80) had the steepest, and post-menopausal (.08) the shallowest slope for the nociceptive sensations and sweating responses factor with the item "hypersensitive clitoris." Lastly, post-menopausal women (-.32) had the steepest, and pre-menopausal (.06) had the shallowest slope for the nociceptive sensations and

sweating responses factor with the item "faster breathing." In conclusion, "vulvar pulsation" and "faster breathing" made a bigger contribution to the genital sensations and spasms and nociceptive sensations and sweating responses factors in post-menopausal women. Additionally, "overall muscle tension" and "hypersensitive clitoris" made a bigger contribution to the nociceptive sensations and sweating responses factor in pre-menopausal women.

For the partnered context, Δx^2 test was significant, but ΔCFI was ≤.01, demonstrating metric invariance. All Δx^2 results are taken with caution as this statistic is highly sensitive with large sample sizes, which may provide a nonpractical test of model fit (Bentler & Bonett, 1980; Bollen, 1989; Cheung & Rensvold, 2002). In this circumstance, as Δx^2 was significant, ΔCFI was given priority in making decisions (Bentler, 1990; Cheung & Rensvold, 2002).

Scalar Invariance. Scalar invariance was tested by constraining the item intercepts to be equivalent across all groups of women (Putnick & Bornstein, 2016). The constrained item intercepts models (ORS A3, B3; BSOS C3, D3) were compared to the metric invariance and partial metric invariance models (ORS A2, B2; BSOS C2a, D2) to determine fit. For the BSOS solitary model (C2a), the slopes for the four non-invariant items were allowed to vary.

ORS. In the solitary context (A3), Δx^2 test was non-significant, and ΔCFI was ≤ .01. In the partnered context (B3), Δx^2 test was significant, but ΔCFI was ≤ .01. These results demonstrated scalar invariance.

BSOS. In the solitary and partnered contexts (C3; D3), Δx^2 tests were significant, but ΔCFI was ≤ .01, demonstrating scalar invariance. Constraining the item intercepts across groups did not significantly affect the model fits. Scalar invariance was supported and showed that the measurement scales have the same operational definitions across groups (Cheung & Rensvold, 2002).

Discussion

The ORS and BSOS were developed as researcher-administered instruments to meet the need for a validated self-report measure of the subjective experience of orgasm. The measures quantify the assessment of cognitive-affective, sensory, and physiological sensations perceived during orgasm. This study aimed at examining the measures for use with women across the adult lifespan. Based on similar factor structure across groups and measurement invariance, both measures were found to be appropriate for the evaluation of cognitive-affective, sensory, extragenital, genital, and nociceptive experiences associated with orgasm in solitary and partnered contexts for pre-, peri-, and post-menopausal women.

Overall, factor analyses indicated that 10 distinct factors were underlying women's responses to the ORS items and that these factors had good internal consistency. There were two exceptions; building sensations and flooding sensations showed poor internal consistency for peri- and post-menopausal women in the solitary context. Further replication is needed to confirm this finding and to adjust the measure if applicable. One of the 28 items (“close”) was eliminated, but otherwise, the original factor structure proposed by Mah and Binik (2002), was retained. There may have been differences in how the women interpreted the item “close” (e.g., close/proximity to orgasm, feeling emotionally close/connected to partner). More research is necessary to redefine this item or consider its permanent removal from the ORS.

Factor analyses with the BSOS measure indicated that three distinct factors were underlying women's responses to the BSOS items and that these factors had good internal consistency. The original factor structure proposed by Dubray and colleagues (2017) was retained with the combination of the last two factors (e.g., nociceptive sensations and sweating responses). Conceptually it is understandable how nociceptive sensations and sweating response

factors may be merged as both capture concepts of uncomfortable physiological experiences (e.g., tightness in the chest, hot flashes). Three (e.g., “abdominal contraction,” “moaning,” “anal contraction,”) of the 22 items were eliminated. It is unclear why the item “abdominal contraction” had lower communalities across groups. More research is necessary to redefine the item or consider its permanent removal from the BSOS.

We recommend that the item "moaning" be removed from the measure permanently. All other items appear to relate to involuntary responses occurring throughout the orgasm experience. Brewer and Hendrie showed a disconnection between the timing of women experiencing orgasm and copulatory vocalizations (e.g., moaning; Brewer & Hendrie, 2011). They suggested that there may be at least a part of these responses under women's conscious control. “Anal contractions” did not demonstrate good factorability. However, from a gender-inclusive angle, it is not recommended that “anal contraction” be removed permanently from the BSOS. Sensing anal contractions during orgasm is perhaps more common with people assigned male at birth or trans women when the anus/rectum are not being directly stimulated (Allen et al., 2020; LeBreton et al., 2017). Study participants consisted solely of cis-gendered women who may be less likely to experience this sensation subjectively during orgasm. Also, none of the participants indicated having their most recent orgasm by anal stimulation or penetration.

Descriptive analyses revealed that pleasurable satisfaction was most important to the appraisal of orgasm in the solo and partnered contexts. Emotional intimacy in the solo context and shooting sensations in both contexts were least representative of the women’s experiences. The adjectives relating to emotional intimacy may be less relevant within the solitary context as they pertain to experiences more likely felt with a sexual/romantic partner. However, some women still reported experiencing emotional intimacy during solitary orgasm; this may be

interpreted as accessing a more profound experience of one's own body and sexual preferences or feeling a sense of *transformative embodiment* (e.g., feeling wholly present in their bodies; Fahs, 2014).

Multi-group measurement invariance testing was employed to determine whether the same underlying constructs were measured across menopausal status groups. Results indicated configural, metric (e.g., except for partial metric invariance for solitary BSOS), and scalar invariance for the solitary and partnered versions of the ORS and BSOS. These findings suggest that regardless of menopausal status, women interpret the items on the ORS and the BSOS in the same manner. This allows researchers to aggregate data across generations and compare women in different age groups or menopausal status. Measurement invariance was satisfied as an essential prerequisite for future research investigating mean comparisons between menopausal status groups (Fischer & Karl, 2019; Putnick & Bornstein, 2016).

No differences were found overall in the underlying factor structure of the ORS or BSOS between the solitary and partnered contexts. Therefore, these measures can be used to compare situationally different orgasm. Thus far, few studies compared orgasm across contexts systematically; in qualitative research (Fahs, 2014) and case reports (Masters & Johnson, 1966), the experience of solitary orgasms has been described as more physiologically intense and pleasurable than orgasms experienced with a partner (Fahs, 2014; Masters & Johnson, 1966). Mah and Binik (2002) added to this by describing solitary orgasms as more localized, sharper, and more physically satisfying. Researchers have described partnered orgasms as *whole-body* experiences, deeper, stronger, lasting longer, and more psychologically satisfying than solitary orgasms (King et al., 2011; Mah & Binik, 2005).

Researchers have speculated that the differences in orgasm experiences between the two contexts primarily stem from cognitive-affective elements. Levin (1981) theorized that cognitive-affective experiences in solitary orgasms might be qualitatively different than partnered orgasms due to distinctive qualities unique to each context (Mah & Binik, 2002). In particular, it appears that emotional dimensions relevant to the relational context may result in qualitatively different experiences (Mah & Binik, 2001, 2002).

With the suggested modifications, both the ORS and BSOS are valid measures to study female orgasm across adulthood, address inconsistencies in the literature, investigate in a more systematic fashion the subjective experiences of women, and how they may differ depending on age or menopausal status. However, some limitations must be taken into consideration. Approximation was unavoidable when assigning participants on continuous birth control into menopausal status groups. Several women within the typical age range for pre- and peri-menopause reported using birth control. Depending on the type, birth control can impact the frequency of menstrual cycles (e.g., IUDs) or orgasm function (e.g., oral contraceptives). The STRAW Staging System uses menstrual cycle frequency to help inform categorization. Also, self-report data on personal and private topics like sexuality are subject to social desirability, impression management, and distortions related to retrospective reporting, memory, and self-deceptive enhancement (Cheung & Rensvold, 2002). Also, certain limitations must be noted regarding the statistical analyses. The total sample was less than the recommended sample size for principal components analysis (i.e., the basic rule of ten participants per free parameter, assuming normally distributed data), although still within acceptable limits (Bentler & Chou, 1987). The ORS and BSOS demonstrated a gradual levelling off of the scree plot during factor analysis, indicating a statistical reflection of the scale not having clearly distinct factors.

Deciding on the number of factors to extrapolate from the scree plots also introduced researchers' subjective judgments. Some factors could be strengthened by revising items with lower primary loadings and possibly adding new ones. In particular, items of the ORS do not capture negative cognitive-affective or sensory experiences. Although orgasm is typically equated with pleasure, it can also be a negative experience. The addition of negative evaluative adjectives (e.g., dull, dissatisfying, painful) may strengthen the measure's utility for all types of orgasms. Finally, within MGCFA, cross-loadings were added to the solitary and partnered versions of the BSOS model to achieve an adequate fit of the data; post-hoc changes to the model, therefore, was an exploratory "data-driven" strategy rather than a "theory-driven" strategy (Putnick & Bornstein, 2016).

Conclusion

The results of this study support the use of the ORS and the BSOS in studies with female participants across adulthood and validate their use with older women. In addition, orgasm can be compared across solitary and partnered sexual experiences. With valid measurement options, it is anticipated that we will learn more about women's orgasm experiences and ultimately be able to provide more effective clinical services for women who experience difficulties with orgasm or find the experience lacking in satisfaction.

Transition to Study 2

Study 1 focused on establishing the psychometric utility of the ORS and BSOS for use with women across menopausal stages and sexual contexts. By confirming that the ORS and BSOS functioned similarly across menopausal groups and contexts, Study 1 provided a necessary methodological prerequisite for examining possible differences in the SOE for women across adulthood. In doing so, it addressed a critical gap in the literature: the absence of validated measures appropriate for use with older women.

Building on this groundwork, Study 2 shifted from measurement validation to group comparisons. Study 2 investigated whether and how the SOE differs across menopausal status and sexual context. In addition to quantitative comparisons using the ORS and BSOS, Study 2 incorporated questions of physical and psychological intensity and effort, as well as qualitative reflections from post-menopausal women, to capture developmental changes in orgasm experience across the lifespan. Whereas Study 1 focused on whether the instruments were appropriate for use across adulthood, Study 2 explored what those instruments reveal about women's orgasm experiences.

Exploring Changes in the Subjective Orgasm Experience for Women Over Adulthood

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Abstract

While the experience of orgasm is widely recognized as an indicator of sexual well-being, research has predominantly focused on its occurrence, or lack thereof, rather than how it is subjectively experienced. Although women's sexual experiences vary across adulthood and the menopausal transition, how the *subjective orgasm experience* (SOE) differs between menopausal status has not been examined. This cross-sectional, mixed-methods study was designed to investigate differences in women's orgasm experiences across the adult lifespan, the impact of sexual context (solitary vs. partnered), and how post-menopausal women describe changes in their orgasm experiences over adulthood. A total of 545 participants (226 pre-menopausal, 18-46 years; 132 peri-menopausal, 46-53 years; 187 post-menopausal, 53-82 years) completed an online self-report questionnaire package assessing recent orgasm experiences, including the Orgasm Rating Scale, Bodily Sensations of Orgasm Scale, as well as questions regarding physical and psychological intensity and effort. Post-menopausal women also provided qualitative reflections on how their orgasm experiences have evolved. Post-menopausal women reported fewer physical sensations, although reported intensity did not differ across groups, with the notable exception that post-menopausal women reported greater physical intensity than peri-menopausal women in the solitary context. Pre-menopausal women reported exerting the most effort to reach orgasm in both sexual contexts. Across all groups, partnered orgasms were rated higher than solitary orgasms in most domains. Qualitative findings revealed variation in post-menopausal women's orgasm experiences, challenging the notion of an inevitable age-related decline in sexual functioning. Clinically, fewer physical sensations may reflect the physiological reality of ageing and menopause, however, the significant variation in reports of post-menopausal women highlights the importance of recognizing the diversity of sexual expression

in later life. The results also illustrate the value of integrating quantitative and qualitative methods to capture women's nuanced sexual experiences to better support sexual well-being.

Keywords: Orgasm, Menopause, Ageing, Sexual Context, Subjective Orgasm Experience, Mixed Methods, Women's Sexuality

Introduction

Orgasm is often considered the peak of sexual pleasure and an indicator of sexual well-being, yet empirical research has primarily focused on occurrence rather than the subjective qualities (Mah & Binik, 2002). Notably, little is known about how women experience orgasm across the adult lifespan or how these experiences vary by sexual context. Most existing studies do not address how cognitive-affective, sensory, and physiological dimensions of orgasm differ by menopausal status and relational context (Arcos-Romero & Sierra, 2019; Webb et al., 2022). While there is growing recognition of developmentally informed approaches to female sexuality, studies that explore the subjective orgasm experience (SOE) in later adulthood remain limited (DeLamater & Koepsel, 2015; Thomas & Thurston, 2016). This study is an important step in addressing these gaps through a mixed-methods investigation of women's orgasm experiences across adulthood and sexual contexts.

Lifespan Perspective on the Subjective Orgasm Experience

Although many women remain sexually active and satisfied well into their later decades (Avis et al., 2009; Beckman et al., 2008; Lindau et al., 2007), ageing is often accompanied by sociocultural assumptions that render older women invisible as sexual beings (Gewirtz-Meydan et al., 2018; Heywood et al., 2019) and reinforce the belief that their sexual experiences and functioning inevitably decline (Fileborn et al., 2015). Research on women's sexual development often emphasizes desire for, or frequency of activity, with orgasm typically treated as a binary variable (occurred/did not occur) rather than a complex experience. When age is examined as a variable, broad chronological and inconsistent age categories tend to be used (e.g., 18-34, 35-49, 50+), which may obscure meaningful physiological and psychosocial transitions associated with different life stages and menopause.

Menopause is best understood as a biopsychosocial transition involving hormonal shifts, bodily changes, and evolving relational dynamics (Briggs & Kovacs, 2015; Thomas & Thurston, 2016). Dennerstein and colleagues (2001) found that menopausal stage, rather than age, was a stronger predictor of reduced sexual functioning, reinforcing the need to assess SOE by menopausal stage. Understanding these menopausal stages also allows for more precise examination of physiological and psychosocial changes that may shape sexual functioning and orgasm in later life. To address this limitation, we defined menopausal status by the STRAW Staging System (i.e., a standardized framework used to define and classify the reproductive ageing process in women; Soules et al., 2001), rather than chronological age.

Ageing and menopause are associated with biological changes that can influence women's sexual functioning and orgasmic experience, including reduced genital sensitivity, lubrication, and pelvic muscle tone, as well as increased dyspareunia and delayed orgasm (Ambler et al., 2012; Nappi & Palacios, 2014; Nazarpour et al., 2017). These changes include multiple physiological systems (e.g., reproductive, cardiovascular, neural) and are linked to increased prevalence of sexual difficulties with age as well as during and after the menopausal transition (Ambler et al., 2012; Dennerstein et al., 2002; García et al., 2022; Graham, 2014; Laumann et al., 1994, 1999, 2006; Lee et al., 2016; Lindau et al., 2007; Thomas & Thurston, 2016). Importantly, these biological shifts can be further shaped by psychosocial factors such as relationship quality, body image, and sexual self-confidence, with some women reporting enhanced sexual experiences due to greater self-awareness and relief from reproductive concerns (DeLamater & Koepsel, 2015; Thomas & Thurston, 2016). Given the multifaceted changes that occur with ageing and menopause, a more nuanced understanding of orgasm, beyond just occurrence, is essential.

Subjective Orgasm Experience: Models and Measures

Theoretical work by Mah and Binik (2002) marked a shift away from occurrence-based conceptualizations by introducing the Multidimensional Model of the Subjective Orgasm Experience (MMSOE), which differentiates between cognitive-affective and sensory sensations of orgasm. The cognitive-affective dimension captures subjective evaluations and emotional responses to orgasm, comprising four factors: emotional intimacy, ecstasy, pleasurable satisfaction, and relaxation. The sensory dimension reflects the perception of physiological events, represented by six factors: building sensations, flooding sensations, flushing sensations, shooting sensations, throbbing sensations, and general spasms. This model informed the development of the Orgasm Rating Scale (ORS), a validated measure of the subjective and psychological components of orgasm (Mah & Binik, 2002, 2005). The original factor structure of the ORS has since been confirmed and validated for use with older adult women, with the removal of the item "close" due to its failure to contribute to a simple factor structure (Webb et al., 2022). These findings provide further support for the validity of the model.

To capture the bodily and physiological sensations of orgasm, Courtois and colleagues (2011) originally developed the Bodily Sensations of Orgasm Scale (BSOS) to assess orgasm responses in individuals with spinal cord injuries, and later adapted the measure for use with nonclinical participants (Dubray et al., 2017). The BSOS measures extragenital sensations, genital sensations and spasms, nociceptive sensations, and sweating responses, and has demonstrated high internal consistency and temporal stability. When used alongside the ORS, it offers a valuable and multidimensional assessment of the SOE (Dubray et al., 2017). Although Webb and colleagues (2022) largely replicated the original model, an alternative three-factor solution emerged, combining the final two dimensions into extragenital sensations, genital

sensations and spasms, and nociceptive sensations and sweating responses. Three items were removed: “abdominal contraction” (low communalities), “anal contraction” (poor factorability), and “moaning” (conceptually different, reflecting a largely voluntary rather than involuntary response).

Recently, Spanish researchers have further expanded the study of SOE by validating a shortened 25-item version of the Orgasm Rating Scale (ORS) with a revised four-factor structure: affective, sensory, intimacy, and rewards. The scale has been applied across various groups, including individuals with and without orgasm difficulties, varying gender identities and sexual orientations, and in both solitary and partnered contexts (Arcos-Romero et al., 2018; Arcos-Romero & Sierra, 2019; Cervilla et al., 2022, 2024; Mangas et al., 2024). Their findings showed that SOE scores declined with age, are higher in partnered contexts, and are lower among individuals with orgasm difficulties and/or LGBTQIA+ identities (Arcos-Romero & Sierra, 2019, 2022; Muñoz-García et al., 2023). Dyadic studies further revealed that relationship satisfaction was linked to the rewards dimension of SOE through partner effects, while sexual satisfaction was less consistently related, particularly in same-sex female couples (Mangas et al., 2025; Pérez-Amorós et al., 2024).

However, methodological caveats limit the generalizability of these findings. Younger cohorts were most often included in the validation studies, and the age groupings unintentionally blurred distinctions related to menopausal status. An additional limitation lies in the interpretation of the ORS. Whereas Spanish researchers scored items based on the *intensity* of the orgasm experience, the original version and the present study interpret scores as reflecting how accurately the adjectives *describe* the orgasm. This key difference may impact construct validity and limit cross-study and cross-cultural comparability.

Notably, these studies did not employ the BSOS or examine SOE from a developmental perspective. The present study builds on this foundational work by using both the ORS and BSOS to assess SOE across clearly defined menopausal stages and sexual contexts.

A growing body of research highlights the complexity and variability of women's sexual experiences in later life, shaped by biopsychosocial factors. Qualitative studies have been instrumental in capturing this variability, revealing that older women report increased emotional intimacy, changing priorities, and heightened bodily awareness (Hinchliff et al., 2010; Sinković & Towler, 2019; Thomas et al., 2018). These accounts reflect diverse experiences shaped by physical and mental health, relationship dynamics, and sociocultural influences (Gewirtz-Meydan et al., 2019). Broader research also documented variation in sexual satisfaction, attitudes, behaviour, and functioning (Addis et al., 2006; Ambler et al., 2012; Avis et al., 2009; Bell & Reissing, 2017; Buczak-Stec et al., 2021; Curley & Johnson, 2022; Laumann et al., 2006; Nazarpour et al., 2018; Towler et al., 2021). However, little is known about whether similar variability extends to orgasm, particularly across menopausal stages and sexual contexts. Few studies have directly examined the subjective qualities of orgasm using qualitative methods or integrated them with validated quantitative measures.

Purpose of Study

This cross-sectional, mixed-methods study was designed to address these gaps by describing the SOE, examining potential differences across adulthood, and identifying distinctions between solitary and partnered contexts. Quantitative analyses compared menopausal status groups across components of SOE, while qualitative data provided deeper insight into post-menopausal women’s orgasm experiences. It was hypothesized that post-menopausal women would report fewer physical sensations (i.e., sensory sensations and bodily

and physiological sensations), lower physical intensity, and greater effort to reach orgasm compared to pre- and peri-menopausal women. With respect to sexual context, solitary orgasms were expected to involve more physical sensations and physical intensity, whereas partnered orgasms were anticipated to involve more cognitive-affective sensations and psychological intensity.

Materials and Methods

Participants

Data were drawn from the same sample as Study 1. Although most participants overlapped across studies, the final analytic sample for Study 2 was reduced to those participants who had completed both solitary and partnered questions, in accordance with the within-subjects design of the quantitative analyses conducted. A total of 671 individuals accessed the online survey. To be eligible, participants were required to be at least 18 years of age, assigned female at birth, fluent in English, and have experienced an orgasm alone or with a partner. Participants were excluded from analyses if they did not respond to questions (n = 47), had never experienced orgasm (n = 5), were missing data on key measures (n = 20), or had undergone a hysterectomy or oophorectomy (n = 14). For the quantitative analyses, participants who did not respond to both sexual context questions were excluded (23 solitary, 3 partnered pre-menopausal; 3 solitary, 4 partnered peri-menopausal; and 3 solitary, 4 partnered post-menopausal). For the qualitative analyses, participants were excluded if they chose not to respond (n = 13) or misinterpreted the question (n = 5; e.g., they described solitary orgasms when asked about partnered orgasms, or vice versa). There were no other exclusion criteria.

Power analysis using G*Power determined that a minimum of 158 participants per group was necessary to achieve 80% power (Serdar et al., 2021). In total, 545 participants were

retained for the quantitative analyses (226 pre-menopausal, 132 peri-menopausal, and 187 post-menopausal women), and 176 post-menopausal women were included in the qualitative analyses.

Menopausal status was determined using the STRAW Staging System decision tree (i.e., a standardized framework used to define and classify the reproductive ageing process in women; Harlow et al., 2007; Soules et al., 2001; Webb et al., 2022), which was applied independently by two researchers, demonstrating almost perfect agreement (Kappa = 0.86, $p < 0.001$, 95% CI [0.78, 0.94]).

Procedure

Participants were recruited via online advertisements (e.g., Facebook, Twitter, Reddit), posters placed at various locations (e.g., gyms, coffee shops) in a Canadian metropolitan city, and by word of mouth. Participants completed an online questionnaire package on Qualtrics XM (Provo, UT), including questions about recent orgasm experiences in solitary and partnered contexts. All women (pre-, peri-, and post-menopausal) were asked to complete demographic, quantitative, and qualitative questions; however, only the qualitative data from post-menopausal women were used in the analyses for the current study. The researchers' university research ethics committee approved the procedures of this research.

Measures

Personal and Relationship Demographics

Participants provided demographic data, including ethnicity, country of residence, annual income, and highest level of educational attainment. Additional self-reported data encompassed religiosity, sexual attraction, relationship status, relationship duration, and relationship satisfaction, where applicable. Data collection also included current menopausal

symptomatology (both physical and psychological manifestations), along with self-assessed ratings of mental and physical health for both participants and their partners (where applicable).

Orgasm Experiences

Orgasm Rating Scale (ORS; Mah & Binik, 2002). This self-report measure assessed a recent orgasm experience on cognitive-affective and sensory dimensions and has been validated for use in solitary and partnered contexts (Mah & Binik, 2002; Webb et al., 2022) and for this study with women across adulthood (Webb et al., 2022). The cognitive-affective dimension refers to subjective evaluations and emotions associated with orgasm (e.g., relaxing, pleasurable), and the sensory dimension refers to the global perception of physiological events (e.g., pulsating, flooding). The ORS contains 27 adjectives ("close" removed due to failure to contribute to a simple factor structure; Webb et al., 2022) and participants were asked to rate how well the items described their most recent orgasm experience on a 6-point Likert scale, ranging from *does not describe it at all* (1), to *describes it perfectly* (6). Higher scores indicated more cognitive-affective and sensory sensations with orgasm. Cronbach's alphas were previously reported to range from α = .88 - .96 (Mah, 2000; Mah & Binik, 2002; Webb et al., 2022). In this study, Cronbach's alpha for the total ORS scale ranged from α = .92 - .96 (See Appendix Internal Consistency Tables for all scale and subscale scores).

Bodily Sensations of Orgasm Scale (BSOS; Dubray et al., 2017). This self-report measure assesses the perception of bodily (e.g., lower limb spasms) and physiological (e.g., increased blood pressure) sensations related to orgasm in solitary and partnered contexts (Courtois et al., 2011; Dubray et al., 2017; Webb et al., 2022) and, for this study, was validated for women across adulthood (Webb et al., 2022). The BSOS was based on a three-dimensional model including extragenital sensations (e.g., increased heart rate), genital sensations and spasms

(e.g., clitoral pulsation), and nociceptive sensations and sweating responses (e.g., intracranial pressure, hot flashes; Courtois et al., 2011; Dubray et al., 2017; Webb et al., 2022). Participants were asked to rate the degree to which they experienced each sensation during orgasm on a 5-point Likert scale, ranging from *not at all* (1), to *extremely* (5). Higher scores indicated more bodily and physiological sensations. The temporal stability of the measure was deemed acceptable (r = .74; Dubray et al., 2017). Moderate-high internal consistency with Cronbach's alpha ranged from α = .65 - .92 (Dubray et al., 2017; Webb et al., 2022). Cronbach's alpha for the total BSOS scale in this study ranged from α = .89 - .92 (See Appendix Internal Consistency Tables for all scale and subscale scores).

Physical Intensity, Psychological Intensity, and Effort

Three questions assessed the participants' perceived physical and psychological intensity with orgasm and the effort necessary to experience orgasm in both sexual contexts. These questions had previously been used in the original validation study of the ORS (Mah & Binik, 2002). Participants were given the prompts, "During or after this orgasm, you may have experienced physical sensations throughout your body (e.g., spasms, throbbing, tension). How intense were these physical sensations overall?" and "During or after this orgasm you may have experienced other feelings that were more psychological rather than physical (e.g., satisfaction, feelings of peacefulness or relaxation, ecstasy, love). How intense were these feelings overall?" Participants rated intensity on a 5-point Likert scale, ranging from *very weak* (1), to *very strong* (5).

Questions evaluating effort to experience orgasm were modified from the Self-Assessment of Genital Anatomy and Sexual Functioning for Females (SAGASF-F; Schober et al., 2004). This tool examines multiple aspects of female genital anatomy, sensitivity,

pain/discomfort, and sexual function. For orgasm effort, participants were given the prompt, "In general, how much effort does it take for you to have an orgasm through masturbation (or with a sexual partner)?" Participants rated effort on a 5-point Likert scale, ranging from *no effort* (1), to *it takes significant effort* (5).

Qualitative Account of Orgasm Experiences over Adulthood

A total of 187 post-menopausal participants were asked to reflect on their orgasm experiences in both solitary and dyadic contexts across the lifespan using the following questions: “How has your experience of orgasm, through masturbation / with a sexual partner, changed throughout your life?” Of these participants, 176 provided narrative responses. Responses were collected through an unrestricted free-text field embedded within the online survey. No minimum or maximum word or character limits were imposed, allowing participants to elaborate on their experiences to the extent they wished.

Analysis Plan

Analyses were conducted in IBM SPSS Statistics (Version 29). A doubly multivariate design tested the effects of menopausal status (pre-, peri-, post-menopause; between-subjects) and sexual context (solitary, partnered; within-subjects) on 19 SOE outcomes (ORS, BSOS, intensity, effort). Wilks’ Lambda was used as the primary multivariate statistic, given that group cell sizes did not exceed a 2:1 ratio. Significant effects of menopausal status were followed by one-way Analyses of Variance (ANOVAs) to identify contributing outcomes. Pairwise comparisons further clarified differences across menopausal status groups and between sexual contexts (paired-samples t-tests). Statistical significance was set at $\alpha = .05$. Descriptive statistics (means, standard deviations, and sample characteristics) were also reported to contextualize findings.

Assumptions of homogeneity of variances were examined using Hartley's *F*max test, given that the doubly multivariate design included both between-subjects and within-subjects multivariate factors. Variance-covariance matrices of the dependent variables were manually inspected and compared across the largest group (pre-menopause) and the smallest group (peri-menopause). All *F*max ratios were less than 4:1, consistent with recommended guidelines (e.g., Howell, 2013), indicating that the analyses were sufficiently robust and the risk of inflated Type I error was minimal.

In addition to the quantitative analyses, qualitative content analysis was used to examine post-menopausal women's descriptions of orgasm experiences across adulthood. Responses were systematically coded and categorized to identify patterns and quantify themes across sexual contexts (Saldana, 2009; Wilkinson & Birmingham, 2003). Categories captured explicit content (direct accounts) and implicit meanings (underlying assumptions or interpretations; Guest et al., 2014). An inductive approach was used, with codes and categories generated directly from the data given the limited prior research on post-menopausal orgasm phenomenology (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005; Vaismoradi et al., 2013).

Data Considerations

The quantitative data were inspected to identify potentially suspect cases (e.g., incomplete) and outliers. Frequency distributions were performed for each variable to inspect plausibility, correct coding, and missing data. Participants missing an entire sexual context were excluded and participants with item-level missingness (ORS, BSOS) were retained and handled via Expectation Maximization as all variables had <10% missing data.

The qualitative data were analyzed using a content analysis approach. Qualitative software, QDA Miner (Version 5), was used for data management and coding. Content analysis

involved five main steps (Saldana, 2009; Wilkinson & Birmingham, 2003). Firstly, in the preparation stage, the first and third authors independently read and reread the narrative text until an understanding of the data as a whole emerged (Hsieh & Shannon, 2005; Vaismoradi et al., 2013). Each reviewer logged thoughts, decisions, questions, and conclusions comprehensively to discuss discrepancies in coding. Secondly, the quoted text, drawn from the narratives, was used to determine the underlying codes (Wilkinson & Birmingham, 2003). Codes were reread, reviewed, revised, and recoded until each code represented one clear concept. The quoted text was allowed to contain multiple codes, if applicable. For example, the statement "My orgasms have gotten more intense over my life, but I have to put more work in to have one" would include codes "intensity" and "effort." The third author worked simultaneously and independently to code ten predetermined participant responses per question. The coding structure was revised to reflect the required changes in coding interpretation and discussions with the third author. This process was repeated until there was coding agreement between the two raters. A predetermined third reviewer was not needed for tie-breaking decisions. Thirdly, codes with similar meanings were then collapsed into broader categories (Graneheim & Lundman, 2004; Wilkinson & Birmingham, 2003). The revision of categories was an ongoing task as categories were revised, removed, and added. The first and third author met again to discuss the agreement on categories. Finally, definitions of each category were produced (Hsieh & Shannon, 2005). The first and third authors met to discuss the final structure of the definitions.

Results

Descriptive Statistics

The sample predominately consisted of economically diverse, educated, White women, from North America. Most peri-menopausal women (94%) and 58% of post-menopausal women

reported currently experiencing physical and/or psychological symptoms of menopause. Further details on demographic variables are summarized in Table 1.

Table 1

Sample Demographics by Menopausal Status

Variable	Pre-menopause	Peri-menopause	Post-menopause
Age (years, *M* ± *SD*)	28.65 ± 8.76	49.82 ± 3.17	60.32 ± 6.22
Ethnicity, n (%)	203	97	183
Asian	22 (10.8)	5 (5.1)	2 (1.1)
Black	17 (8.2)	8 (8.1)	11 (6.0)
First Nations	2 (0.8)	4 (4.1)	3 (1.6)
Hispanic	11 (5.6)	1 (1)	4 (2.2)
Unspecified-Multiracial	5 (2.6)	3 (3.1)	2 (1.1)
White	146 (71.9)	76 (78.3)	161 (88)
Country/Continent, n (%)	203	98	183
Australia	3 (1.5)	1 (1)	-
Canada	43 (21.2)	6 (6.1)	8 (4.4)
India	9 (4.4)	2 (2)	2 (1.1)
United Kingdom	8 (3.9)	1 (1)	2 (1.1)
United States of America	140 (69)	88 (89.8)	171 (93.4)
Annual income, n (%)	203	99	186
>$25,000	49 (24.4)	17 (17.2)	35 (18.8)
$25,000-$49,999	54 (26.7)	20 (20.2)	57 (30.6)
$50,000-79,999	48 (23.5)	28 (28.3)	44 (23.6)
$80,000-119,999	33 (16.1)	21 (21.2)	35 (18.8)
>$120,000	19 (9.3)	13 (13.1)	15 (8)
Education, n (%)	203	99	183
High school	63 (31.3)	22 (22.2)	47 (25.6)
College/Undergraduate	93 (45.7)	50 (50.5)	100 (54.6)
Graduate degree	31 (15.1)	17 (17.1)	17 (9.2)
Postgraduate degree	16 (7.9)	10 (10.1)	19 (10.4)
Religiosity, n (%)	203	100	183
Not at all religious	99 (48.7)	37 (37)	62 (33.9)
A little religious	31 (15.4)	20 (20)	25 (13.7)
Somewhat religious	46 (22.7)	27 (27)	37 (20.2)
Very religious	13 (6.2)	14 (14)	44 (24)
Extremely religious	14 (7)	2 (2)	15 (8.2)
Physical menopausal symptoms, n (%)	-	128	160
Yes	-	120 (93.7)	91 (56.9)
No	-	8 (6.2)	69 (43.1)
Psychological menopausal symptoms, n (%)	-	127	160
Yes	-	117 (92.1)	93 (58.1)
No	-	10 (7.9)	67 (41.9)
Personal physical health (poor(*1*)-excellent(*5*), *M* ± *SD*)	3.40 ± 0.99	3.37 ± 0.99	3.33 ± 1.00
Personal mental health (poor(*1*)-excellent(*5*), *M* ± *SD*)	3.20 ± 1.10	3.64 ± 1.10	3.82 ± 1.03
Sexual attraction, n (%)	203	121	183
Only men	94 (46.3)	84 (69.4)	160 (87.4)
Mostly men	55 (27.1)	24 (19.8)	18 (9.8)
Men and women equally	33 (16.2)	5 (4.1)	1 (0.5)

Mostly women	12 (5.9)	4 (3.3)	1 (0.5)
Only women	9 (4.4)	3 (2.5)	3 (1.6)
None/I don't know	-	1 (0.9)	-
Sexual contact, n (%)	203	121	183
Only men	118 (58.1)	98 (81)	162 (88.5)
Mostly men	64 (31.5)	19 (15.7)	15 (8.2)
Men and women equally	9 (4.4)	2 (1.6)	1 (0.5)
Mostly women	5 (2.4)	-	2 (1.1)
Only women	7 (3.4)	2 (1.6)	3 (1.6)
Relationship status, n (%)	203	121	183
Single	35 (17.3)	8 (6.6)	19 (10.2)
Single, casually dating	28 (13.7)	5 (4.1)	7 (3.7)
Committed, not living together	42 (20.8)	11 (9.1)	14 (7.9)
Committed, living together	38 (19)	25 (20.7)	19 (10.2)
Married	56 (27.4)	60 (49.6)	83 (45.5)
Divorced	4 (1.8)	9 (7.4)	30 (16.6)
Widowed	-	3 (2.5)	11 (5.9)
Partner's physical health (poor(*1*)-excellent(*5*), *M* ± *SD*)	3.67 ± 1.05	3.61 ± 0.99	3.39 ± 0.96
Partner's mental health (poor(*1*)-excellent(*5*), *M* ± *SD*)	3.57 ± 1.09	3.96 ± 0.96	3.64 ± 1.05
Length of Relationship, n (%)	203	121	183
0 - 6 Months	42 (20.6)	12 (10)	17 (9.2)
6 Months - 2 Years	62 (30.7)	15 (12.4)	56 (30.6)
2+ Years	99 (48.7)	94 (77.6)	110 (60.1)
Relationship satisfaction (extremely dissatisfied(*1*)-extremely satisfied(*5*), *M* ± *SD*)	4.22 ± 1.04	4.19 ± 1.05	3.84 ± 1.28

Subjective Orgasm Experience Across Menopausal Status and Context

A doubly multivariate design examined effects of menopausal status and sexual context on 19 SOE dimensions.

Sexual Context and Menopausal Status Interaction

The interaction between sexual context and menopausal status was not significant, $F(2, 542) = 2.18$, *Wilks' Λ* = .008, $p = .114$, indicating that the magnitude of sexual context differences did not vary across menopausal groups. No further pairwise comparisons were completed.

Table 2

One-Way Analysis of Variance - Main Effects of Menopausal Status on Orgasm

	df	*SS*	*MS*	*F*	*p*	η^2	95% CI
Solitary Context							
BSOS							
Overall Bodily and Physiological Sensations							
Between groups	2	15.31	7.65	16.94	.000	.06	.02, .10
Within groups	542	244.90	0.45				
Total	544	260.21					
Extragenital Sensations							
Between groups	2	23.69	11.85	15.95	<.001	.06	.02, .09
Within groups	542	402.48	0.74				
Total	544	426.17					
Genital Sensations and Spasms							
Between groups	2	12.37	6.19	7.29	.001	.03	.00, .06
Within groups	542	460.07	0.85				
Total	544	472.45					
Nociceptive Sensations and Sweating Responses							
Between groups	2	12.85	6.43	13.32	.000	.05	.02, .08
Within groups	542	261.49	0.48				
Total	544	274.34					
Intensity & Effort							
Physical Intensity							
Between groups	2	6.09	3.05	3.00	.051	.01	.00, .03
Within groups	542	550.06	1.01				
Total	544	556.15					
Effort							
Between groups	2	6.96	3.48	3.47	.032	.01	.00, .04
Within groups	542	542.85	1.00				
Total	544	549.80					
Partnered Context							
ORS							
Sensory Sensations							
Between groups	2	10.69	5.34	4.36	.013	.02	.00, .04
Within groups	542	664.72	1.23				
Total	544	675.40					
Flooding Sensations							
Between groups	2	21.26	10.63	4.34	.013	.02	.00, .04
Within groups	542	1326.55	2.45				
Total	544	1347.81					
Flushing Sensations							
Between groups	2	20.94	10.47	4.89	.008	.02	.00, .04
Within groups	542	1160.30	2.14				
Total	544	1181.23					
General Spasms							
Between groups	2	36.64	18.32	7.15	.001	.03	.00, .06
Within groups	542	1389.50	2.56				
Total	544	1426.13					
BSOS							
Overall Bodily and Physiological Sensations							
Between groups	2	20.03	10.02	19.43	.000	.07	.03, .11
Within groups	542	279.39	0.52				
Total	544	299.43					

Extragenital Sensations							
Between groups	2	36.15	18.07	23.46	.000	.08	.04, .12
Within groups	542	417.60	0.77				
Total	544	453.75					
Genital Sensations and Spasms							
Between groups	2	10.05	5.03	5.45	.005	.02	.00, .05
Within groups	542	499.55	0.92				
Total	544	509.61					
Nociceptive Sensations and Sweating Responses							
Between groups	2	18.47	9.24	16.28	.000	.06	.02, .10
Within groups	542	307.43	0.57				
Total	544	325.90					
Intensity & Effort							
Effort							
Between groups	2	7.66	3.83	3.51	.031	.01	.00, .04
Within groups	542	591.22	1.09				
Total	544	598.88					

Main Effect of Menopausal Status (Table 2)

A significant main effect of menopausal status was found, $F(2, 542) = 5.62$, $p = .004$, $\eta^2_p = .02$ indicating that across both sexual contexts, SOE differs depending on menopausal status. Table 2 presents the main effects of menopausal status on SOE, and Table 3 provides the measure items, full-sample descriptive statistics, and post hoc comparisons across menopausal status and sexual context.

Cognitive-Affective Sensations. There were no main effects of menopausal status on any cognitive-affective sensations in either sexual context.

Sensory Sensations. A small main effect of menopausal status emerged for overall sensory sensations, flooding sensations, flushing sensations and general spasms in the partnered context. Pairwise comparisons indicated that pre-menopausal women perceived significantly more overall sensory sensations than peri-menopausal women ($M_D = 0.35$, $SE = 0.12$, 95% CI [.11, .59], $p = .004$). Pre-menopausal women exhibited more flooding sensations than both peri- ($M_D = 0.43$, $SE = 0.17$, 95% CI [.09, .77], $p = .013$) and post-menopausal women ($M_D = 0.38$, $SE = 0.15$, 95% CI [.07, .68], $p = .015$), as well as more flushing sensations than peri-menopausal women ($M_D = 0.47$, $SE = 0.16$, 95% CI [.15, .78], $p = .004$). Post-menopausal women, in turn,

reported more flushing sensations than peri-menopausal women (M_D = -0.45, SE = 0.17, 95% CI [-.77, -.12], p = .008). Pre-menopausal women perceived more general spasms compared to both peri- and post-menopausal women (M_D = 0.62, SE = 0.18, 95% CI [.27, .96], p < .001; M_D = 0.43, SE = 0.16, 95% CI [.12, .74], p = .007, respectively).

Bodily and Physiological Sensations. A main effect of menopausal status was observed for all bodily and physiological sensations in both sexual contexts. Pairwise comparisons indicated that pre-menopausal women reported greater perceptions of all bodily and physiological sensations compared to both peri- and post-menopausal women across the solitary context (Overall bodily and physiological sensations, peri- M_D = 0.38, SE = 0.07, 95% CI [.23, .52], p = < .001 and post- M_D = 0.30, SE = 0.07, 95% CI [.17, .43], p < .001; extragenital sensations, peri- M_D = 0.44, SE = 0.09, 95% CI [.25, .63], p < .001 and post- M_D = 0.41, SE = 0.08, 95% CI [.24, .58], p < .001; genital sensations and spasms, peri- M_D = 0.38, SE = 0.10, 95% CI [.18, .58], p < .001 and post- M_D = 0.19, SE = 0.09, 95% CI [.02, .37], p = .033; nociceptive sensations and sweating responses, peri- M_D = 0.32, SE = 0.08, 95% CI [.17, .47], p < .001 and post- M_D = 0.30, SE = 0.07, 95% CI [.17, .44], p < .001).

The same results were found in the partnered context, pre-menopausal women reported greater sensations in all bodily and physiological sensations (Overall bodily and physiological sensations, peri- M_D = 0.41, SE = 0.08, 95% CI [.26, .57], p < .001 and post- M_D = 0.37, SE = 0.07, 95% CI [.23, .51], p < .001; extragenital sensations, peri- M_D = 0.52, SE = 0.10, 95% CI [.33, .71], p < .001) and post- M_D = 0.52, SE = 0.09, 95% CI [.35, .69], p < .001; genital sensations and spasms, peri- M_D = 0.31, SE = 0.10, 95% CI [.11, .52], p = .003 and post- M_D = 0.24, SE = 0.09, 95% CI [.50, .42], p = .013; nociceptive sensations and sweating responses, peri- M_D = 0.40, SE = 0.08, 95% CI [.24, .56], p < .001 and post- M_D = 0.35, SE = 0.07, 95% CI

[.20, .50], $p < .001$). Medium effect sizes were found for overall bodily and physiological sensations and extragenital sensations in both the solitary and partnered contexts and nociceptive sensations in the partner context; all other effects were small.

Physical and Psychological Intensity. In the solitary context, a small main effect of menopausal status emerged for physical intensity, with post-menopausal women rating their solitary orgasms as more physically intense than those of peri-menopausal women *(M_D* = -0.27, *SE* = 0.11, 95% CI [-.50, -.05], $p = .017$). No other pairwise differences in intensity by menopausal status were significant.

Effort. There was a small main effect of menopausal status on orgasm effort in both contexts. It takes pre-menopausal women significantly more effort than peri- and post-menopausal women to have solitary and partnered orgasms (Solitary: peri- $M_D = 0.25$, $SE = 0.11$, 95% CI [.04, .47], $p = .021$ and post- $M_D = 0.21$, $SE = 0.10$, 95% CI [.01, .40], $p = .037$; Partnered: peri- $M_D = 0.28$, $SE = 0.11$, 95% CI [.05, .50], $p = .016$ and post- $M_D = 0.20$, $SE = 0.10$, 95% CI [.00, .41], $p = .047$).

Table 3

Measure Items and Full Sample Descriptive Statistics

	Solitary						Partnered					
	Pre		Peri		Post		Pre		Peri		Post	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
ORS												
Cognitive-Affective Dimension	3.54*b*	1.23	3.53*b*	0.93	3.62*b*	1.10	4.37*b*	1.06	4.21	1.17	4.23*b*	1.27
Emotional Intimacy	2.29*b*	1.52	2.15*b*	1.29	2.33*b*	1.49	4.27*b*	1.35	4.38	1.41	4.26*b*	1.52
Ecstasy	3.14*b*	1.58	2.84*b*	1.39	3.10*b*	1.61	3.77*b*	1.47	3.39	1.58	3.58*b*	1.67
Pleasurable Satisfaction	4.83*b*	1.24	5.11	0.94	4.86	1.19	5.26*b*	0.92	5.14	1.05	5.02	1.25
Relaxation	3.90	1.65	4.00	1.46	4.18	1.41	4.17	1.52	3.94	1.55	4.05	1.55
Sensory Dimension	3.28*b*	1.14	3.14	0.96	3.27	1.05	3.54*ab*	1.07	3.19*a*	1.13	3.36	1.14
Building Sensations	3.79	1.48	3.70	1.33	3.88	1.27	4.01	1.34	3.92	1.49	3.92	1.42
Flooding Sensations	2.83*b*	1.64	2.49	1.47	2.84	1.47	3.14*ab*	1.57	2.71*a*	1.62	2.76*a*	1.52
Flushing Sensations	2.93*b*	1.48	2.66	1.28	3.00	1.43	3.14*ab*	1.44	2.68*a*	1.40	3.12*a*	1.54
Shooting Sensation	2.37	1.48	2.11	1.38	2.33	1.47	2.54	1.46	2.22	1.36	2.38	1.45
Throbbing Sensations	4.15	1.53	4.38*b*	1.46	4.00	1.46	4.27	1.47	4.08*b*	1.59	4.28	1.50
General Spasms	3.60*b*	1.71	3.51	1.56	3.56	1.51	4.13*ab*	1.52	3.51*a*	1.73	3.70*a*	1.60
BSOS												
Bodily and Physiological Sensations	2.69*ab*	0.69	2.31*ab*	0.58	2.38*ab*	0.71	2.98*ab*	0.68	2.57*ab*	0.69	2.61*ab*	0.78
Extragenital Sensations	3.18*ab*	0.85	2.74*ab*	0.84	2.77*ab*	0.90	3.55*ab*	0.82	3.03*ab*	0.90	3.02*ab*	0.93
Genital Sensations and Spasms	3.12*ab*	0.94	2.74*ab*	0.86	2.92*ab*	0.94	3.40*ab*	0.89	3.09*ab*	1.01	3.16*ab*	1.00
Nociceptive Sensations and Sweating Responses	1.76*ab*	0.77	1.44*ab*	0.50	1.46*ab*	0.72	2.01*ab*	0.79	1.60*ab*	0.57	1.65*ab*	0.82
Intensity & Effort												
Physical Intensity	3.47*b*	0.97	3.26*ab*	0.98	3.53*a*	1.07	3.84*b*	0.90	3.69*b*	1.07	3.64	1.06
Psychological Intensity	3.23*b*	1.23	3.04*b*	1.09	3.31*b*	1.15	3.91*b*	0.96	3.72*b*	1.11	3.71*b*	1.08
Effort	2.59*ab*	1.02	2.34*ab*	0.92	2.39*ab*	1.03	3.12*ab*	0.86	2.84*ab*	1.08	2.91*ab*	1.21

Note. a indicates a significant pairwise comparison between menopausal status groups; *b* indicates a significant pairwise comparison between sexual contexts; $N = 545$; Pre-menopausal $n = 226$; Peri-menopausal $n = 132$; Post-menopausal $n = 187$.

Table 4

Repeated T-Test Comparisons - Significant Differences in Orgasm between Sexual Contexts

	Pre				Peri				Post			
Source	*t*(226)	*p*	*d*	95% CI	*t*(132)	*p*	*d*	95% CI	*t*(187)	*p*	*d*	95% CI
ORS												
Cognitive-Affective Sensations	-8.05	.000	.53	-.67, -.39	-6.39	.000	.56	-.74, -.37	-5.02	.000	.37	-.51, -.22
Emotional Intimacy	-14.94	.000	.99	-1.15, -.83	-14.54	.000	1.27	-1.49, -1.03	-12.27	.000	.90	-1.07, -.73
Ecstasy	-4.73	.000	.31	-.45, -.18	-3.59	.000	.31	-.49, -.14	-2.97	.003	.22	-.36, -.07
Pleasurable Satisfaction	-4.15	.000	.28	-.41, -.14	-	-	-	-	-	-	-	-
Relaxation	-	-	-	-	-	-	-	-	-	-	-	-
Sensory Sensations	-2.95	.004	.20	-.33, -.06	-	-	-	-	-	-	-	-
Building Sensations	-	-	-	-	-	-	-	-	-	-	-	-
Flooding Sensations	-2.25	.026	.28	-.28, -.02	-	-	-	-	-	-	-	-
Flushing Sensations	-2.13	.035	.27	-.27, -.01	-	-	-	-	-	-	-	-
Shooting Sensations	-	-	-	-	-	-	-	-	-	-	-	-
Throbbing Sensations	-	-	-	-	1.99	.049	.17	.00, .34	-	-	-	-
General Spasms	-3.68	.000	.38	-.38, -.11	-	-	-	-	-	-	-	-
BSOS												
Bodily and Physiological Sensations	-8.44	.000	.70	-.70, -.42	-5.56	.000	.48	-.66, -.30	-6.25	.000	.46	-.61, -.31
Extragenital Sensations	-7.19	.000	.62	-.62, -.34	-4.46	.000	.39	-.56, -.21	-4.87	.000	.36	-.50, -.21
Genital Sensations and Spasms	-5.04	.000	.47	-.47, -.20	-5.42	.000	.47	-.65, -.29	-4.51	.000	.33	-.48, -.18
Nociceptive Sensations and Sweating Responses	-6.69	.000	.58	-.58, -.31	-3.58	.000	.31	-.49, -.14	-5.45	.000	.40	-.55, -.25
Intensity & Effort												
Physical Intensity	-5.49	.000	.50	-.50, -.23	-4.09	.000	.36	-.53, -.18	-	-	-	-
Psychological Intensity	-7.84	.000	.66	-.66, -.38	-6.12	.000	.53	-.71, -.35	-4.57	.000	.48	-.48, -.19
Effort	-6.13	.000	.54	-.54, -.27	-4.45	.000	.39	-.56, -.21	-5.37	.000	.54	-.54, -.24

Main Effect of Sexual Context (Table 4)

Multivariate tests revealed a significant main effect of sexual context, $F(1, 542) = 102.57$, $p < .001$, *Wilks' Λ* = .84, $\eta^2_p = .16$, indicating that SOE differed systematically between solitary and partnered contexts across all menopausal status groups. Pairwise comparisons confirmed that partnered orgasms were rated higher than solitary orgasms for pre- ($M_D = 0.46$, $SE = 0.05$, 95% CI [.35, .57]), peri- ($M_D = 0.34$, $SE = 0.07$, 95% CI [.20, .48], $p < .001$), and post-menopausal women ($M_D = 0.30$, $SE = 0.06$, 95% CI [.18, .41], $p < .001$).

Pre-Menopause. Pre-menopausal women rated partnered orgasms as having more overall cognitive-affective sensations, emotional intimacy, ecstasy, pleasurable satisfaction, overall sensory sensations, flooding sensations, flushing sensations, general spasms, overall bodily and physiological sensations, extragenital sensations, genital sensations and spasms, nociceptive sensations and sweating responses, physical and psychological intensity, and effort (See Table 4).

Peri-Menopause. Peri-menopausal women rated partnered orgasms as having significantly more overall cognitive-affective sensations, emotional intimacy, ecstasy, throbbing sensations, overall bodily and physiological sensations, extragenital sensations, genital sensations and spasms, nociceptive sensations and sweating responses, physical and psychological intensity, and effort.

Post-Menopause. Post-menopausal women rated partnered orgasms as involving more overall cognitive-affective sensations, emotional intimacy, ecstasy, overall bodily and physiological sensations, extragenital sensations, genital sensations and spasms, nociceptive sensations and sweating responses, psychological intensity and effort.

Categories of Orgasm Experience over Adulthood

Post-menopausal women reflected on how their experiences of orgasm changed with solitary masturbation and a partner over adulthood. In the solitary context, 15 categories emerged from 30 codes; in the partnered context, 15 categories emerged from 47 codes. A complete list of categories, codes, and the number of responses per category can be found in Tables 5 and 6. Category definitions can be found in the Appendix. Of note, 15.5% of women in the solitary context and 10.4% in the partnered context responded that their orgasms had not changed throughout their lives.

Table 5

Frequency of Responses Per Category of Change in Orgasm Experiences Over Lifetime in the Solitary Context

Categories	Codes	+	-	Total # Responses	%
No change	no change	n/a	n/a	43	15.5
Effort	effort	21	18	39	14.1
Intensity	intensity	6	25	31	11.2
Self-knowledge	self-knowledge, self-intimacy, comfort, confidence	28	0	28	10.1
Frequency	frequency	4	23	27	9.7
Experimentation	experimentation, fantasy, sexual aids/toys	18	7	25	9.0
Functional	functional, stress-relief, sleep aid	14	1	15	5.4
Health	health, lubrication, menopause, pain	1	14	15	5.4
Desire	desire, excitement	0	12	12	4.3
Satisfaction	satisfaction	2	7	9	3.2
Sex guilt	sex guilt, shame	1	8	9	3.2
Duration	duration, length	2	5	7	2.5
Compared to partnered	partner comparison	2	5	7	2.5
Pleasure	pleasure, enjoyment	1	6	7	2.5
Privacy	privacy	1	2	3	1.1

Note. n = 172; + indicates an increase, improvement, or more, - indicates a decrease, worsening, or less.

Table 6

Frequency of Responses Per Category of Change in Orgasm Experiences Over Lifetime in the Partnered Context

Categories	Codes	+	-	# Responses	%
Effort	effort	25	13	38	13.7
Self-efficacy	assertiveness, communication, comfort, self-confidence, body image, mindfulness, self-knowledge	31	3	34	12.2
No change	no change	n/a	n/a	29	10.4
Intensity	intensity	3	25	28	10.1
Frequency	frequency, multiple orgasms	6	19	25	9.0
Partner-related factors	Partner knowledge, partner availability, partner characteristics, partner health, partner teachability, penis size, sexual orientation	10	13	23	8.3
Relationship factors	emotional intimacy, relationship quality	15	5	20	7.2
Desire	desire, interest	0	15	15	5.4
Pleasurable	pleasurable, relaxing, importance, liberating	10	3	13	4.7
Adverse states	loss, (non)occurrence, faking, fear, avoidance, sexual assault, sex guilt	9	2	11	4.0
Satisfaction	satisfaction	7	4	11	4.0
Health	children, pregnancy, health, lubrication, energy, physical ability, physical exertion, exercise	3	7	10	3.6
Excitement	excitement, arousal	2	8	10	3.6
Compared to masturbation	masturbation	6	0	6	2.2
Duration	duration	1	4	5	1.8

Note. n = 176; + indicates an increase, improvement, or more, - indicates a decrease, worsening, or less.

Solitary

This section outlines post-menopausal women's three most frequently mentioned solitary categories and examples of categories specific to changes in their solitary orgasms over adulthood. The most mentioned categories were effort, intensity, and self-knowledge, and specific to solitary orgasm categories were functional use and sex guilt.

Some women reflected on orgasm taking more effort, while others mentioned orgasm taking less effort. One participant commented on the increased effort, saying, "…[Orgasm is] harder to achieve, orgasm comes suddenly after a lot of effort." Another participant mentioned

the decrease in effort, "When I was younger, I had to concentrate more, had to be someplace quiet, had to fantasize, it took a lot longer to build tension. Now I can have one from start to finish in five minutes."

Similarly, some women reported that the intensity increased over adulthood, while others reported a decrease in intensity. One participant commented on the increase, saying, "With some medications, I was unable to orgasm at all for over a year period. Now, I seem to be in a good place because I am having the strongest and most prolonged orgasms I have had since right before menopause." Another described the decrease in intensity, "I have never been one to masturbate a lot. But over my life, the experience has become less satisfying than it used to be and less intense. My clitoris is not as sensitive as it used to be."

Reflecting more broadly, participants commented on their sexual self-knowledge and how curiosity and compassion in relation to their sexual self had increased throughout their lives. One participant stated, "It's entirely different as I have gotten older. I take more interest in my body's sensations and reactions, which makes all the experiences I have better."

One category that emerged that was unique to the solitary context was the functional use of orgasm. For example, "After menopause, the hormones just don't work as well, and masturbation typically is something I try when I can't go to sleep," and "I masturbated when I was young much more frequently for pleasure. Now I rarely do, really don't even desire to, unless I am super anxiety-ridden."

Some women also mentioned experiencing changes in feelings of guilt and shame related to masturbation and solitary orgasm; for example, "I started masturbating as a child. When caught by my religious parents, I was shamed…Since becoming an adult, I know orgasms are a healthy part of life. I'm much more free and enjoy them now with no shame." On the other hand,

another woman commented, "[Orgasm with masturbation is] less frequent as there is guilt with it now."

Partnered

This section outlines post-menopausal women's three frequently mentioned categories and examples of categories specific to partnered orgasms over adulthood. The most mentioned categories were effort, intensity, and self-efficacy, and specific to partner orgasm, relationship and partner-specific factors were noted.

In a partnered context, some women reported experiencing increased effort to have orgasm, while others experienced decreased effort over adulthood. One woman commented, "It has gotten so much harder to achieve. It is more like work than pleasure. It happens a lot less as I have gotten older." While another woman commented, "Orgasms with sexual partners have become steadily easier to achieve throughout my life, as my body responds more readily with practice and familiarity."

The intensity of partnered orgasm increased for a few but decreased for most participants over adulthood. One woman commented on the increase in intensity, saying, "[Orgasm has] gotten much easier to achieve and intense as I've aged." More reflective of the majority of responses, a woman observed, "In my 30s, because my drive was so strong, orgasms were often quite strong. In my 40s, the intensity began to decrease, and I started losing interest. Now, in my 50s, I have no interest at all in orgasm with a partner."

Many post-menopausal women reported that orgasms with their partners had been positively influenced by increased assertiveness, better communication with their partner, self-confidence, a positive body image, trying to be more present and aware during sexual activity, and more sexual self-knowledge. One woman commented:

> I am in so much more control. If a man doesn't know what to do, I'll just take over and start pleasuring myself while we are having sex. Or I would tell him something like, "Do this." or "Touch me here." I became more vocal in telling partners how to touch me as I got older.

Categories that emerged that were unique to the partnered context of orgasms included emotional intimacy and relationship quality. One participant commented, "[Before marriage] my orgasms were less satisfying because they lacked the love and meaningful emotion I now experience with my husband." In contrast, another noted, "Yes, it has become very boring, and I am not really attracted to my husband anyway. We are struggling overall in our relationship."

Some women also mentioned partner-specific factors in the context of changes in partnered orgasms over adulthood. Many post-menopausal women thought that partner-specific factors, including partners' sexual knowledge, openness to learning about their sexual preferences, partner availability, personal characteristics, health, penis size, and sexual orientation, contributed to more positive and negative evaluations of orgasm. For example, one woman reflected:

> I learned early on that men have no clue about female orgasms, and the ones that brag the most about being able to achieve them are the worst. They just drag it out longer. Individuals differ, some aren't prepared to learn, a few have insisted they know better than me and what I like.

When speaking about her partner's health, a woman wrote, "It [frequency of orgasm] is much less now due to my husband not being able to attain an erection, sex is almost non-existent, and I have no urge to have sex with him because he gets upset that he cannot perform." Another explained, "It's decreased [frequency] due to limited mobility of my partner." Some women also commented on differences in orgasm experience depending on the gender of their partners; for

example, "When I started going out with women (exclusively, for years), the orgasm situation improved," and "With my husband, it has changed into a comfortable, predictable, but never boring. It takes me a little longer, and I need more lubrication. With experiences with women, all orgasms have been over the top pleasurable, no matter what age." Others commented on the importance of penis size and the potential negative impact on orgasm, "Size matters! One boyfriend had a small penis, and it was a lot harder to have orgasms through intercourse with him. Thinner/narrower penises also aren't as pleasurable or as orgasm causing!"

Discussion

The present study offers the first cross-sectional analysis of SOE by menopausal status using both the ORS and BSOS, along with a qualitative exploration of post-menopausal women's orgasm experiences over adulthood. It also provides the first direct comparison of solitary and partnered orgasm experiences across adulthood. Overall, post-menopausal women reported fewer physical sensations, but orgasm intensity did not differ across groups. Notably, post-menopausal women rated solitary orgasms as more physically intense than peri-menopausal women. Pre-menopausal women described exerting the greatest effort to reach orgasm in both contexts. Across all groups, partnered orgasms were consistently rated higher than solitary orgasms in most domains.

Physical Sensations

Post-menopausal women reported fewer physical sensations, specifically including flooding sensations, general spasms, and all bodily and physiological sensations (overall bodily and physiological sensations, extragenital sensations, genital sensations and spasms, and nociceptive sensations and sweating responses). Reduced perceptions of physical sensations may reflect the physiological effects of menopause and chronological ageing on the SOE. These

findings are consistent with research linking menopause and ageing to declines in multiple domains of sexual function (Heidari et al., 2019; Mansfield et al., 2000; Monteleone et al., 2018). Hormonal changes, including reductions in estrogen, testosterone, and dehydroepiandrosterone (DHEA), are associated with decreased lubrication, reduced genital vasocongestion, diminished clitoral and vaginal sensitivity, and structural changes to hormone-sensitive tissues such as the clitoris and pelvic floor, all of which may impact physical sensations (Basaran et al., 2008; Davison et al., 2005; Dennerstein et al., 2005; Levin, 2015b; Nappi & Palacios, 2014). Pelvic floor muscle atrophy, in particular, has been linked to reduced contractility and lubrication, both essential for pleasurable orgasm sensations (Nazarpour et al., 2017, 2018). In addition, menopause-related symptoms such as hot flashes, fatigue, and body image concerns (Kalmbach et al., 2015; Mansfield et al., 2000; Smith et al., 2017), as well as higher rates of chronic illness, further contribute to declines in sexual functioning (Lee et al., 2016; Nusbaum et al., 2003). Together, these biological, physiological, and health-related changes help contextualize the reduced physical sensations in the SOE reported by post-menopausal women in this study. Qualitative data also supported these findings and align with prior research. Some post-menopausal women identified a range of health-related factors across both sexual contexts, including their own and partner's chronic health conditions, reduced lubrication, menopause, childbirth and pregnancy, diminished physical energy and ability, and increased pain, as negatively influencing the quality of orgasm over adulthood.

Taken together, these findings extend prior research on menopause and sexual function by demonstrating how progression through menopausal stages is reflected in changes to the SOE. The integration of qualitative reflections strengthens this contribution by illustrating the lived impact of factors associated with menopause and chronological ageing on the perceived quality

of orgasm across adulthood for many, but not all, women. Importantly, these results show that declines in sexual function identified in prior research are not limited to occurrence or frequency but also encompass changes in the physical sensations of the SOE.

Physical Intensity

One surprising finding was that post-menopausal women, despite reporting significantly fewer physical sensations, did not report lower intensity of orgasms and in fact, reported more physical intensity with solitary orgasm compared to peri-menopausal women. This result directly contradicts early sexuality research, which claimed that orgasms obtained after menopause are of decreased intensity (Levin, 2015b; Masters & Johnson, 1966).

Several factors may explain why no significant group differences emerged for orgasm intensity. Physical intensity may be influenced by mechanisms (e.g., expectations and distractions from pain and taste impact relative intensity ratings; (Luo et al., 2024; Mourkojannis et al., 2025; Van Der Wal & Van Dillen, 2013) distinct from those underlying sensory or bodily and physiological sensations, suggesting that intensity reflects a unique construct rather than a direct extension of those variables. This interpretation aligns with Mah and Binik's (2002) original conceptualization of intensity as an independent dimension of orgasm and is supported by more recent psychometric research (Webb et al., 2022). It is also possible that the null findings represent a statistical net-zero effect, as qualitative data revealed considerable within-group variability. Some post-menopausal women described increased intensity over adulthood, while others reported decreases. Although declines were reported more frequently, this diversity of experiences may have diluted quantitative group differences. Finally, measurement limitations may have contributed as orgasm intensity was assessed using only two single-item questions,

which may have lacked the sensitivity and specificity needed to capture subtle variations across menopausal stages.

Effort

Contrary to predictions, post-menopausal women did not report greater effort to reach orgasm in either sexual context. In fact, pre-menopausal women reported significantly more effort compared to peri- and post-menopausal women in both solitary and partnered contexts.

Peri- and post-menopausal women may benefit from greater sexual experience, self-awareness, and assertiveness, whereas pre-menopausal women may have comparatively less experience and lower assertiveness in partnered settings (Kimble et al., 1984; Rickert et al., 2000). Some younger women may also be experiencing higher body-image self-consciousness (Claudat, 2013; Dove & Wiederman, 2000). It has been suggested that 'spectatoring' (Masters & Johnson, 1966; Robbins & Reissing, 2018) during sexual activity detracts from concentration and present-moment awareness of sensations, both of which are essential for orgasm with a partner (Selice & Morris, 2022). In addition, relationship duration for younger women in this study was comparatively shorter; longer relationships may result in greater trust, ease, comfort, and mutual understanding of sexual preferences (Hinchliff & Gott, 2004) resulting in less effort experiencing orgasm.

The extent to which post-menopausal women's physical sensations are influenced by the combined effects of chronological ageing and menopause likely still contributed to some degree to the effort required to reach orgasm. Nevertheless, previous research indicates that women in this life stage often demonstrate a remarkable capacity to adapt to sexual changes by modifying practices, shifting priorities, or embracing acceptance (DeLamater et al., 2019; Thomas et al., 2018). As with all women, solitary sexual activity affords greater autonomy, allowing

individuals to tailor stimulation to their own preferences and needs (Goldey et al., 2016). This context fosters heightened attunement to bodily sensations, minimizes interpersonal distractions, and provides immediate feedback regarding pressure, rhythm, and technique (Dixon et al., 2024). Together, these adaptive abilities and the control inherent in solitary sexual activity may enable post-menopausal women to navigate or compensate for potential physiological challenges related to effort in reaching orgasm.

As in other domains, the qualitative findings revealed considerable within-group variability among post-menopausal women across both sexual contexts, regardless of whether group-level differences were observed. In both solitary and partnered contexts, women described a wide range of factors that influenced orgasm quality and likely shaped the effort required to reach orgasm. In the solitary context, some reported increased effort due to reduced desire, vaginal dryness, or pain. In contrast, others described greater ease of orgasm, citing enhanced self-knowledge, bodily comfort, and sexual confidence. In the partnered context, participants discussed challenges such as reduced libido, inadequate stimulation, physical discomfort, and a lack of partner's sexual knowledge. At the same time, others highlighted the positive influence of emotional intimacy, comfort with partner, and relationship quality, emphasizing how sociocultural and interpersonal factors intersect with the SOE and contribute to the effort involved in reaching orgasm.

Impact of the Partner on SOE

Contrary to expectation, partnered orgasms were consistently rated higher than solitary orgasms across all groups of women. Specifically, partnered orgasms involved more physical sensations and physical intensity across groups. However, some exceptions emerged within the cognitive-affective dimension, sexual context had no effect on relaxation for any group, and

pleasurable satisfaction was unaffected by partner presence among peri- and post-menopausal women.

Previous research reports are varied regarding differential experiences with solitary and partnered orgasms. Solitary orgasms have been described as qualitatively superior for women. It has been hypothesized that increased autonomy over stimulation, pacing, and contextual conditions facilitate heightened subjective satisfaction (Fahs, 2014; Goldey et al., 2016; Mah & Binik, 2002; Rowland et al., 2019). In addition, solitary pleasure has been described as primarily physically or erotically focused, whereas partnered orgasms have been associated with emotional intimacy and nurturance (Goldey et al., 2016; King et al., 2011; Mah & Binik, 2002, 2005). However, the present findings showed that women rated partnered orgasms as higher not only in cognitive-affective domains but also regarding physical sensations, intensity, and as more effortful, suggesting that the presence of a partner may amplify multiple aspects of the SOE.

Partnered orgasms engage relational and emotional processes such as emotional intimacy, mutual arousal, partner responsiveness, trust, relationship quality, performance pressure, and partner health (Byers & MacNeil, 2006; Meston & Buss, 2007). While these factors may uniquely enhance orgasm quality, they remain poorly understood. The links between relationship satisfaction, sexual satisfaction, and sexual functioning are well documented (Byers & Cohen, 2017; Byers & MacNeil, 2006; del Mar Sánchez-Fuentes et al., 2014; Lawrance & Byers, 1995; Leavitt et al., 2021, 2023; Tavares et al., 2017), but the specific role of orgasm to this reciprocal dynamic has been less clear. Orgasms described more by cognitive-affective and physical sensations appear to contribute to psychological intensity and likely influence both sexual and relational satisfaction. In turn, satisfying relationships may accentuate these aspects of orgasm. Supporting this link, SOE scores measured by the ORS have been positively associated with

sexual satisfaction (Arcos-Romero et al., 2018), reinforcing the association between SOE and broader sexual and relationship satisfaction.

Although some prior studies interpreted SOE scores in terms of intensity rather than descriptive accuracy, recent research provided converging evidence that women tend to report heightened SOE experiences in partnered contexts. For example, Muñoz-García and colleagues (2023) found that young women rated partnered orgasms higher on affective, sensory, and intimacy dimensions, though not on the rewards dimension. Similarly, Arcos-Romero and Sierra (2020), using Bronfenbrenner's (1994) Ecological Theory of Human Development, identified interpersonal factors such as partner-focused dyadic sexual desire and relationship satisfaction as among the strongest predictors of orgasm intensity in women. This research supports the findings of this study suggesting that relational factors significantly shape the quality of women's orgasm experiences.

Diversity of Experience

The effects of menopause and chronological ageing on women’s sexual functioning and satisfaction have been well documented in the quantitative literature, typically indicating negative impacts (Ambler et al., 2012; Citak et al., 2010b; Hadizadeh-Talasaz et al., 2019; Nazarpour et al., 2018). However, the findings of this study suggest that these patterns may best not be interpreted as evidence of an inevitable or uniform decline. Participants revealed both improvements (e.g., increased self-knowledge) and declines (e.g., reduced desire), sometimes within the same domain (e.g., effort). This complexity challenges assumptions of uniform decline, instead pointing to a more nuanced picture of adaptation and variability. While the ORS and BSOS provide valuable group-level insights, they may not fully capture the individualized, context-specific nature of SOE, particularly when shaped by internalized beliefs about ageing

(Fileborn et al., 2015) and variability in accumulated life and relationship experiences (Miller, 2019). By contrast, qualitative methods allowed women to articulate their experiences in their own words, offering a richer and contextualized understanding of sexual changes in later life (Thomas & Thurston, 2016). Together, these findings underscore the value of mixed-methods approaches for identifying both population-level patterns and individual variation.

Limitations

These findings should be considered in light of several limitations. First, although many effects reached statistical significance, several were associated with small effect sizes, limiting their clinical relevance. Second, the research relied on retrospective self-report, which is subject to recall bias, particularly among older participants reflecting on decades of sexual experiences (Raphael, 1987). Third, participants rated their most recent orgasm, which may not reflect their typical, or more common, experiences. Fourth, despite efforts to counterbalance the order of sexual context questioning, social desirability and context-related biases, such as the tendency to privilege partnered over solitary sex, may still have influenced participants' responses (Fahs, 2014). Finally, the cross-sectional design limits causal interpretations. Longitudinal research is necessary to gain a deeper understanding of developmental trajectories in SOE across the lifespan.

Conclusion

Women’s orgasm experiences vary considerably and are shaped by reproductive transitions, life events, and individual psychosocial development and context. Our findings indicate that while physical sensations tend to decline following menopause, cognitive-affective dimensions, intensity, and effort remain largely stable. In this study, partnered orgasms were consistently rated higher than solitary ones, highlighting the role of relational and interpersonal

dynamics in sexual experience. Collectively, these results suggest that although orgasm experiences in later life may be challenged by chronological ageing and menopause, many women adapt and continue to enjoy sexuality as a central and evolving aspect of their lives. It is therefore essential that researchers and clinicians acknowledge these individual trajectories and work toward more inclusive understandings of later-life sexuality, thereby equipping themselves to better support women in sustaining the sexual lives they desire well into older age.

General Discussion

"Sex is like a fine wine. It gets better with age if you store it properly." Grace & Frankie

As women age, they often find themselves navigating uncharted waters when it comes to their sexuality. While this topic has historically been considered taboo or uncomfortable to discuss openly, recent years have seen a growing recognition of the importance of addressing older women's sexual health and well-being. For example, the popular television show Grace and Frankie has emerged as a groundbreaking and entertaining platform that sheds light on this often-overlooked aspect of ageing (Kauffman & Morris, 2015–2022). Producer Marta Kauffman's mission, to give a voice to actresses in their 70s who are "tired of playing the grandmother", has resulted in a series that tackles sexuality in later life with both humour, depth, and optimistic enthusiasm. The show's frank discussions about sexual topics, like orgasm, challenge societal dismissal of older women as sexual beings (Westwood, 2023). By featuring characters who start a business selling vibrators specifically designed for older women, a concept now being supported by some healthcare professionals for vaginal health (Collar et al., 2022; Dubinskaya et al., 2024), *Grace and Frankie* opens up meaningful conversations about sexual wellness in ageing. This candid approach not only resonates with older viewers but feeds the curiosity of younger women who want to know what to expect as they age.

Unfortunately, this TV program is the exception to the rule in our society, such that we have disproportionately focused on men's orgasms and sexual pleasure, regardless of age (Mintz, 2017). Media representations, such as in television and film, often reinforce this disparity by portraying male pleasure as central and normative, while female pleasure may be depicted less frequently, responsive to male pleasure, or the depictions are simply inaccurate (Helgevold, 2023; Mahar et al., 2020; Mintz, 2017). Society often prioritizes male sexual pleasure and

orgasm experiences, with women's experiences frequently compared to those of men as the 'standard' (Mahar et al., 2020; Mintz, 2017). In the context of this dissertation, I purposely avoided the comparison of women's research to that of men's, asserting that women's research can and should exist for its own sake. This approach challenges the conventional narrative and emphasizes the importance of studying women's experiences independently, without the need for comparison to men's experiences as a benchmark.

This dissertation addresses critical gaps in sexual health research and clinical practice by focusing on women across the lifespan. Older women represent one of several underrepresented groups (e.g., BIPOC, LGBTQIA2S+) in research, highlighting significant inequalities of representation (Watson-Singleton et al., 2023). These research patterns mirror broader societal challenges where older women face intersectional discrimination based on both age and gender, termed "sexagism" (Bouson, 2016; Westwood, 2023). Such research disparities significantly impact the quality of clinical care women receive, manifesting in such problems as infantilization and dismissal of symptoms as "a normal part of ageing" (Chrisler et al., 2016).

Traditional medical and societal perspectives have often presented an overly simplistic view of the relationship between ageing and sexuality, frequently minimizing or overlooking women’s sexual experiences (Kuhle et al., 2021). Contemporary researchers highlighted that this relationship is nuanced and varies considerably among individuals (Bell, 2016; Fileborn et al., 2015; Hinchliff & Gott, 2008; Thomas & Thurston, 2016). However, research on sexual response in older women, particularly in relation to orgasm, remains limited.

Masters and Johnson (1966) first emphasized the wide variability in women’s orgasm experiences, describing them as “a potpourri of psychophysiological conditions and social influence” (p. 133). Building on this foundation, Mah and Binik (2002) conceptualized the

subjective orgasm experience (SOE) in terms of cognitive-affective and sensory dimensions, and Dubray and colleagues (2017) further expanded this model to include bodily and physiological sensations. Despite these theoretical advances, most empirical research has focused on pre-menopausal women, leaving peri- and post-menopausal experiences underexamined. The combined influence of lived experiences, ageing and menopause introduces complex biopsychosocial factors that may shape orgasm in later life, yet its progression across adulthood remains insufficiently understood.

The overarching purpose of this dissertation was to examine whether the SOE changes for women across adulthood. In this general discussion, I first summarized the key findings from Studies 1 and 2. I then considered their implications for clinical practice, sexuality research, theoretical models, and broader societal understanding, while highlighting key directions for future research. Finally, I addressed the limitations of both studies and present the main takeaways from this research.

Study 1 Summary

Very little is known about the psychological perception, sensation, and evaluation of orgasm, especially for peri- and post-menopausal women. Prior to this research, no empirically validated measures were available to assess older women's subjective experiences of orgasm. This lack of appropriate measurement tools significantly hindered research in this area. The aim of Study 1 was to evaluate the Orgasm Rating Scale (ORS) and Bodily Sensations of Orgasm Scale (BSOS) for use with pre-, peri-, and post-menopausal women and between solitary and partnered orgasm contexts.

For the ORS, a 10-factor solution (nested within overall cognitive-affective and sensory dimensions) was preferred for each of the three participant groups (pre-, peri-, post-menopausal

women) and in both sexual contexts (solitary, partnered). The ten factors included pleasurable satisfaction, ecstasy, emotional intimacy, relaxation, building sensations, flooding sensations, flushing sensations, shooting sensations, throbbing sensations, and general spasms. For the BSOS, 3-factor solutions were preferred for each of the three groups of women and within both sexual contexts. The 3-factors included extragenital sensations, genital sensations and spasms, nociceptive sensations and sweating responses. Configural, metric (e.g., except for partial metric invariance for solitary BSOS), and scalar invariance for the solitary and partnered versions of the ORS and BSOS were found, suggesting the measures were interpreted similarly by all women.

These validated tools can now be reliably used to learn more about women's orgasm experiences and ultimately be helpful in clinical contexts for women having challenges experiencing orgasm, who find the experience unsatisfactory, or who are interested in optimizing pleasure. These results demonstrated that the ORS and BSOS are supported for use with women across adulthood in solitary and partnered orgasm contexts.

Study 2 Summary

For Study 2, the newly validated measures of SOE were used to provide the first comprehensive assessment of orgasm experience over adulthood. Study 2 had two general aims. First, to investigate women's orgasm experiences over the adult lifespan by comparing pre-, peri-, and post-menopausal women. Second, to determine whether sexual context (e.g., solitary, partnered) impacted orgasm experience. Additionally, a qualitative inquiry was included to explore how post-menopausal women specifically describe their experiences with orgasm over adulthood.

The SOE differed by menopausal status across both sexual contexts. Overall, post-menopausal women reported fewer physical sensations, although, contrary to predictions,

orgasm intensity did not differ significantly across groups. Interestingly, post-menopausal women rated their solitary orgasms as more physically intense than peri-menopausal women. Pre-menopausal women reported exerting the most effort to reach orgasm in both solitary and partnered contexts, while cognitive-affective sensations remained consistent across menopausal stages.

The SOE differed significantly between solitary and partnered orgasms across all menopausal groups. Partnered orgasms were rated higher than solitary orgasms for all women, though the specific dimensions varied slightly by menopausal status. Pre-menopausal women reported partnered orgasms as higher across nearly all domains, including cognitive-affective sensations (emotional intimacy, ecstasy, pleasurable satisfaction), physical sensations (sensory, flooding, flushing, and general spasms; bodily and physiological; extragenital; genital and spasms; and nociceptive sensations and sweating responses), as well as physical and psychological intensity and effort. Peri-menopausal women showed a similar pattern, rating partnered orgasms higher in cognitive-affective sensations (emotional intimacy, ecstasy), physical sensations (throbbing, bodily and physiological, extragenital, genital and spasms, nociceptive and sweating responses), and physical and psychological intensity and effort. Likewise, post-menopausal women rated partnered orgasms as involving greater cognitive-affective sensations, emotional intimacy, and ecstasy, as well as more bodily and physiological, extragenital, genital and spasms, nociceptive and sweating sensations, along with higher psychological intensity and effort. Notably, the magnitude of sexual context differences did not vary across menopausal groups.

When post-menopausal women were asked to reflect on how the quality of their orgasm had changed over adulthood, they reported a large degree of variability of experiences. In the

solitary context, post-menopausal women most frequently endorsed items in categories of effort, intensity, and self-knowledge, and categories specific to solitary orgasm categories were functional use and sex guilt. In the partnered context, the most mentioned categories were effort, intensity, and self-efficacy, and categories that were specific to partner orgasm included relationship (e.g., emotional intimacy, relationship quality) and partner-specific (e.g., partners' knowledge, availability, characteristics, health, teachability, penis size, and sexual orientation) factors. Many women also reported that they noticed no changes in the quality of their orgasm over adulthood in either context.

Although some between-group differences were found, general overall statements cannot be made about older women's experiences with sexuality, especially in the context of orgasm. The qualitative responses in this study provided invaluable insights, expanding quantitative findings by highlighting important within-group differences. The qualitative data reflected a mixed picture of experiences of orgasm: no change, increasing or improving aspects, or decreasing or worsening aspects.

Study 2 highlighted the importance of comprehensively assessing orgasm experiences in women, especially post-menopausal women. Given that there is no one-size-fits-all definition of sexuality, clinically, it will be necessary for clinicians to ask both quantitative and qualitative questions to capture the diversity of experiences. Additionally, given the variability, the definition of a "normative" orgasm should be reconsidered. Instead, female orgasm may be more appropriately understood along a continuum, with diverse experiences not necessarily requiring pathologizing.

Clinical Implications

The findings of this dissertation highlight important implications for how women's SOE is assessed and understood in clinical practice. First, the results contribute to the empirical foundation of the DSM-5 diagnostic criteria for Female Orgasmic Disorder (American Psychiatric Association, 2013), while also raising questions about the manual's limited consideration of age-related changes and the centrality of distress. Second, the findings underscore the critical influence of partner and relational dynamics on SOE and the need for these factors to be central to assessment. Together, these insights emphasize the importance of diagnostic and clinical frameworks that avoid overpathologizing normative variation, incorporate age-appropriate expectations, and give thorough attention to partner-related factors when evaluating women's sexual concerns regarding orgasm.

DSM-V Female Orgasmic Disorder

The findings contribute to the empirical evidence base for the diagnostic criteria for Female Orgasmic Disorder outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013); specifically, the criteria describing "a marked reduced intensity of orgasmic sensations". The research findings outlined in this dissertation clearly highlight that in women across adulthood and especially in later years, SOE can vary significantly. These variations underscore the complexity and diversity of sexual experience across the lifespan. The now validated, across menopausal status and sexual context, measures can assist clinicians and researchers to move beyond anecdotal accounts to more formal and comprehensive assessments capturing nuance and clarifying experiences of 'reduced sensations' or unsatisfying orgasm experiences.

While these findings reinforce the DSM-5 description of 'reduced sensations' as part of Female Orgasmic Disorder (American Psychiatric Association, 2013), they also raise important questions about how age-related changes in sexual response intersect with the nosology's broader exclusionary criteria and its limited attention to ageing. Exclusionary criteria include symptoms that are better explained by a non-sexual mental disorder, severe relationship distress, significant life stressors, substance/medication effects, or other medical conditions. There are no specific age-related parameters mentioned in the core diagnostic criteria. Although, at the beginning of the Sexual Dysfunctions chapter, there is a general statement that "ageing may be associated with a normative decrease in sexual response." This statement appears to broadly apply to all sexual dysfunctions discussed in the chapter (American Psychiatric Association, 2013).

The findings of this dissertation provide empirical support for ageing-related changes in the physical sensations of orgasm by menopausal status, while also highlighting no age-related declines in orgasm intensity. In fact, post-menopausal women reported greater physical intensity during solitary orgasms compared to peri-menopausal women. These findings challenge the DSM-5's general assertion of a "normative decrease" in sexual response with age in the very least regarding orgasm, suggesting instead that orgasm intensity may be maintained, or even heightened, in later adulthood.

In the applied context, it is essential to distinguish between what the data of this research suggest are normative age-related changes in orgasmic response and what may be considered a diagnosis of a sexual dysfunction according to DSM-5 criteria. These criteria further necessitate the presence of personal or interpersonal distress (American Psychiatric Association, 2013). Researchers have clarified that some individuals may have a compromised sexual response but do not experience distress about their functioning (Bancroft et al., 2003; DeLamater et al., 2019;

Thomas et al., 2018). In fact, a substantial body of research shows that only a subset of women who report orgasm difficulties also report distress about those difficulties (Graham, 2010; King et al., 2007; Oberg et al., 2004; Shifren et al., 2008; Witting et al., 2008). For instance, Graham (2010; DSM-5 Female Orgasmic Disorder) and King and colleagues (2007; ICD-10 Lack or Loss of Sexual Desire, Sexual Arousal Disorder, Orgasmic Dysfunction, Non-organic Vaginismus, Non-organic Dyspareunia) mentioned that many women who met diagnostic criteria for sexual dysfunction did not report distress, challenging the validity of symptom-based thresholds. Orgasm, while often culturally emphasized as the *orgasm imperative* (i.e., attaining orgasm as part of a valid sexual experience; Séguin & Blais, 2021), may not be a consistent predictor of sexual distress, and its absence may not necessarily imply a clinical problem. The value placed on experiencing orgasm varies widely; for some women it is central, while for others orgasm plays a minimal role (Bancroft, 2009). Brotto (2010) emphasized, these experiences (e.g., absence of orgasm, low sexual desire) warrant attention only when they cause distress or interfere with a woman's well-being or relationships; otherwise, they may simply reflect normative variability.

There is currently no evidence whether a decline in physical sensations is accompanied by clinically significant distress among older women. The presence of orgasm-related symptoms or lower scores on measures such as the ORS and BSOS, should not be assumed to indicate dysfunction without also assessing for associated distress. Further, rigid, medicalized definitions of sexual function risk pathologizing natural variation, especially among older women. General diagnostic tools often assume that any deviation from a youthful or heteronormative sexual script indicates dysfunction, even in the absence of distress or impairment (Sinković & Towler, 2019). Many older women adapt to changes in sexuality by adjusting their sexual practices, redefining

their priorities, and cultivating greater acceptance of their changing experiences (DeLamater et al., 2019; Thomas et al., 2018).

For instance, older women increasingly value non-intercourse sexual activities, such as kissing, caressing, and emotional intimacy (Gore-Gorszewska & Ševčíková, 2023), which could shape how they experience and prioritize orgasm. Researchers suggested that women often revised their sexual scripts with age, emphasizing sensuality and relational connection over performance-based goals like orgasm (DeLamater & Koepsel, 2015). As a result, orgasm may remain desirable but may become less central to sexual satisfaction. Even among younger-to-middle aged women, orgasm did not appear among the top reasons for having sex (Meston & Buss, 2007). Qualitative research affirmed that emotional closeness and non-penetrative touch are central to older women's sexual satisfaction (Fileborn et al., 2015; Hinchliff & Gott, 2004). Additionally, sexual motivations in later life tended to be primarily personal (e.g., to feel young, attractive, or desirable) and interpersonal (e.g., to enhance intimacy or a partner's pleasure), with few avoidance-based motives, suggesting greater authenticity and self-focus in older women's sexual decision-making (Gewirtz-Meydan & Ayalon, 2019). Similarly, large-scale survey data indicated that many older women reported high sexual satisfaction despite lower intercourse frequency, often prioritizing closeness and mutual pleasure over orgasmic outcomes (Lindau et al., 2007).

These optimistic research findings do not imply that all older women are free from sexuality or orgasm related distress. Future research should therefore examine not only the presence of orgasm-specific changes but also the level of personal and/or interpersonal distress this may cause. In both, the research and applied context, it would be imperative to examine

which factors distinguish older women who adapt to changes associated with aging and menopause from those who struggle.

Recognizing these complexities also highlights the importance of how such concerns are addressed in clinical practice, particularly given the barriers many women face in initiating conversations about sexual health. Clinically it is important to acknowledge that women often hesitate to raise sexual health concerns, while many providers feel underprepared to address them (Faubion & Parish, 2017; Kingsberg et al., 2019; Lindsay, 2021; Reissing & Giulio, 2010). Although most women are open to discussing sexual function, they frequently wait for providers to initiate the conversation (Meystre-Agustoni et al., 2011) leaving concerns unaddressed. This underscores the need for clinicians to take a proactive, client-centered approach that validates women's experiences and creates space for open dialogue (Hinchliff et al., 2010; Lindsay, 2021; Winterich, 2003). Central to these discussions is rejecting the assumption that sexual problems are an inevitable part of ageing, as the "inevitable decline" narrative normalizes dysfunction, discourages help-seeking, and diminishes quality of life (Sinković & Towler, 2019).

These clinical realities reinforce the need for diagnostic frameworks that neither overpathologize age-related changes nor overlook the diversity of women's sexual experiences in later life. Until more evidence clarifies the role of distress in this population, assessments should avoid pathologizing what may be normal variability. Future diagnostic frameworks, including revisions of the DSM, should incorporate age-appropriate expectations while recognizing the considerable individual variation among older women's sexual experiences.

Impacts and Influence of the Sexual Partner

This dissertation highlights the significant role of the sexual partner in shaping women's SOE and demonstrated why partner-related factors should be central to clinical assessment.

While previous research described solitary orgasms as preferred due to apparent greater reliability and consistency (Dekker & Schmidt, 2003; Fischer et al., 2021), the findings of this dissertation showed that partnered orgasms were consistently rated higher across most domains, despite requiring more effort. The results of the content analysis further underscored the significant role of the partner, with post-menopausal women frequently emphasizing partner-related factors such as a partner's ability to take sexual direction ("teachability") and partner health, alongside relationship-related factors such as emotional intimacy and overall relationship quality, as key influences on orgasm quality.

Among post-menopausal women, physical intensity and pleasurable satisfaction did not differ between partnered and solitary contexts, possibly reflecting the overall decrease in physical sensations reported by this group. Although relational factors can enhance sexual experiences, they may not fully counteract the physiological changes associated with ageing and menopause, underscoring that orgasm is shaped by both biological and relational influences. This pattern may explain at least part of the shift in later life, with older women often prioritizing sensuality, closeness, and mutual pleasure over orgasm as a central goal (DeLamater & Koepsel, 2015; Fileborn, et al., 2015; Hinchliff & Gott, 2004; Lindau et al., 2007; Meston & Buss, 2007). These age-related differences highlight the need for assessment approaches that attend to the relational and contextual aspects of orgasm, particularly in older women, and identify an important direction for future research.

The importance of the sexual partner in shaping SOE is also reinforced by earlier research. Mah and Binik (2001) suggested that relationship factors may be more predictive of women's sexual distress than the frequency or intensity of orgasm. Orgasm has also been found to correlate more strongly with relationship satisfaction than with sexual satisfaction,

underscoring its context-dependent meaning (Christopher & Sprecher, 2000; Mah & Binik, 2001; Sprecher & Cate, 2004). Relational compatibility, as one example of a partner-and-relationship factor, is central, with women citing too little foreplay and imbalanced sexual interest as key sources of dissatisfaction (Witting et al., 2008). Building on this evidence, both clinical assessment and future research should investigate partner- and relationship-related factors as primary predictors of SOE, clarifying how these dynamics operate across different stages of adulthood and ensuring that interventions address not only address individual concerns but also concerns within the relationship.

Research and Theoretical Implications

This dissertation advances research and theory in sexuality by offering a deeper, more nuanced understanding of women's sexual experiences. The results of Study 2 expand the Multidimensional Model of the Subjective Orgasm Experience (MMSOE) to include a broader range of sensations, perceptions, and influences; Study 1 validated the use of the ORS and BSOS across menopausal stages in both solitary and partnered contexts; and demonstrated the value of integrating qualitative and quantitative methods to fully capture the diversity of the SOE. Underlying these findings is the recognition that menopausal status provides a contextually relevant framework for exploring sexuality across adulthood.

Expanded Multidimensional Model of the Subjective Orgasm Experience (MMSOE)

This dissertation advances theories of orgasm and sexuality by proposing an expansion to the MMSOE (see Figure 1). Earlier models, such as Mah and Binik's (2002) two-dimensional cognitive-affective and sensory framework and the Spanish ORS revision identifying affective, sensory, intimacy, and rewards dimensions (Arcos-Romero et al., 2018), offered valuable insights but did not fully capture a comprehensive range of sensations, perceptions, and

influences on women's SOE. Further, variables assessed under the BSOS have yet to be incorporated into the conceptual model.

Drawing on the collective findings of this dissertation, the expanded MMSOE integrates cognitive-affective sensations, sensory sensations, bodily and physiological sensations, physical intensity, psychological intensity, and effort within a biopsychosocial framework. Several specific changes to the MMSOE are suggested. First, by incorporating biopsychosocial factors, effort, and intensities into the model, this expanded framework acknowledges their influence across all components of the SOE. Second, findings from Study 1 supported a preferred three-factor solution for the BSOS, resulting in the combination of the third (nociceptive sensations) and fourth (sweating responses) domains originally identified by Dubray and colleagues (2017) under the broader category of bodily and physiological sensations.

Building on this restructuring, the third proposed change involved the consolidation of the sensory sensations dimension of the ORS with the bodily and physiological sensations domain of the BSOS under the broader label physical sensations. While the ORS primarily captured global sensory perceptions of physiological responses (e.g., throbbing sensations), the BSOS assessed more specific manifestations across body systems (e.g., heart beating faster, clitoral pulsation). These domains are conceptually related, yet complementary, and integration could provide a more comprehensive representation of orgasm-related bodily experiences. Further analyses are required to determine whether incremental validity exists between the two measures and whether sensory sensations and bodily and physiological sensations function effectively as a single construct (physical sensations) before permanent integration.

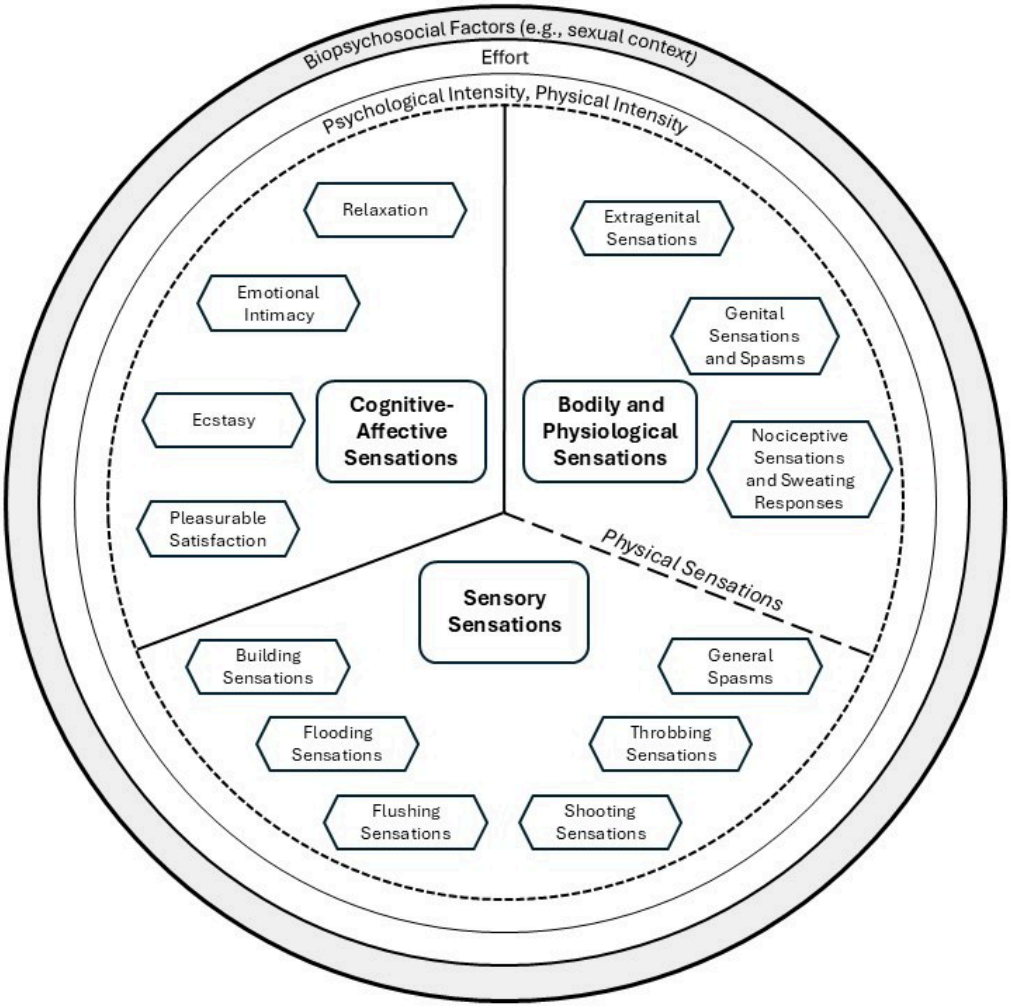
The fourth proposed change identified intensity (psychological and physical) as an independent domain of the MMSOE. The findings from Study 2 provide support for this

distinction. Physical intensity did not align with physical sensations, nor did psychological intensity align with cognitive-affective sensations. If the ORS and BSOS functioned as an index of orgasm intensity, these domains would be expected to act similarly. Their discrepancy instead reinforces Mah and Binik's (2002) original conceptualization of the ORS as capturing qualitative features of orgasm rather than magnitude. Consistent with this interpretation, higher ORS and BSOS scores should not be understood as reflecting greater intensity. Rather, orgasm intensity appears to represent a distinct construct, warranting independent assessment. Future research should directly examine whether participants are interpreting the instructions of the ORS and BSOS in terms of "intensity" or how well each adjective described the orgasm experience. Conceptual disagreement remains in the literature, particularly with the ORS, about the intended meaning of these measures. Understanding participants' interpretations would provide important context for researchers and improve the accuracy of interpreting findings derived from these instruments.

This expanded MMSOE responds to calls for multidimensional, inclusive, and lifespan-aware models in sexual health research which are grounded in a biopsychosocial theoretical framework (Brotto et al., 2017; Meston, 1997). The MMSOE offers a stronger theoretical foundation by accounting for diversity and context-dependence in women's orgasm experiences, emphasizing the interplay between physiological, psychological, relational, and lifespan influences. These refinements also have practical implications for clinical assessment and intervention, providing a framework that can guide more nuanced and comprehensive evaluation, tailored treatment strategies, and clearer, more productive conversations with women across diverse life stages and contexts.

Figure 1

Expanded Multidimensional Model of the Subjective Orgasm Experience (MMSOE)



Note. This conceptual model, adapted from the *Chronology of Pain Syndrome Progression* "snowball" model used in mindfulness-based cognitive therapy (MCBT) for provoked vestibulodynia (Basson & Brotto, 2009; Brotto et al., 2015), illustrates the cognitive-affective, sensory, and bodily and physiological sensations and intensities that shape the SOE. It highlights layers of effort and broader biopsychosocial factors, which can change, accumulate, and grow over time and across individuals and contexts, influencing how orgasm is perceived and experienced.

Integration of Mixed-Method Approaches in Research and Clinical Assessments

This dissertation contributes to sexuality research, and by extension clinical practice, by introducing newly validated tools to assess SOE in women across adulthood and in both solitary and partnered contexts. The ORS and BSOS provide a psychometrically sound means of measuring SOE among pre-, peri-, and post-menopausal women. Importantly, multi-group measurement invariance testing demonstrated that women interpret these measures consistently across menopausal stages, enabling researchers to compare experiences across age groups and sexual contexts with greater confidence.

This validation addressed a longstanding gap in the field of women's sexuality and health research: the absence of standardized empirical measures that reflect the diversity and complexity of women's orgasm experiences, particularly in later life. While the ORS and BSOS together offer a broad and nuanced view of orgasm dimensions, results from the content analysis of post-menopausal women's narratives suggested that these measures alone may not fully capture the richness of women's experiences. Quantitative, cross-sectional methods remain essential for identifying patterns, testing hypotheses, and generating generalizable findings (Guest et al., 2014a; Tabachnick & Fidell, 1996). However, a more complete approach integrates qualitative methods to explore the biological, psychological, and social influences shaping the specific SOE of a women across the lifespan.

Guided by Charlton's (1998) call for "nothing about us without us," a principle originating in disability rights advocacy, qualitative research ensures that women's voices remain central in the study of sexuality, enabling their lived experiences to shape the interpretation of findings, and the design of interventions. Qualitative data from post-menopausal participants in this study revealed substantial variability in perceived changes to orgasm quality, ranging from

no change, to improvement, to decline, that were not visible in aggregated quantitative data. Qualitative methods are critical in revealing subjective meaning, variation, and complexity that structured scales may not capture (Braun & Clarke, 2006). From a clinical perspective, assessing women's sexual function requires tools that address both measurable outcomes and personal meaning. Relying solely on single-method approaches, particularly those using non-validated instruments, risks producing inflated estimates of dysfunction (Graham, 2014; Hayes et al., 2008). For example, Lindal and Stefansson (1993) reported an anorgasmia prevalence of only 3.5% when using structured psychiatric interviews, in stark contrast to much higher rates from unidimensional, non-validated surveys (e.g., 35% in Osborn et al., 1988).

A mixed-methods approach, grounded in pragmatism (i.e., prioritizing practical solutions and outcome utility over rigid methodological boundaries; Creswell & Clark, 2017), offers the most comprehensive understanding of women's sexual function (O'Cathain et al., 2007; Wasti et al., 2022). This approach avoids overpathologizing natural variation and ensures that clinical interpretations are informed by both metrics and meaning. Clinically, integrating validated instruments with open-ended, affirming questions aligns with frameworks such as the PLISSIT model (Permission, Limited Information, Specific Suggestions, Intensive Therapy), a commonly used approach for addressing sexuality and sexual concerns (Annon, 1976), and fosters a safe, person-centered environment for clients to articulate their sexual experiences and perceived changes. Mixed-methods assessment therefore honors the complexity of female sexual health and supports more nuanced, individualized care (Forsythe et al., 2019), aligning with best-practice recommendations for health outcomes research (Regnault et al., 2017).

Future work should build on exploratory qualitative component of this dissertation by conducting rigorous thematic analyses of post-menopausal women's narratives. Data collection

could employ interviews and focus groups to generate rich, in-depth insights into women's lived experiences and the meanings they attribute, helping to contextualize quantitative findings and explore emerging concepts (Dicicco-Bloom & Crabtree, 2006; Kallio et al., 2016). Such methods would also enable follow-up questions to clarify nuance and meaning. Questions might probe changes in orgasm quality across adulthood, factors influencing those changes, the role of partners, the possible reciprocity between relationship satisfaction, sexual satisfaction, the SOE, and women's perspectives on what supports necessary for satisfying SOE. Integrating qualitative insights with quantitative results will allow for a fuller understanding of both shared patterns and individual diversity.

Measurement of Orgasm Intensity. To advance the multidimensional assessment of orgasm in both clinical and research contexts, the results of this dissertation support the inclusion of a brief, targeted measure specifically designed to assess orgasm intensity (physical and psychological). Contrary to expectations, there were generally no group differences in orgasm intensity. The one exception was that post-menopausal women rated their solitary orgasms as more physically intense than those of peri-menopausal women, a surprising finding given that post-menopausal women reported fewer physical sensations overall. One plausible explanation may lie in measurement limitations, as the present study relied on a single-item question that may have lacked the sensitivity to capture subtle or nuanced variations (Cuvillier et al., 2021). Future research should prioritize developing or adopting a valid, reliable measure of orgasm intensity that can be integrated into broader assessments of SOE. Given orgasm intensity's strong association with pleasurable satisfaction (Mah & Binik, 2005), a dimension consistently identified by women across adulthood as the most meaningful aspect of their orgasms (Webb et al., 2022), such validated measures would meaningfully advance research in this area.

Evaluating by Menopausal Status in Sexuality Research

The findings of this dissertation support the use of menopausal status as an independent variable in sexuality research with women of all ages, but especially older women. While age has traditionally been used to classify participants, research showed it is an inconsistent predictor of sexual well-being (Arenella & Steffen, 2022). In contrast, menopausal status offers a more biologically and contextually meaningful framework for understanding women's sexual experiences in later life and accounts for the variability in the age of onset of peri- or post-menopause. Formally classifying women as pre- (reproductive), peri-, or post-menopausal provides more nuanced insights than relying solely on age-based categories. Age or binary classifications risk oversimplifying the complexity and diversity of women's experiences and may obscure important patterns related to physical health, mental health, and quality of life (Newhart, 2013).

This dissertation added to this body of evidence by showing that menopausal status groups differed in their SOE, suggesting that other aspects of sexuality across the lifespan may also vary meaningfully by menopausal status. Similar patterns have been identified in prior research. For example, Dennerstein and colleagues (2002) demonstrated that hormonal changes across menopausal stages significantly influenced aspects of women's sexuality, such as sexual desire and satisfaction. Avis and co-authors (2009) found that menopausal status more accurately predicted declines in desire and lubrication than chronological age. Kingsberg (2002) further reported that sexual concerns varied across menopausal stages, emphasizing sexuality as a biopsychosocial experience, warranting individualized assessments in both research and clinical contexts. Bell and colleagues (2017) explained that partner-related factors, such as a partner's health and interest in sex, were more strongly associated with sexual activity in older adulthood

than age. Taken together, these findings emphasize the importance of incorporating menopausal status, either in place of or alongside age, when studying women's sexual health.

Recognizing the value of menopausal status as a meaningful classification variable also underscores the importance of ensuring that the tools used to assess women's sexual health are valid and reliable across diverse populations. Building on the validation of these measures across adulthood by menopausal status, future research should be designed to extend testing to underrepresented groups in sexuality research, including women meeting criteria for sexual dysfunction; those with psychological conditions; and individuals across diverse sexual orientations, gender identities, ethnicities, and languages. Expanding validation to these groups will both address their specific healthcare needs and deepen understanding of sexual diversity, while ensuring that measures are inclusive and clinically relevant. In doing so, future research can advance both scientific rigor and equitable, person-centered care in the assessment of women's sexual health.

Societal Implications

Older women's sexuality continues to be marginalized by intersecting forces of ageism, sexism, and erotophobia. These forces reinforce stereotypes of older women as asexual, invisible, and plagued with dysfunction, both by limiting their representation in media and by shaping internalized beliefs that undermine their sense of sexual value and entitlement to pleasure (Berger, 2017; Doll, 2012; Lester et al., 2016; Schover & Jensen, 1988). Although cultural products such as *Grace and Frankie* (Kauffman & Morris, 2015) provide rare exceptions by portraying older women as sexually active and self-determining, these examples highlight the urgency of creating cultural spaces where later-life sexuality is both visible and validated (Priede & Reissing, 2024). Within clinical contexts, these same biases are particularly problematic

because they can lead providers to unconsciously adopt deficit-based models of ageing and sexuality that minimize or pathologize women's concerns (Hinchliff et al., 2010). Approaches to menopause have often reflected these assumptions, framing it through a disease model that emphasizes decline, dysfunction, and loss (Hunter, 2015). These deficit-based narratives, rooted in heteronormative, youth-centric, and male-centric assumptions, obscure the diversity of older women's sexual realities and dismiss ageing-related changes (Gewirtz-Meydan et al., 2018; Villar & Vasconcelos, 2025).

The findings of this dissertation contradict such portrayals by offering a more hopeful and nuanced account of sexuality in later life. Although some declines were observed in domains of the SOE, such as physical sensations, the evidence clearly showed that inevitable decline does not capture the full story of women's orgasmic experiences. Many post-menopausal women reported improvements in the quality of their orgasms over adulthood, including greater self-knowledge, self-efficacy, and intimacy. Physical intensity was even reported as higher for post-menopausal women in solitary contexts compared to peri-menopausal women. These findings directly challenge societal narratives that depict older women as asexual and dysfunctional. Instead, they underscore that women's sexual experiences are diverse, dynamic, and can be positively transformed in later life. In this way, the findings in this dissertation advance feminist and gerontological perspectives that reject male-centered frameworks of sexuality (Hooyman et al., 2002).

Historically, women's orgasms have been undervalued and framed as optional compared to men's (Gallup et al., 2018), while internalized shame and gendered scripts have constrained women's exploration of pleasure (Adam et al., 2020). By focusing on women's experiences on their own terms, this research resisted comparison to men's sexuality and affirmed the legitimacy

and normative diversity of women's SOE across adulthood. This research also underscored emerging evidence that some groups, such as older lesbian women, report greater orgasm frequency and satisfaction, suggesting that self-knowledge and autonomy can strengthen sexual well-being in later life (Gesselman et al., 2024).

The dissertation results further support a reframing of menopause and ageing away from deficit-based models toward perspectives grounded in pleasure, transformation, and empowerment. Menopause has often been constructed as a pathological condition within medicine, reinforcing sex-negative expectations and discouraging women from seeing sexuality as relevant in later life (Bancroft, 2002; Kırlı & Kaya, 2025; Voicu, 2018). Yet many women experience this transition as liberating, describing increased body acceptance, comfort with sexual identity, and freedom from reproductive concerns (Goldey et al., 2016; Sandberg, 2013). Research confirmed that menopause often prompts women to view sex as oriented toward pleasure and intimacy rather than reproduction (Dillaway, 2012; Gott & Hinchliff, 2003; Miller, 2019). Similarly, the concept of "affirmative old age" challenges anti-ageing ideals by affirming the legitimacy of a wide range of experiences, from vibrant sexuality to indifference, while positioning ageing bodies as worthy and valuable (Sandberg, 2013). These perspectives are political and empowering, countering cultural scripts that reduce older womanhood with desexualization and invisibility (Chrisler et al., 2016).

From a clinical standpoint, these findings point to the importance of maintaining an affirmative, strengths-based, and equity-focused approach. Rather than centering on dysfunction, clinicians may serve their clients better by recognizing and enhancing the resilience and adaptability with which women navigate changes in sexual function. A "good-enough" model of sexuality emphasizes satisfaction, intimacy, and flexibility, reframing sexual health beyond

orgasm as the singular goal (Metz & McCarthy, 2007; Opperman et al., 2014). Such models validate a wide spectrum of sexual expressions, from intercourse to non-coital touch, companionship, and emotional intimacy, all of which may be particularly meaningful in later life (Bell et al., 2017). Supporting sex-positive environments in clinical and long-term care settings is essential for affirming women's agency and counteracting the harm of narratives that render women invisible (Fennell & Grant, 2019; Lester et al., 2016; Priede & Reissing, 2024).

Sexual growth and transformation can take place over the course of a woman's life and early education and empowerment are critical. Current sex education remains risk-focused, omitting essential topics such as pleasure, the clitoris, and ageing. In one study, only about 10% of women can accurately identify their own genital anatomy (Jones, 2023), and the clitoris, despite being central to orgasm, remains widely misunderstood (Blechner, 2017; O'Connell et al., 2005). Lifelong learning frameworks are needed to provide younger women with knowledge about ageing and orgasm, and to support older women in enhancing their current experiences. Education should prioritize self-knowledge as a foundation for pleasure, correct persistent misinformation, and recognize pleasure as a fundamental human right (Ford et al., 2021; Mark et al., 2021). This dissertation contributes to reducing stigma and shame surrounding pleasure and masturbation by demonstrating it as a valid and effective means of experiencing pleasure, particularly for post-menopausal women, supporting solitary sexual expression as an autonomous and meaningful aspect of sexual well-being.

Without language or frameworks to describe pleasure, women risk exclusion from clinical and research conversations (Jones, 2019). Just as *Grace and Frankie* sparked rare intergenerational conversations about sexuality in later life (Kauffman & Morris, 2015), educational systems must take on this role more systematically to ensure that women of all ages

are equipped to navigate and celebrate their sexual lives. In doing so, this dissertation underscores that older women's sexuality is not defined by inevitable decline but by resilience, transformation, and the enduring potential for pleasure and intimacy, affirming sexual well-being as a vital part of women's lives across the lifespan.

Limitations

Several limitations should be considered when interpreting the findings of this dissertation. From a methodological perspective, menopausal status classification presented challenges. Assigning participants on continuous birth control into menopausal status groups required approximation, as certain contraceptives (e.g., hormonal IUDs, oral contraceptives) can alter menstrual cycle frequency and sexual function (Saadedine & Faubion, 2024). Because the STRAW Staging System in large part relies on menstrual cycle frequency for classification (Soules et al., 2001), contraceptive use may complicate staging and obscure typical menopausal transition symptoms, making it difficult for participants to recall their last "natural" period or accurately assess menopausal symptom patterns.

Finally, analyses for Study 1 and Study 2 were conducted with the same sample. Generalizability is limited to this specific cohort of women, restricting broader population inferences (Shadish et al., 2002). The absence of an independent replication sample means that observed patterns may reflect characteristics unique to this group only. Future research should evaluate whether these findings hold across more diverse and independent samples to strengthen external validity (Shadish et al., 2002).

Several potential sources of bias may have influenced the findings. Social desirability bias may have led participants to present themselves in a socially acceptable manner, particularly given the sensitive nature of sexuality-related self-report measures, which are vulnerable to

impression management, retrospective distortions, memory errors, and self-deceptive enhancement (King, 2022). Context-related bias may also have occurred if participants placed greater emphasis on partnered sexual experiences than on solitary ones (Fahs, 2014), even with counterbalanced questioning. Recall bias was another concern, as participants were asked to reflect on past orgasm experiences, which are inherently susceptible to memory inaccuracies (Raphael, 1987). In addition to the general recall bias associated with reporting on past events, the BSOS was originally intended to be completed within 30 minutes of orgasm (Dubray et al., 2017); however, participants in this study were asked to recall orgasm experiences within a two-week time period, consistent with the instructions for the ORS (Mah & Binik, 2010), which may have reduced accuracy. Furthermore, asking participants to rate their most recent orgasm may not reflect their typical experience and could be biased by particularly positive or negative events, as emotionally intense experiences are more salient in memory than neutral ones (Kensinger, 2009).

Some limitations were specific to Study 1, particularly in relation to statistical analyses. Factor analysis of the ORS and BSOS revealed a gradual levelling off in the scree plots, suggesting that the scales may not have clearly distinct subscales. Determining the number of factors to extract from these plots required subjective researcher judgment, which may have influenced the resulting factor structure. Certain factors could potentially be strengthened by revising items with lower primary loadings and adding new items to enhance construct coverage. Within multi-group confirmatory factor analysis, cross-loadings were added to the solitary and partnered versions of the BSOS model to achieve adequate fit; these post hoc modifications represent an exploratory, “data-driven” approach rather than a “theory-driven” strategy (Putnick & Bornstein, 2016). This is a limitation because such adjustments may be influenced by

characteristics unique to the current sample rather than fully generalizable relationships, potentially affecting replication and the theoretical coherence of the model (MacCallum et al., 1992).

Similarly, certain limitations were specific to Study 2. Although several effects reached statistical significance, many were associated with small effect sizes, which limits their practical applicability (Serdar et al., 2021). The cross-sectional design also restricts interpretation, as it cannot establish temporal or causal relationships between variables (Tabachnick & Fidell, 1996). A longitudinal design would provide a stronger basis for examining developmental trajectories for the SOE from a lifespan perspective. Unique recall demands were also placed on post-menopausal participants, who were asked to describe orgasm experiences over adulthood and reflect on changes, increasing the potential for memory distortions. Moreover, post-menopausal women who had experienced orgasms, whether alone or with a partner, within the past two weeks may differ meaningfully from those without as recent orgasm experiences, who may not have been as represented in this dissertation. Finally, the qualitative content analysis introduced its own constraints. Relying on code frequency to determine significant meanings in narrative text risks losing contextual nuance (Morgan, 1993), as higher frequency may reflect a greater willingness to discuss a topic or stronger personal relevance rather than its actual importance (Vaismoradi et al., 2013). As with most qualitative research, these findings are not intended to be generalizable and instead reflect the experiences of participants in this study (Sutton & Austin, 2015).

Conclusion

This dissertation amplifies the voices and perspectives of older women. Centering their experiences offers a more comprehensive understanding of women's orgasm experiences across

adulthood and challenges the enduring narrative of the inevitable sexual decline and/or cessation of sexual activity with age. Instead, this dissertation research demonstrated that sexuality in later life is diverse. Findings highlighted the complex interplay of biological, psychological, and social factors that shape the subjective experience of orgasm, underscoring that no single narrative can capture the breadth of women's lived experiences.

As illustrated in the series *Grace and Frankie*, growing older does not signify fading away but rather an opportunity to rewrite the script. Women's sexuality, like their lives, continues to expand, surprise, and redefine itself when given the freedom to evolve on their own terms. To a significant extent, sexuality in later life is what women make of it; whether that involves active participation or complete abstinence, it should remain a matter of individual choice. Mental and medical health professionals have an essential role in supporting women's autonomy and self-determination in this domain, recognizing sexual well-being as a fundamental dimension of health across the lifespan.

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Appendix A

Research Ethics Board Approval

Research Ethics Board Approval

File Number: H03-17-18 **Date (mm/dd/yyyy):** 05/30/2017

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Ethics Approval Notice

Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

First Name	Last Name	Affiliation	Role
Elke	Reissing	Social Sciences / Psychology	Principal Investigator
Amy	Webb	Social Sciences / Psychology	Co-investigator

File Number: H03-17-18

Type of Project: Professor

Title: Do all orgasms feel the same? A validation and exploratory study of the Orgasm Rating Scale with women across the lifespan

Approval Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
05/30/2017	05/29/2018	Approval

Special Conditions / Comments:
N/A

Appendix B

Recruitment Script and Posters

Recruitment Scripts and Posters

Ladies! Participate in our study: Do All Orgasms Feel the Same? We would love to hear what you have to say!

ALTERNATIVELY Ladies! Ever wonder how orgasms change with age? Participate in our study: Do All Orgasms Feel the Same? We would love to hear what you have to say!
You could win a $50 CAD Visa gift card!

To Participate: http://uottawapsy.az1.qualtrics.com/jfe/form/SV_0Iimq9MLoRXsPgV
We are conducting research exploring women's orgasm experiences. We are seeking volunteer research participants to complete an online survey. Participants will be asked to read an information sheet on the study and chose to complete the demographic survey, and five other questionnaires, including questions about the effects of certain life events on orgasm quality, orgasm experience, and sexual function. This survey may take up to 50 minutes to complete, and all answers are completely anonymous and confidential. Participants must be 18 years or older, fluent in English, and have experienced an orgasm either alone or with a partner. The University has approved the ethical aspects of this study of Ottawa's Research Ethics Board. (File #: H03-17-18)

Primary Investigator
Dr. Elke Reissing, PhD, C Psych
Professor, School of Psychology
Director, HSR Laboratory
University of Ottawa

Research Coordinator

Amy Webb, PhD candidate
School of Psychology
Human Sexuality Research Laboratory
University of Ottawa

To Participate: http://uottawapsy.az1.qualtrics.com/jfe/form/SV_0Iimq9MLoRXsPgV

Poster #1

Poster #2

Appendix C

Information and Consent Form

Information and Consent Form

Participation

Thank you for your interest in participating in our study entitled *Do All Orgasms Feel the Same?*. The purpose of this information form is to ensure that you understand the purpose of the study and the nature of your involvement. We want to provide you with sufficient information for you to determine whether you wish to participate in the study. In order to decide if you would like to take part in this study, please read the following information carefully.

Purpose of the Study

This study aims to investigate the experiences of women's orgasms over the lifespan and is conducted by the primary investigator Dr. Elke Reissing and Amy Webb (Ph.D. candidate) through the Human Sexuality Research Laboratory (http://socialsciences.uottawa.ca/hslab-labosh/eng/) at the School of Psychology of the University of Ottawa. Amy Webb is the research coordinator of this project.

The goal of this study is to better understand women's orgasm experiences over the lifespan. Orgasm experiences can vary in quality and can be achieved either alone or with a partner. This is an online questionnaire study where all participants' responses are completely confidential and anonymous. Should you have any questions regarding the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5, by phone at 613-562-5387 or by email at ethics@uottawa.ca.

Eligibility

We are looking for women who are 18+ years of age, who are fluent in English, and have experienced an orgasm before, either by themselves OR with a partner.

Task Requirement and Duration

You will be asked to respond to a variety of questions regarding your past orgasm experiences, the effect of certain life events on orgasm quality, and sexual function. The survey will take approximately 50 minutes to complete. Please make sure you complete it in a private setting as your responses may be affected by the presence of others.

Risks

There is a possibility that you may feel uncomfortable or embarrassed answering questions about your sexuality or feel regret about having disclosed personal information. Remember that your participation is entirely voluntary, that you may choose not to answer a question should it make you feel uncomfortable, and that you may withdraw from the study at any time without penalty. Should you feel any distress, please contact Dr. Elke Reissing, a clinical psychologist specialized in sex therapy who can refer you to an appropriate resource. For international participants, Dr. Reissing has access to an international listserv and member referral service for health care professionals practicing sexual health consultation through her membership with the Society for Sex Therapy and Research. For those locations where services may be limited or unavailable, Dr. Reissing has reviewed online services (e.g., vaginismus.com) and is comfortable referring to alternative resources such as these. You can also consult resources on our website (http://socialsciences.uottawa.ca/human-sexuality-research/) as well as

the information in the Info Brochure provided to you at any time - per request or at any point you exit the online survey.

Benefits

We hope women who complete this survey will feel positively about contributing to health research that can benefit many other women. Some women may also learn more about their sexuality and sexual health.

Incentive to Participate

You will be given the option to enter your name in a draw to win one Visa gift certificate valued at $50 CAD to thank you for your time contributing to the research project. The draw is open to all research participants who enter in the draw, regardless of whether they decide to withdraw from further participating in the research project. To participate, you need to provide an email address by which we can contact you if you win the draw. Your email address will be used as a ballot and is not linked in any way to the responses you provide on the survey. If the person cannot be reached within 14 days from the date of the draw, the prize will be awarded to the second email address that is randomly selected and so on until the prize has been awarded. The odds of winning a prize depend on the number of participants in the study. The contact information you have provided will be kept confidential and then destroyed once the prizes have been awarded. We reserve the right to cancel the draw or cancel the awarding of the prize if the integrity of the draw, the research or the confidentiality of participants is compromised. The draw is governed by the applicable laws of Canada.

Anonymity and Confidentiality

Your answers will be anonymous. You will not be asked to identify yourself in the survey. No IP addresses are tracked. Any reports resulting from this study will not identify any participants. Please note that you will not be able to withdraw your data once you complete the study because its anonymous nature makes it impossible to trace your data back to you. Within the questionnaire there are a few open-ended questions, the content of which will be explored for overall associations and themes of shared or common experiences. Some participant responses to these questions may be partially quoted in scientific communications to illustrate themes. This will be done anonymously, and no identifying information whatsoever will be shared. For all other items, only group results will be reported, no individual results will be reported.

Your answers will also be confidential, such that only the members of the research team (Dr. Elke Reissing and Amy Webb), will have access to the data. All the data will be kept in password-protected files. All data on computers will be backed up on a password-protected memory stick. After 10 years, the data will be deleted. A unique ID will be assigned to your data. The research team has no access to your identity.

This survey is hosted by Qualtrics and their servers are in the United States, which makes your data subject to American data collection laws. To learn more about under what circumstances law enforcement can access this data, please visit www.justice.gov/archive/ll/highlights.htm. Please note that data collected through U.S. servers is subject to the US Patriot Act.

Finally, in order to minimize the risk of security breaches and to help ensure your confidentiality we recommend that you use standard safety measures such as signing out of your

account, closing your browser and locking your screen or device when you are no longer using them when you have completed the study.

Ethics approval

This study has received ethic's approval from the University of Ottawa's Office of Research Ethics and Integrity (File # H03-17-18). Feel free to send this survey (http://uottawapsy.az1.qualtrics.com/jfe/form/SV_0Iimq9MLoRXsPgV) to women in your social network who may be interested in participating, and/or share the link on your social media platform(s). If you wish to share information about the study in this manner, please also make sure to include the researchers' coordinates in all shares/posts.

Consent to Participate

I have read the above form and understand the conditions of my participation. My participation in this study is voluntary, and if for any reason, at any time, I wish to leave the experiment I may do so without having to give an explanation and with no penalty whatsoever. Furthermore, I understand that the data gathered in this study are anonymous and confidential. By proceeding to answer the questions on the next page, I am indicating that I consent to participate in this study.

Appendix D

Inclusion Criteria

Inclusion Criteria

Thank you for your interest in this study!

Before we proceed, we would like to ask you a couple questions in order to make sure you are eligible to participate.

- Are you 18 years of age or older ☐Yes ☐No
- Are you female? ☐Yes ☐No
- Are you fluent in English? ☐Yes ☐No
- Have you ever experienced an orgasm, either alone or with a partner? ☐Yes ☐No

Appendix E

Resource Sheet

Resource Sheet

Thank you very much for participating in our study. Your participation is very valuable as it contributes to the development of a better understanding of women's orgasm experiences.

Completing this questionnaire may have raised some questions about your health, well-being, and/or sexuality. Should this be the case, please do not hesitate to contact the following resources to discuss your concerns.

If you have any questions about the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5, by phone at 613-562-5387 or by email at ethics@uottawa.ca.

Please feel free to send the link to our study (http://_____) to women in your social network who may be interested in participating, and/or share the link on your social media platform(s). If you wish to share information about the study in this manner, please also make sure to include the researchers' coordinates in all shares/posts.

Health-Related Resources

If are you looking for more information about your sexual health or want to know more about menopause and sexuality, we recommend talking to your doctor or you can also consult these educational and supportive websites:

- **Canadian Physiotherapy Association**
  http://physiocanhelp.ca/incontinence/
- **Women's Health**
  http://www.womhealth.org.au/pelvic-floor
- **Healthy Women**
  http://www.healthywomen.org/healthcenter/reproductive-and-pelvic-health
- **North American Menopause Society (NAMS)**
  http://www.menopause.org
- **Menopause and U**
  http://menopauseandu.ca
- **Rainbow Health Ontario (RHO)**
  http://www.rainbowhealthontario.ca

Psychological Resources

Local Ottawa Area

- **Dr. Elke Reissing**
  Primary investigator of this study and clinical psychologist specialized in sex therapy; she can offer referrals and resources (over-the-phone consultation for respondents living outside the Ottawa-Gatineau area).
  Vanier Hall, room 4010, 136 Jean-Jacques Lussier, Ottawa, ON, K1N 6N5
  Tel: 613-562-5800 ext 4944
  Email: Elke.Reissing@uOttawa.ca
- **Dr. Caroline Ostiguy, Ph.D.**
  Gilmour Psychological Services
  Dr. Ostiguy is a Psychologist in private practice specializing in sexual health.
  437 Gilmour St., Ottawa, ON, K2P 0R5
  Tel.: 613-230-4709 (ex. 40)
- **Centre for Psychological Services and Research**
  Psychological services are provided by doctoral students, under the supervision of licensed Clinical Psychologists. Discounted prices are available.

University of Ottawa, Vanier Hall, Suite 4031, 136 Jean-Jacques Lussier, Ottawa, ON, K1N 6N5
Tel.: 613-562-5289

If you do not reside in the greater Ottawa area, please consult the following website for further information regarding the services available in your area:

- **Your Life Counts**
  A free online search engine that can assist in finding your nearest local distress center
  http://www.yourlifecounts.org/need-help/crisis-lines
- **Provincial and Territorial Psychological Associations: Online Referral Search**
  http://www.cpa.ca/public/whatisapsychologist/PTassociations/

Sexuality-Related Books and Websites

Should you have questions about your sexuality or are seeking to improve your sexual health and well-being, the following are excellent resources proving up-to-date and research-based information on a variety of topics related to sexual health and well-being.

- **Sexuality and U**
  A website created by the Society of Obstetricians and Gynecologists of Canada that provides accurate and up-to-date information on sexual health
  http://www.sexualityandu.ca/
- **Sexual Health portal of the Centre for Disease Control and Prevention**
  A United-States based website providing accurate and up-to-date information on sexual health
  http://www.cdc.gov/sexualhealth/
- **American Psychological Association, Aging and Human Sexuality Resource Guide**
  http://www.apa.org/pi/aging/resources/guides/sexuality.aspx
- **The Guide to Getting It On by Paul Joandis**
  A comprehensive book covering several sexuality-related topics
  http://www.goofyfootpress.com/
- **Better Orgasms Better Worlds by Betty Dodson with Carlin Ross**
  A portal created by sex educators Betty Dodson and Carlin Ross on female sexuality, a rich collection of articles, videos, arts, and other resources on female sexuality and sexual well-being
  http://dodsonandross.com/
- **The New Male Sexuality: The Truth About Men, Sex, and Pleasure by Bernie Zilbergeld**
  Addresses a broad range of topics regarding the sexuality of men
  http://www.amazon.ca/The-New-Male-Sexuality-Pleasure/dp/0553380427
- **Naked at Our Age; Talking Outloud About Senior Sex.**
  Price, J. (2011). Berkley, CA; Seal Press.
- **Sex over 50.**
  Block, J. D., & Bakos, S. C. (1999). Paramus, NJ: Reward Books.
- **Sexuality & Long-term Care: Understanding and Supporting the Needs of Older Adults.**
  Doll, G. A. (2012). Baltimore: Health Professions Press.

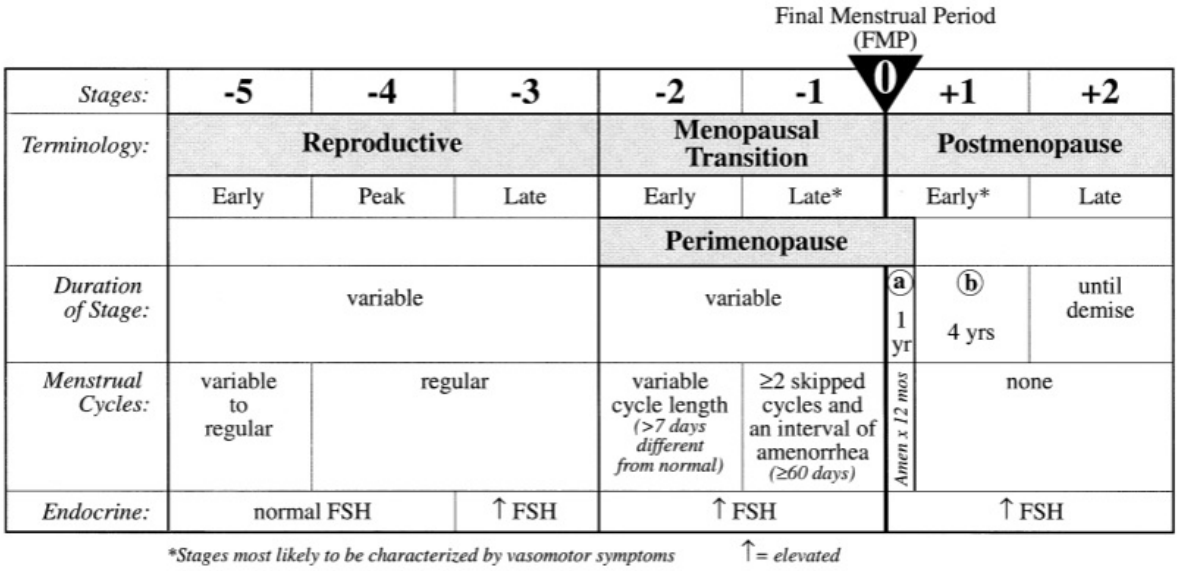
Appendix F

STRAW Staging System

STRAW Staging System

FIGURE 1

The STRAW staging system.



Soules. Executive Summary of STRAW. Fertil Steril 2001.

Appendix G

Questionnaire Package

Questionnaire Package

Thank you for participating in our study to better understand the experiences of women and sexuality!

Menopausal Status

We would like to start off with some information about your current hormonal status. The following questions will refer to your menstrual cycles and menopausal status, if applicable.

1. How old are you? _____

2. Are you menstruating monthly?
   Yes
   Yes, but irregularly. Please describe what "menstruating monthly, but irregularly" means to you (e.g., only every 2 or 3 months, or, it has been 4 months since...) _____
   No
   No, I'm pregnant
   No, due to birth control

3. Has it been **at least** 12 months since your last period?
   Yes
   No. How many months has it been since your last period? _____

4. At what age did you have your last menstrual period? _____

5. If any, what physical symptoms associated with menopause are you experiencing (i.e., hot flashes, flushing, night sweats)? Please describe. _____

6. If any, what psychological symptoms associated with menopause are you experiencing (i.e., insomnia, irritability, anxiety, depression, fatigue, forgetfulness)? Please describe.
_____

7. Have you undergone any of the following resulting in menopause?
   Yes, hysterectomy
   Yes, Oophorectomy
   Yes, other. Please specify what "other" resulted in menopause. _____
   No

8. If you are post-menopause, do you take any of the following? (Post-menopause means 12 months since your LAST menstrual period.). Select all that apply.
   Hormone replacement therapy (HRT). Please specify which hormones, or name of hormone replacement therapy (HRT). _____
   Systemic (pill)
   Topical systemic (patch)
   Topical localized (vaginal cream)

Other. Please describe. _____
No
N/A

Children Information

1. Do you have any children?
Yes
No

2. How many children did you have in the following ways? Please complete for all that apply.
Vaginally. Number of children _____
C-section. Number of children _____
Adopted children. Number of children _____
Step-children/through relationship. Number of children _____

Relationship Information

1. What is your current relationship status?
Single
Single, but casually dating
In a committed relationship, not living together
In a committed relationship, living together
Married
Divorced/separated
Widowed
Other. Please describe _____

2. If applicable, how long have you been with your current partner? _____

3. If applicable, how satisfied are you with your current relationship?

1	2	3	4	5
Extremely satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Extremely dissatisfied

4. If applicable, how would you describe your partner`s current, overall, **physical** health?

1	2	3	4	5
Poor		Average		Excellent

5. If applicable, how would you describe your partner`s current, overall, **mental** health?

1	2	3	4	5
Poor		Average		Excellent

6. To whom are you the most sexually attracted to?
Only men
Mostly men
Men and women equally
Mostly women
Only women
None/Don't know

7. With whom have you have the most sexual contact?
Only men
Mostly men
Men and women equally
Mostly women
Only women
None/Don't know

Solitary Orgasm

INSTRUCTIONS: In this section we will be asking you specific questions about recent orgasms you may have had <u>while masturbating</u>. Please be as honest as possible when answering.

1. Have you ever experienced an orgasm, **<u>while alone, through masturbation</u>**?
Yes
No

2. In general, how much <u>effort</u> does it take for you to have an orgasm, <u>through masturbation</u>?
No effort
Some effort
Moderate effort
A lot of effort
It takes significant effort

3. <u>How</u> has the <u>effort</u> in which you have orgasms, through masturbation, changed over your lifetime (if applicable)? Please describe. _____

Orgasm Rating Scale - Solitary

INSTRUCTIONS: Try to remember the <u>most recent orgasm</u> you have experienced <u>through masturbation</u>. If you cannot recall the last one you have had, recall the most recent orgasm you can remember**.**

1. How long ago did you have your most recent orgasm through masturbation? (ex: 6 days, 5 months, 9 years) _____

2. To the best of your memory, how did you have this orgasm?

Through manual stimulation with my fingers
Through stimulation using a sex toy/sexual device
Other. Please describe. _____

INSTRUCTIONS: Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience, and so there is no "right" answer. After each word, choose the option that best indicates how well that word describes your most recent orgasm you have experienced through masturbation according to this scale:

Please rate all the words (do not skip any)

Does not describe it at all					Describes it perfectly
1	2	3	4	5	6

1. Building	1	2	3	4	5	6
2. Swelling	1	2	3	4	5	6
3. Flooding	1	2	3	4	5	6
4. Flowing	1	2	3	4	5	6
5. Flushing	1	2	3	4	5	6
6. Spreading	1	2	3	4	5	6
7. Shooting	1	2	3	4	5	6
8. Spurting	1	2	3	4	5	6
9. Throbbing	1	2	3	4	5	6
10. Pulsating	1	2	3	4	5	6
11. Shuddering	1	2	3	4	5	6
12. Trembling	1	2	3	4	5	6
13. Quivering	1	2	3	4	5	6
14. Close	1	2	3	4	5	6
15. Loving	1	2	3	4	5	6
16. Passionate	1	2	3	4	5	6
17. Tender	1	2	3	4	5	6
18. Unifying	1	2	3	4	5	6
19. Ecstatic	1	2	3	4	5	6
20. Elated	1	2	3	4	5	6
21. Euphoric	1	2	3	4	5	6
22. Rapturous	1	2	3	4	5	6
23. Pleasurable	1	2	3	4	5	6

24. Satisfying	1	2	3	4	5	6
25. Fulfilling	1	2	3	4	5	6
26. Relaxing	1	2	3	4	5	6
27. Peaceful	1	2	3	4	5	6
28. Soothing	1	2	3	4	5	6

29. What other words would you use to describe your most recent orgasm through masturbation?

_____

Bodily Sensations of Orgasm Scale – Solitary

INSTRUCTIONS: To what extent did you feel the following sensations during your most recent orgasm through masturbation according to this scale:

Not at all	Some	Moderately	A lot	Extremely
1	2	3	4	5

Please rate all (do not skip any).

1. Increased heart beat	1	2	3	4	5
2. Heart beating stronger	1	2	3	4	5
3. Faster breathing	1	2	3	4	5
4. Overall muscle tension	1	2	3	4	5
5. Choppy/shallow breathing	1	2	3	4	5
6. Increased blood pressure	1	2	3	4	5
7. Moaning	1	2	3	4	5
8. Hardening nipples	1	2	3	4	5
9. Vulvar (i.e., genitals outside body) pulsation	1	2	3	4	5
10. Shivers/goose bumps	1	2	3	4	5
11. Anal contraction	1	2	3	4	5
12. Hypersensitive clitoris	1	2	3	4	5
13. Clitoral pulsation	1	2	3	4	5
14. Lower limb spasms	1	2	3	4	5
15. Abdominal contraction	1	2	3	4	5
16. Intracranial (i.e., inside head pressure)	1	2	3	4	5
17. Feeling of tightness in chest	1	2	3	4	5
18. Cranial (i.e., head) pulsations/headache	1	2	3	4	5
19. Facial tingling	1	2	3	4	5

20. Reddening of the ears/skin rash	1	2	3	4	5
21. Sweating	1	2	3	4	5
22. Hot flashes	1	2	3	4	5

23. During or after this orgasm, you may have experienced physical sensations throughout your body (e.g., spasms, throbbing, tension). How **intense** were these physical sensations overall?
Very weak

Very strong

24. During or after this orgasm, you may have experienced other feelings that were more psychological rather than physical (e.g., satisfaction, feelings of peacefulness or relaxation, ecstasy, love). How **intense** were these feelings overall?
Very weak

Very strong

25. How does your most recent orgasm through masturbation **compare** to the best or most pleasurable orgasm you have ever had while masturbating?
Nothing like it at all
Minimally similar
Somewhat similar
Very similar
My most recent orgasm is the best/most pleasurable orgasm I have ever had while masturbating.

26. How old were you when you had the best or most pleasurable orgasm you have ever had while masturbating? If you cannot remember, please approximate. _____

27. Please describe, in what ways does your most recent orgasm **differ** from the best or most pleasurable orgasm you have ever had while masturbating? _____

28. How has your experience of orgasm, through masturbation, changed throughout your life? Please elaborate. _____

Partnered Orgasm

INSTRUCTIONS: In this section we will be asking you specific questions about recent orgasms you may have had with a partner. Please be as honest as possible when answering.

1. Have you ever experienced an orgasm, **with a partner**?
Yes

No

2. In general, how much effort does it take for you to have an orgasm, with a partner?
No effort
Some effort
Moderate effort
A lot of effort
It takes significant effort

3. How has the effort in which you have orgasms, with a partner, changed over your lifetime (if applicable)? Please describe. _____

Orgasm Rating Scale - Partnered

INSTRUCTIONS: Try to remember the most recent orgasm you have experienced with a partner. If you cannot recall the last one you have had, recall the most recent orgasm you can remember**.**

1. How long ago did you have your most recent orgasm with a partner? (ex: 6 days, 5 months, 9 years) _____

2. To the best of your memory, how did you have this orgasm?
Through oral stimulation from partner
Through manual stimulation from partner
Through manual stimulation during intercourse
Through manual stimulation from myself while in the presence of a partner
Through intercourse (e.g., vaginal/anal/other)
Other. Please describe. _____

3. For how long have/had you been sexually active with this partner? _____

INSTRUCTIONS: Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience, and so there is no "right" answer. After each word, choose the option that best indicates how well that word describes your most recent orgasm you have experienced with a partner according to this scale:

Does not describe it at all					Describes it perfectly
1	2	3	4	5	6

Please rate all the words (do not skip any)

1. Building 1 2 3 4 5 6

2. Swelling	1	2	3	4	5	6
3. Flooding	1	2	3	4	5	6
4. Flowing	1	2	3	4	5	6
5. Flushing	1	2	3	4	5	6
6. Spreading	1	2	3	4	5	6
7. Shooting	1	2	3	4	5	6
8. Spurting	1	2	3	4	5	6
9. Throbbing	1	2	3	4	5	6
10. Pulsating	1	2	3	4	5	6
11. Shuddering	1	2	3	4	5	6
12. Trembling	1	2	3	4	5	6
13. Quivering	1	2	3	4	5	6
14. Close	1	2	3	4	5	6
15. Loving	1	2	3	4	5	6
16. Passionate	1	2	3	4	5	6
17. Tender	1	2	3	4	5	6
18. Unifying	1	2	3	4	5	6
19. Ecstatic	1	2	3	4	5	6
20. Elated	1	2	3	4	5	6
21. Euphoric	1	2	3	4	5	6
22. Rapturous	1	2	3	4	5	6
23. Pleasurable	1	2	3	4	5	6
24. Satisfying	1	2	3	4	5	6
25. Fulfilling	1	2	3	4	5	6
26. Relaxing	1	2	3	4	5	6
27. Peaceful	1	2	3	4	5	6
28. Soothing	1	2	3	4	5	6

29. What other words would you use to describe your most recent orgasm with a partner?

_____

Bodily Sensations of Orgasm Scale – Partnered

INSTRUCTIONS: To what extent did you feel the following sensations during your most recent orgasm with a partner according to this scale:

Not at all	Some	Moderately	A lot	Extremely

1	2	3	4	5

Please rate all (do not skip any).

1.	Increased heart beat	1	2	3	4	5
2.	Heart beating stronger	1	2	3	4	5
3.	Faster breathing	1	2	3	4	5
4.	Overall muscle tension	1	2	3	4	5
5.	Choppy/shallow breathing	1	2	3	4	5
6.	Increased blood pressure	1	2	3	4	5
7.	Moaning	1	2	3	4	5
8.	Hardening nipples	1	2	3	4	5
9.	Vulvar (i.e., genitals outside body) pulsation	1	2	3	4	5
10.	Shivers/goose bumps	1	2	3	4	5
11.	Anal contraction	1	2	3	4	5
12.	Hypersensitive clitoris	1	2	3	4	5
13.	Clitoral pulsation	1	2	3	4	5
14.	Lower limb spasms	1	2	3	4	5
15.	Abdominal contraction	1	2	3	4	5
16.	Intracranial (i.e., inside head pressure)	1	2	3	4	5
17.	Feeling of tightness in chest	1	2	3	4	5
18.	Cranial (i.e., head) pulsations/headache	1	2	3	4	5
19.	Facial tingling	1	2	3	4	5
20.	Reddening of the ears/skin rash	1	2	3	4	5
21.	Sweating	1	2	3	4	5
22.	Hot flashes	1	2	3	4	5

23. During or after this orgasm, you may have experienced physical sensations throughout your body (e.g., spasms, throbbing, tension). How **intense** were these physical sensations overall?

Very weak

Very strong

24. During or after this orgasm, you may have experienced other feelings that were more psychological rather than physical (e.g., satisfaction, feelings of peacefulness or relaxation, ecstasy,

love). How **intense** were these feelings overall?
Very weak

Very strong

25. How does your most recent orgasm with a partner **compare** to the best or most pleasurable orgasm you have ever had with a partner?
Nothing like it at all
Minimally similar
Somewhat similar
Very similar
My most recent orgasm is the best/most pleasurable orgasm I have ever had with a partner.

26. How old were you when you had the best or most pleasurable orgasm you have ever had with a partner? If you cannot remember, please approximate. _____

27. Please describe, in what ways does your most recent orgasm **differ** from the best or most pleasurable orgasm you have ever had with a partner? _____

28. How has your experience of orgasm, with a partner, changed throughout your life? Please elaborate. _____

Life Events Impacting the Quality of Orgasm

INSTRUCTIONS: In this section we will be asking you about different life events you may have experienced and how you feel those have impacted the quality of your orgasms (either alone with masturbation or with a sexual partner). Quality of orgasm may mean amount of pleasure, intensity, and/or the effort it takes to achieve orgasm, etc.

Please rate the change in quality according to this scale. Since experiencing this life event, the quality of my orgasm has…

Significantly decreased	Moderately decreased	Slightly decreased	Not changed	Slightly increased	Moderately increased	Significantly increased
1	2	3	4	5	6	7

If you have not experienced the life event listed, please skip to the next life event.

Since experiencing this life event, the quality of my orgasm has...

1. Starting my period 1 2 3 4 5 6 7
2. Perimenopause (i.e., experiencing irregular periods, having not had a period in 3-11 months, and/or have experienced menopause symptoms (e.g., hot flashes, night sweats, or vaginal dryness) 1 2 3 4 5 6 7

3. Menopause (i.e., not having a period in at least 12 months)	1	2	3	4	5	6	7
4. Hysterectomy	1	2	3	4	5	6	7
5. First trimester of pregnancy	1	2	3	4	5	6	7
6. Second trimester of pregnancy	1	2	3	4	5	6	7
7. Third trimester of pregnancy	1	2	3	4	5	6	7
8. Vaginal childbirth	1	2	3	4	5	6	7
9. C-section childbirth	1	2	3	4	5	6	7
10. Orgasm during childbirth	1	2	3	4	5	6	7
11. 6-months postpartum	1	2	3	4	5	6	7
12. 6-12 months postpartum	1	2	3	4	5	6	7
13. Adopted a child/children	1	2	3	4	5	6	7
14. Been a parent	1	2	3	4	5	6	7
15. Started taking prescription medication	1	2	3	4	5	6	7
16. Stopped taking prescription medication	1	2	3	4	5	6	7
17. Developed a serious illness	1	2	3	4	5	6	7
18. Recovered from a serious illness	1	2	3	4	5	6	7
19. Developed a mental illness	1	2	3	4	5	6	7
20. Recovered from a mental illness	1	2	3	4	5	6	7
21. Vaginal/pelvic pain	1	2	3	4	5	6	7
22. Had a significant surgery/recovery	1	2	3	4	5	6	7
23. Vaginal dryness/not enough lubrication	1	2	3	4	5	6	7
24. Significant weight gain	1	2	3	4	5	6	7
25. Significant weight loss	1	2	3	4	5	6	7
26. Felt positively about my body	1	2	3	4	5	6	7
27. Felt negatively about my body	1	2	3	4	5	6	7
28. Been consistently physically active	1	2	3	4	5	6	7
29. Been consistently physically inactive	1	2	3	4	5	6	7
30. Married	1	2	3	4	5	6	7
31. Divorced/separated	1	2	3	4	5	6	7
32. Death of a loved one	1	2	3	4	5	6	7
33. Experienced sexual assault/violence	1	2	3	4	5	6	7
34. Been satisfied in a romantic relationship	1	2	3	4	5	6	7
35. Been unsatisfied in a romantic relationship	1	2	3	4	5	6	7

36. As I have gotten older, the quality of my orgasm has:

1	2	3	4	5	6	7
Significantly decreased	Moderately decreased	Slightly decreased	Not changed	Slightly increased	Moderately increased	Significantly increased

We would love to learn more!

37. Please describe the change in the quality of your orgasm as you've gotten older.
_____
38. If the quality of your orgasm has changed since menopause, please describe how/your experience. _____
39. If the quality of your orgasm has changed since becoming a parent/giving birth, please describe how/your experience. _____
40. If the quality of your orgasm changed since starting/stopping a prescription medication, please indicate which medication and describe how the quality was impacted.
_____
41. If the quality of your orgasm changed since developing/recovering from a physical or mental illness, please indicate which physical or mental illness and describe how the quality was impacted. _____
42. If you would like to provide additional information about your experience with one, or more, of these life events, please use the space below. _____
43. If you would like to provide additional information about your experience with one, or more, of these life events, please use the space below. _____
44. Please indicate any 3 life events you feel positively affected the quality of your orgasm the most over your life. Quality of orgasm may mean amount of pleasure, intensity, and/or the effort it takes to achieve orgasm, etc.

_____
_____
_____

45. How have these life events positively impacted the quality of your orgasm?
_____
46. Please indicate any 3 life events you feel negatively affected the quality of your orgasm the most over your life. Quality of orgasm may mean amount of pleasure, intensity, and/or the effort it takes to achieve orgasm, etc.

_____
_____
_____

47. How have these life events negatively impacted the quality of your orgasm?
_____

Sexual Experiences

INSTRUCTIONS: The following questions ask about your sexual experiences. If you are not currently in an intimate relationship with a partner, answer these questions about the last intimate partner you have had. You are asked to rate each item on the scale provided.

Please indicate what percentage of the time by selecting along the scale to indicate your response.

1. What percentage of the time do you have an orgasm from vaginal penetration only (no direct clitoral stimulation) during intercourse with a partner?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

2. What percentage of the time do you have an orgasm from intercourse with a partner that includes both vaginal penetration and clitoral stimulation?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

3. What percentage of the time do you have orgasms from hand/manual stimulation of your genitals/clitoris by a partner?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

4. What percentage of the time do you have an orgasm when you touch your own genitals/clitoris while you are with a partner?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

5. What percentage of the time do you have an orgasm from oral stimulation of your genitals/clitoris by a partner?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

6. In general, how satisfied/unsatisfied are you with the quality or experience of orgasm that you have during sexual activity with a partner?

Very satisfied
Moderately satisfied
Slightly satisfied
Neither satisfied nor dissatisfied
Slightly dissatisfied
Moderately dissatisfied
Very dissatisfied

7. In general, how satisfied/unsatisfied are you with the number of orgasms that you have during solitary masturbation?

Very satisfied
Moderately satisfied
Slightly satisfied
Neither satisfied nor dissatisfied
Slightly dissatisfied
Moderately dissatisfied
Very dissatisfied

8. In general, how satisfied/unsatisfied are you with the quality or experience of orgasm that you have during solitary masturbation?

Very satisfied
Moderately satisfied
Slightly satisfied
Neither satisfied nor dissatisfied
Slightly dissatisfied
Moderately dissatisfied
Very dissatisfied

Female Sexual Function Index

INSTRUCTIONS: These questions ask about your sexual feelings and responses during the past 4 weeks. Please answer the following questions as honestly and clearly as possible. Your responses will be kept completely confidential. In answering these questions, the following definitions apply:

1. *Sexual activity* can include caressing, foreplay, masturbation and vaginal intercourse.
2. *Sexual intercourse* is defined as penile penetration (entry) of the vagina.
3. *Sexual stimulation* includes situations like foreplay with a partner, self-stimulation (masturbation), or sexual fantasy.

Check only one box per question**.**

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

1. Over the past 4 weeks, how **often** did you feel sexual desire or interest?
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)
Almost never or never

2. Over the past 4 weeks, how would you rate your **level** (degree) of sexual desire or interest?
Very high
High
Moderate
Low

Very low or none at all

Sexual arousal is a feeling that includes both physical and mental aspects of sexual excitement. It may include feelings of warmth or tingling in the genitals, lubrication (wetness), or muscle contractions.

3. Over the past 4 weeks, how **often** did you feel sexually aroused ("turned on") during sexual activity or intercourse?
No sexual activity
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)
Almost never or never

4. Over the past 4 weeks, how would you rate your **level** of sexual arousal ("turn on") during sexual activity or intercourse?
No sexual activity
Very high
High
Moderate
Low
Very low or none at all

5. Over the past 4 weeks, how **confident** were you about becoming sexually aroused during sexual activity or intercourse?
No sexual activity
Very high confidence
High confidence
Moderate confidence
Low confidence
Very low or no confidence

6. Over the past 4 weeks, how **often** have you been satisfied with your arousal (excitement) during sexual activity or intercourse?
No sexual activity
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)
Almost never or never

7. Over the past 4 weeks, how **often** did you become lubricated ("wet") during sexual activity or intercourse?
No sexual activity
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)

Almost never or never

8. Over the past 4 weeks, how **difficult** was it to become lubricated ("wet") during sexual activity or intercourse?
No sexual activity
Extremely difficult or impossible
Very difficult
Difficult
Slightly difficult
Not difficult

9. Over the past 4 weeks, how often did you **maintain** your lubrication ("wetness") until completion of sexual activity or intercourse?
No sexual activity
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)
Almost never or never

10. Over the past 4 weeks, how **difficult** was it to maintain your lubrication ("wetness") until completion of sexual activity or intercourse?
No sexual activity
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)
Almost never or never

10. Over the past 4 weeks, how **often** did you experience discomfort or pain during vaginal penetration?
Did not attempt intercourse
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)
Almost never or never

11. Over the past 4 weeks, when you had sexual stimulation or intercourse, how **often** did you reach orgasm (climax)?
No sexual activity
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)
Almost never or never

12. Over the past 4 weeks, when you had sexual stimulation or intercourse, how **difficult** was it for you to reach orgasm (climax)?
- No sexual activity
- Extremely difficult or impossible
- Very difficult
- Difficult
- Slightly difficult
- Not difficult

13. Over the past 4 weeks, how **satisfied** were you with your ability to reach orgasm (climax) during sexual activity or intercourse?
- No sexual activity
- Very dissatisfied
- Moderately dissatisfied
- About equally satisfied and dissatisfied
- Moderately satisfied
- Very satisfied

14. Over the past 4 weeks, how **satisfied** have you been with the amount of emotional closeness during sexual activity between you and your partner?
- No sexual activity
- Very dissatisfied
- Moderately dissatisfied
- About equally satisfied and dissatisfied
- Moderately satisfied
- Very satisfied

15. Over the past 4 weeks, how **satisfied** have you been with your sexual relationship with your partner?
- No sexual activity
- Very dissatisfied
- Moderately dissatisfied
- About equally satisfied and dissatisfied
- Moderately satisfied
- Very satisfied

16. Over the past 4 weeks, how **satisfied** have you been with your overall sexual life?
- No sexual activity
- Very dissatisfied
- Moderately dissatisfied
- About equally satisfied and dissatisfied
- Moderately satisfied
- Very satisfied

17. Over the past 4 weeks, how **often** did you experience discomfort or pain during vaginal penetration?
Did not attempt intercourse
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)
Almost never or never

18. Over the past 4 weeks, how **often** did you experience discomfort or pain following vaginal penetration?
Did not attempt intercourse
Almost always or always
Most times (more than half the time)
Sometimes (about half the time)
A few times (less than half the time)
Almost never or never

19. Over the past 4 weeks, how would you rate your **level** (degree) of discomfort or pain during or following vaginal penetration?
Did not attempt intercourse
Very high
High
Moderate
Low
Very low or none at all

Demographic Questionnaire

1. In what country do you live? _____ .

2. How tall are you? _____ ft _____ inches --- _____ meter_____ cm.

3. What is your current weight? _____ pounds --- _____kilograms.

4. What is your highest level of education?
Grade school
High school
College/University degree
Graduate degree
Post Graduate degree

5. What is your approximate household income?
Under 25,000
25,000 - 49,999
50,000 - 79,999

80,000 - 119,999
Over 120,000

6. What is your ethnicity (example: Caucasian, Aboriginal): _____

7. How religious would you describe yourself?
Not at all religious
A little religious
Somewhat religious
Very religious
Extremely religious

8. If you are religious, what is your religious affiliation? _____

9. How would you describe your current, overall physical health? (Please circle).

1	2	3	4	5
Poor				Excellent

10. How would you describe your current, overall mental health? (Please circle).

1	2	3	4	5
Poor				Excellent

11. How often do you exercise (i.e., minimum of 30 minutes of activity that significantly increases your heart rate and/or includes weight/resistance work)?
Daily
More than once a week
Once a week
More than once a month
Monthly
A few times a year
Never or almost never

12. Are you currently taking hormonal contraceptives (e.g., birth control pills, the needle, the patch, hormonal I.U.D.)?
Yes
No
I don't know

13. Are you currently taking NON-hormonal contraceptives (e.g., condoms, copper I.U.D./NON-hormonal I.U.D.)?
Yes
No
I don't know

14. Which, if any, other medications are you currently taking? _____

Appendix H

Menopausal Status Decision Tree

Menopausal Status Decision Tree

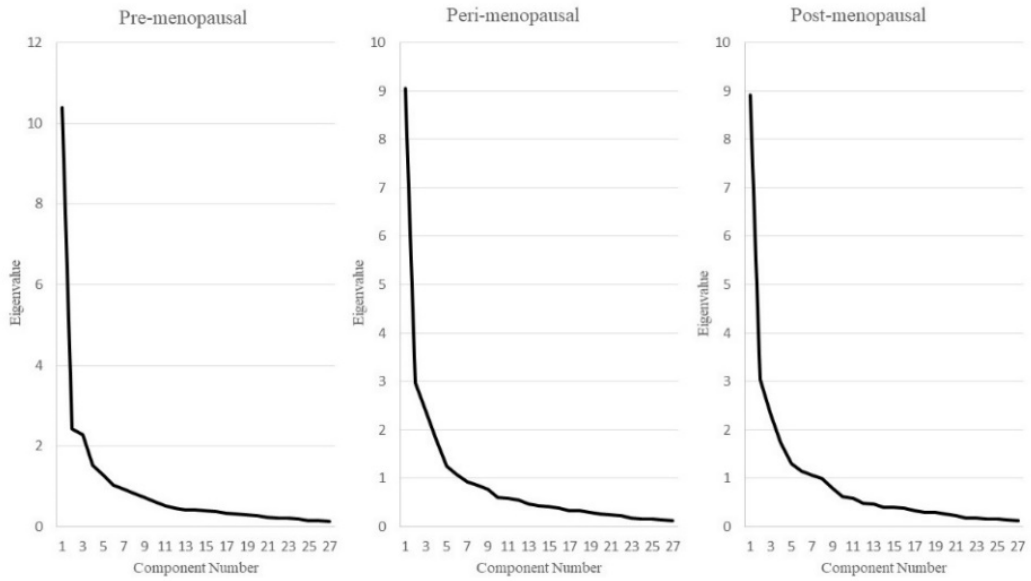
1. Age 40-60, inclusive?
    a. Yes. Go to "2. Monthly"
    b. No. < 40 years old? = Pre-menopause
    c. No. > 60 years old? = Post-menopause
2. Monthly (Are you menstruating monthly?)

   a. Yes = Pre-menopause
   b. Yes, but irregularly. Go to “5. Monthly Describe”
   c. No. Go to “5. Monthly Describe”
   d. No, I’m pregnant = Pre-menopause
   e. No, due to birth control. Go to “4. Physical Symptoms” and “Psychological Symptoms”.
3. Months Since (How long since your last period?)
   a. < 2 months since last period = Pre-menopause
   b. ≥ 2 months and < 1 year = Peri-menopause
   c. ≥ 1 year = Post-menopause
   d. Not enough information to determine. Go to “4. Physical Symptoms” and “Psychological Symptoms”
4. Physical Symptoms and Psychological Symptoms
   a. Are any symptoms endorsed?
      i. Yes. ≥ 58 years old = Post-menopause
      ii. Yes. < 58 years old = Peri-menopause
      iii. No. ≥ 58 years old = Post-menopause
      iv. No. ≥ 40 and < 58 years old = Peri-menopause
      v. No. < 40 years old = Pre-menopause
5. Monthly Describe
   a. < 2 months since last period = Pre-menopause
   b. ≥ 2 months and < 1 year = Peri-menopause
   c. ≥ 1 year = Post-menopause
   d. Not enough information to determine. Go to “3. Months Since”

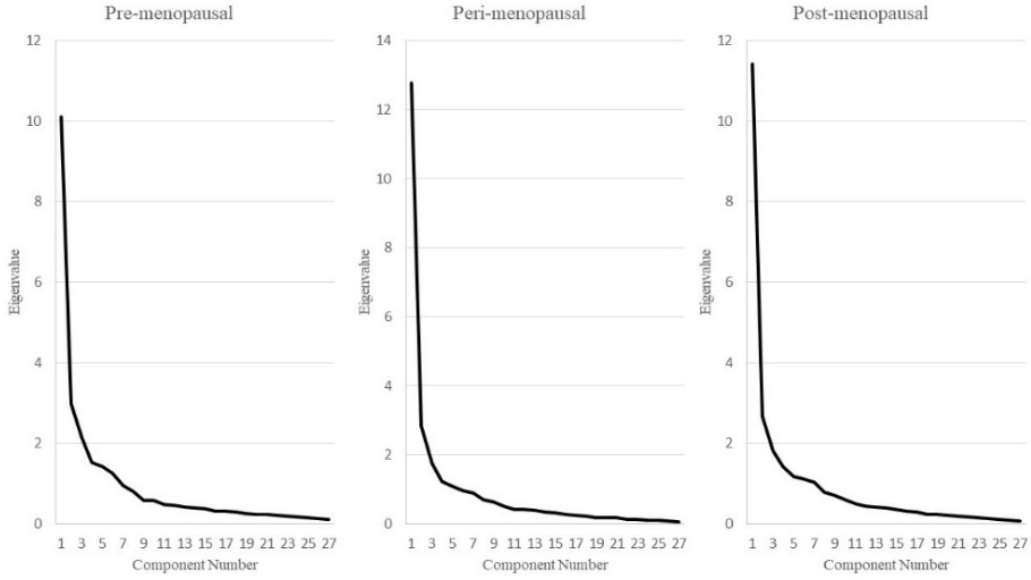
Appendix I

Scree Plots for the ORS and BSOS by Menopausal Status and Sexual Context

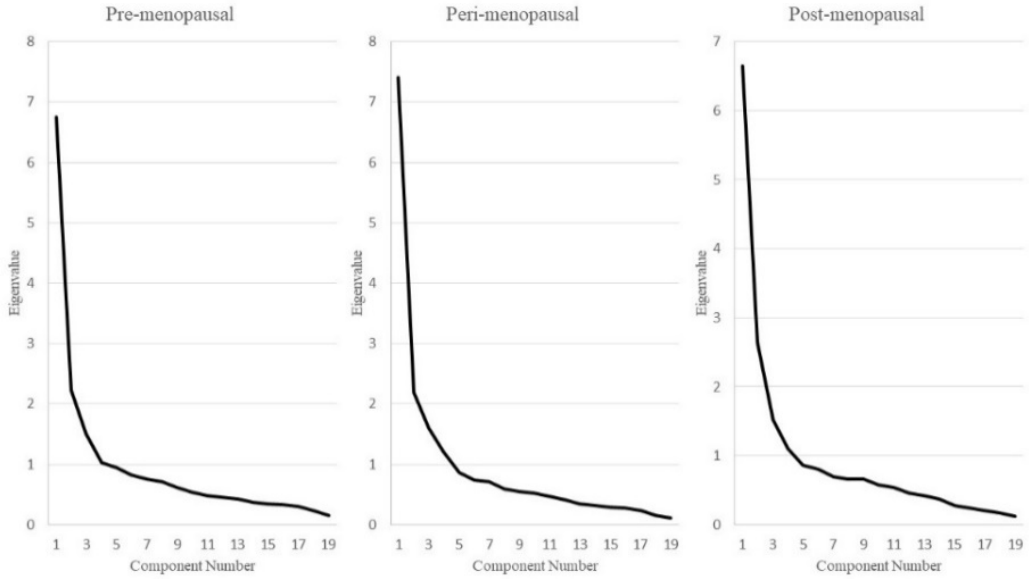
Scree Plots for the ORS and BSOS by Menopausal Status and Sexual Context



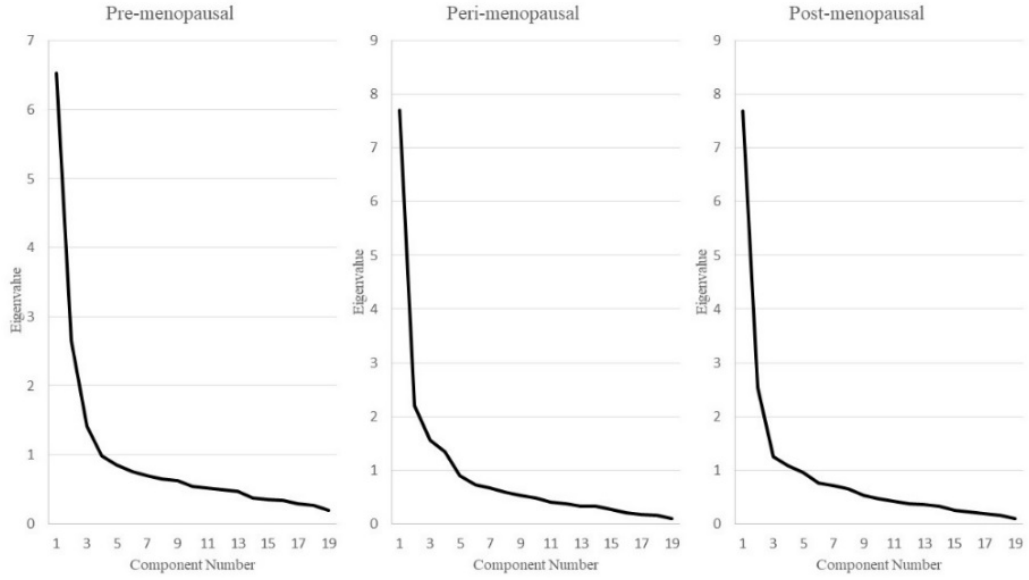
Note. Scree plots for ORS (solitary) by menopausal status



Note. Scree plots for ORS (partnered) by menopausal status



Note. Scree plots for BSOS (solitary) by menopausal status



Note. Scree plots for BSOS (partnered) by menopausal status

Appendix J

Correlation Matrices for the Orgasm Rating Scale by Menopausal Status and Sexual Context

Correlation Matrices for the ORS by Menopausal Status and Sexual Context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	close																											
2	loving	.41																										
3	passionate	.37	.78																									
4	tender	.40	.77	.69																								
5	unifying	.46	.73	.65	.76																							
6	ecstatic	.36	.53	.51	.56	.54																						
7	elated	.38	.58	.51	.56	.58	.78																					
8	euphoric	.35	.39	.41	.39	.37	.68	.69																				
9	rapturous	.36	.50	.47	.51	.45	.63	.59	.58																			
10	pleasurable	.19	.19	.21	.23	.20	.40	.37	.44	.32																		
11	satisfying	.17	.25	.26	.25	.25	.42	.36	.42	.31	.75																	
12	fulfilling	.26	.40	.37	.39	.37	.53	.52	.54	.44	.57	.68																
13	relaxing	.29	.32	.30	.29	.30	.37	.37	.40	.31	.53	.59	.58															
14	peaceful	.36	.49	.39	.50	.51	.45	.49	.45	.42	.41	.45	.62	.67														
15	soothing	.32	.42	.33	.48	.46	.40	.45	.41	.41	.44	.49	.55	.71	.84													
16	building	.23	.07	.06	.12	.17	.21	.25	.25	.24	.40	.32	.23	.21	.21	.26												
17	swelling	.26	.13	.12	.17	.22	.33	.33	.36	.36	.27	.21	.25	.21	.27	.27	.52											
18	flooding	.30	.25	.20	.33	.25	.39	.36	.39	.48	.28	.27	.33	.28	.37	.37	.32	.44										
19	flowing	.35	.36	.24	.42	.32	.38	.36	.31	.41	.25	.26	.29	.24	.39	.36	.29	.32	.65									
20	flushing	.31	.26	.28	.35	.30	.33	.34	.25	.35	.19	.19	.21	.20	.29	.30	.23	.37	.54	.59								
21	spreading	.36	.27	.30	.27	.27	.30	.34	.25	.32	.25	.23	.22	.26	.26	.33	.40	.35	.38	.36	.48							
22	shooting	.35	.29	.30	.31	.27	.33	.34	.29	.45	.17	.20	.13	.24	.20	.22	.14	.27	.39	.33	.45	.40						
23	spurting	.39	.36	.39	.39	.34	.40	.36	.30	.45	.12	.16	.23	.19	.29	.27	.10	.22	.43	.42	.50	.32	.62					
24	throbbing	.19	.22	.23	.24	.23	.37	.36	.35	.34	.31	.32	.29	.22	.22	.30	.24	.34	.30	.33	.30	.28	.27	.37				
25	pulsating	.21	.18	.21	.19	.24	.31	.29	.35	.38	.38	.41	.36	.32	.30	.34	.27	.28	.24	.29	.24	.19	.23	.27	.59			
26	shuddering	.36	.22	.24	.25	.22	.30	.29	.32	.44	.27	.27	.32	.30	.27	.31	.19	.32	.31	.33	.34	.29	.35	.34	.42	.45		
27	trembling	.38	.32	.30	.34	.28	.36	.36	.34	.40	.27	.29	.36	.36	.38	.43	.18	.33	.35	.36	.37	.33	.29	.36	.42	.47	.68	
28	quivering	.36	.29	.28	.31	.28	.36	.37	.34	.45	.26	.25	.34	.32	.39	.41	.15	.36	.40	.38	.43	.31	.35	.41	.43	.48	.63	.83

Note. Correlation matrix for the 28 ORS items – pre-menopausal, solitary context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	close																											
2	loving	.38																										
3	passionate	.41	.69																									
4	tender	.26	.69	.61																								
5	unifying	.40	.71	.61	.67																							
6	ecstatic	.28	.54	.60	.46	.61																						
7	elated	.24	.48	.54	.50	.52	.78																					
8	euphoric	.17	.37	.44	.40	.31	.52	.60																				
9	rapturous	.27	.56	.61	.52	.58	.66	.70	.59																			
10	pleasurable	.03	.10	.15	.07	.05	.14	.15	.42	.19																		
11	satisfying	.13	.26	.29	.21	.18	.28	.30	.46	.27	.69																	
12	fulfilling	.23	.32	.34	.28	.27	.28	.30	.47	.32	.51	.73																
13	relaxing	.08	.30	.28	.30	.19	.25	.26	.38	.27	.48	.46	.38															
14	peaceful	.27	.39	.32	.27	.32	.24	.30	.31	.24	.28	.34	.52	.59														
15	soothing	.22	.31	.32	.26	.28	.23	.24	.34	.22	.39	.38	.49	.66	.78													
16	building	.13	-.04	.05	-.10	-.03	.01	-.01	.15	.07	.24	.22	.22	.08	.17	.20												
17	swelling	.22	.21	.39	.31	.24	.35	.31	.33	.33	.01	.18	.29	.09	.19	.27	.26											
18	flooding	.24	.25	.37	.32	.28	.41	.35	.41	.38	.04	.10	.22	.12	.17	.27	.22	.55										
19	flowing	.23	.31	.39	.36	.41	.48	.37	.39	.45	-.02	.14	.25	.10	.17	.22	.10	.41	.66									
20	flushing	.21	.22	.29	.22	.26	.29	.24	.23	.33	-.08	.04	.17	.04	.16	.18	.02	.32	.40	.58								
21	spreading	.16	.29	.32	.38	.21	.26	.25	.29	.26	.15	.19	.28	.18	.22	.26	.13	.39	.46	.36	.37							
22	shooting	.29	.32	.38	.33	.30	.40	.34	.37	.35	.02	.04	.14	.15	.19	.23	.11	.38	.54	.53	.47	.54						
23	spurting	.25	.35	.32	.39	.32	.40	.37	.38	.36	.05	.15	.28	.15	.28	.36	.13	.33	.54	.59	.45	.39	.54					
24	throbbing	.24	.12	.21	.16	.16	.22	.23	.30	.32	.18	.25	.27	.31	.20	.28	.17	.30	.22	.30	.29	.27	.34	.24				
25	pulsating	.15	.10	.15	.15	.11	.17	.26	.28	.19	.26	.30	.25	.31	.23	.34	.10	.32	.21	.17	.17	.20	.24	.13	.66			
26	shuddering	.19	.15	.27	.11	.15	.21	.20	.29	.31	.26	.31	.28	.20	.02	.21	.30	.19	.25	.21	.18	.25	.29	.22	.34	.33		
27	trembling	.29	.21	.37	.22	.25	.31	.31	.40	.37	.33	.36	.41	.18	.15	.23	.33	.17	.28	.21	.15	.30	.22	.27	.31	.34	.71	
28	quivering	.35	.23	.37	.22	.24	.32	.31	.41	.36	.29	.37	.35	.12	.06	.13	.37	.27	.27	.28	.26	.37	.34	.25	.28	.34	.62	.75

Note. Correlation matrix for the 28 ORS items – peri-menopausal, solitary context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	close																											
2	loving	.28																										
3	passionate	.29	.81																									
4	tender	.23	.78	.72																								
5	unifying	.26	.73	.75	.70																							
6	ecstatic	.30	.49	.62	.44	.51																						
7	elated	.32	.48	.57	.49	.57	.76																					
8	euphoric	.35	.34	.42	.28	.41	.67	.69																				
9	rapturous	.38	.44	.48	.41	.55	.63	.67	.65																			
10	pleasurable	.10	.16	.15	.07	.13	.28	.25	.34	.29																		
11	satisfying	.06	.17	.19	.11	.15	.33	.28	.37	.29	.81																	
12	fulfilling	.08	.30	.34	.24	.30	.43	.44	.44	.44	.65	.69																
13	relaxing	.08	.27	.26	.26	.19	.23	.21	.22	.19	.45	.44	.36															
14	peaceful	.13	.43	.33	.44	.31	.29	.35	.28	.36	.31	.30	.40	.65														
15	soothing	.12	.35	.27	.39	.23	.35	.39	.33	.34	.31	.29	.35	.60	.80													
16	building	.08	-.05	.01	-.08	-.03	.10	.15	.25	.14	.18	.13	.12	.14	.02	.07												
17	swelling	.26	.11	.17	.19	.15	.27	.29	.31	.32	.15	.16	.18	.08	.16	.19	.39											
18	flooding	.23	.17	.20	.19	.15	.34	.34	.35	.39	.17	.17	.19	.10	.19	.21	.25	.50										
19	flowing	.20	.27	.25	.23	.27	.26	.27	.27	.30	.15	.16	.17	.12	.18	.24	.18	.35	.63									
20	flushing	.24	.19	.14	.12	.19	.15	.18	.16	.22	.12	.09	.05	.15	.25	.24	.21	.34	.55	.51								
21	spreading	.23	.17	.20	.14	.23	.26	.32	.36	.29	.21	.19	.25	.17	.22	.25	.30	.38	.35	.31	.37							
22	shooting	.32	.20	.24	.21	.22	.43	.40	.43	.46	.15	.17	.19	.17	.26	.29	.21	.26	.41	.23	.34	.38						
23	spurting	.31	.34	.40	.32	.36	.35	.35	.31	.41	.13	.14	.18	.20	.27	.30	.00	.22	.38	.35	.37	.25	.61					
24	throbbing	.21	.10	.15	.16	.23	.33	.38	.40	.36	.34	.28	.34	.24	.24	.22	.23	.38	.33	.16	.22	.42	.32	.31				
25	pulsating	.18	.16	.14	.18	.18	.26	.32	.38	.30	.36	.32	.31	.17	.16	.15	.14	.41	.32	.25	.20	.38	.26	.22	.69			
26	shuddering	.22	.13	.10	.12	.15	.31	.32	.34	.29	.28	.25	.23	.15	.18	.19	.23	.30	.28	.20	.34	.43	.26	.21	.43	.46		
27	trembling	.20	.16	.19	.16	.16	.33	.36	.37	.35	.31	.31	.35	.12	.21	.24	.14	.32	.28	.24	.28	.40	.27	.19	.37	.43	.59	
28	quivering	.26	.16	.17	.14	.17	.31	.35	.41	.36	.31	.30	.29	.12	.22	.24	.18	.29	.33	.24	.35	.34	.27	.22	.41	.42	.57	.80

Note. Correlation matrix for the 28 ORS items – post-menopausal, solitary context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	close																											
2	loving	.25																										
3	passionate	.26	.73																									
4	tender	.27	.60	.53																								
5	unifying	.30	.57	.58	.66																							
6	ecstatic	.35	.43	.52	.52	.69																						
7	elated	.40	.35	.45	.49	.62	.77																					
8	euphoric	.33	.28	.40	.39	.57	.71	.73																				
9	rapturous	.31	.30	.39	.35	.55	.69	.69	.68																			
10	pleasurable	.18	.40	.52	.31	.37	.34	.32	.42	.26																		
11	satisfying	.19	.47	.66	.39	.45	.44	.38	.41	.29	.74																	
12	fulfilling	.26	.50	.65	.44	.41	.42	.38	.46	.30	.72	.79																
13	relaxing	.16	.40	.40	.35	.34	.31	.29	.32	.24	.44	.45	.51															
14	peaceful	.18	.43	.45	.49	.46	.45	.47	.43	.38	.33	.43	.49	.74														
15	soothing	.20	.43	.45	.44	.45	.43	.46	.41	.38	.30	.41	.44	.73	.89													
16	building	.23	.15	.18	.30	.37	.25	.27	.25	.23	.31	.19	.12	.06	.03	.01												
17	swelling	.26	.02	.06	.18	.21	.30	.37	.33	.27	.18	.11	.12	.12	.13	.13	.49											
18	flooding	.26	.20	.19	.25	.29	.39	.41	.45	.35	.18	.19	.25	.22	.31	.33	.30	.49										
19	flowing	.29	.25	.24	.29	.26	.41	.37	.38	.37	.20	.22	.27	.27	.26	.31	.25	.39	.72									
20	flushing	.28	.11	.13	.21	.22	.32	.29	.26	.32	.05	.09	.12	.12	.16	.20	.27	.36	.53	.53								
21	spreading	.32	.28	.20	.30	.30	.39	.37	.34	.35	.19	.20	.23	.18	.26	.29	.30	.33	.50	.48	.46							
22	shooting	.35	.24	.21	.27	.25	.38	.37	.34	.40	.09	.19	.18	.12	.21	.23	.09	.21	.35	.41	.46	.45						
23	spurting	.35	.21	.21	.29	.21	.39	.36	.28	.36	.07	.17	.21	.16	.25	.30	.11	.25	.49	.54	.50	.45	.62					
24	throbbing	.32	.16	.26	.27	.27	.36	.40	.44	.36	.42	.29	.33	.24	.23	.23	.36	.38	.32	.31	.23	.37	.32	.38				
25	pulsating	.23	.14	.24	.17	.27	.31	.30	.40	.32	.41	.32	.33	.20	.21	.20	.36	.37	.25	.24	.16	.27	.27	.27	.70			
26	shuddering	.29	.16	.33	.21	.29	.37	.31	.40	.33	.30	.24	.34	.18	.24	.22	.27	.27	.29	.21	.27	.31	.33	.36	.47	.55		
27	trembling	.34	.27	.44	.20	.26	.43	.39	.49	.42	.39	.37	.38	.25	.28	.30	.21	.21	.28	.24	.22	.35	.29	.31	.48	.51	.65	
28	quivering	.36	.24	.40	.25	.31	.41	.40	.51	.42	.38	.35	.42	.27	.27	.28	.19	.19	.29	.27	.24	.30	.30	.34	.47	.51	.67	.82

Note. Correlation matrix for the 28 ORS items – pre-menopausal, partnered context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	close																											
2	loving	.44																										
3	passionate	.39	.77																									
4	tender	.40	.86	.74																								
5	unifying	.38	.70	.65	.66																							
6	ecstatic	.38	.53	.58	.57	.63																						
7	elated	.42	.53	.59	.54	.56	.84																					
8	euphoric	.29	.46	.54	.44	.58	.69	.69																				
9	rapturous	.43	.36	.51	.41	.43	.63	.65	.72																			
10	pleasurable	.31	.51	.63	.50	.55	.46	.49	.51	.39																		
11	satisfying	.35	.58	.61	.54	.56	.43	.49	.52	.44	.82																	
12	fulfilling	.31	.58	.63	.55	.63	.47	.54	.58	.45	.81	.88																
13	relaxing	.34	.57	.61	.58	.54	.44	.50	.50	.46	.58	.66	.69															
14	peaceful	.38	.60	.59	.60	.53	.47	.47	.48	.42	.48	.54	.59	.74														
15	soothing	.50	.64	.65	.64	.55	.56	.58	.53	.51	.50	.56	.60	.72	.88													
16	building	.31	.37	.53	.38	.45	.27	.37	.43	.40	.43	.42	.44	.40	.28	.36												
17	swelling	.25	.22	.44	.28	.38	.42	.47	.57	.59	.32	.33	.36	.43	.30	.38	.66											
18	flooding	.29	.22	.37	.23	.34	.36	.43	.47	.41	.29	.27	.30	.32	.28	.32	.36	.47										
19	flowing	.38	.33	.37	.30	.37	.51	.53	.49	.51	.31	.29	.33	.34	.40	.47	.21	.37	.74									
20	flushing	.36	.22	.32	.29	.27	.38	.46	.42	.50	.22	.27	.30	.30	.31	.34	.09	.33	.56	.62								
21	spreading	.38	.33	.39	.34	.38	.35	.41	.35	.43	.35	.36	.34	.34	.25	.28	.35	.40	.48	.46	.54							
22	shooting	.34	.27	.36	.25	.33	.40	.46	.41	.43	.21	.27	.28	.35	.27	.33	.23	.30	.49	.48	.55	.55						
23	spurting	.26	.26	.30	.29	.31	.39	.39	.40	.40	.23	.16	.24	.26	.28	.32	.24	.31	.58	.62	.62	.49	.55					
24	throbbing	.40	.41	.49	.43	.44	.46	.48	.54	.49	.49	.46	.46	.48	.45	.46	.42	.46	.37	.40	.42	.44	.40	.45				
25	pulsating	.33	.46	.47	.46	.48	.41	.47	.54	.46	.45	.45	.45	.46	.46	.45	.44	.38	.32	.30	.31	.37	.27	.38	.77			
26	shuddering	.33	.33	.34	.33	.33	.44	.57	.52	.49	.36	.34	.36	.33	.33	.36	.40	.39	.36	.36	.41	.38	.36	.37	.57	.62		
27	trembling	.41	.38	.39	.35	.43	.49	.57	.59	.54	.37	.38	.38	.37	.34	.40	.42	.45	.37	.37	.41	.41	.39	.36	.62	.60	.83	
28	quivering	.43	.32	.41	.29	.36	.46	.57	.56	.59	.33	.33	.34	.31	.33	.42	.43	.45	.38	.41	.48	.42	.46	.40	.59	.56	.81	.92

Note. Correlation matrix for the 28 ORS items – peri-menopausal, partnered context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	close																											
2	loving	.28																										
3	passionate	.27	.65																									
4	tender	.27	.80	.63																								
5	unifying	.28	.74	.62	.72																							
6	ecstatic	.18	.42	.60	.49	.57																						
7	elated	.20	.41	.56	.47	.59	.89																					
8	euphoric	.22	.30	.56	.30	.45	.81	.80																				
9	rapturous	.15	.38	.53	.38	.46	.80	.74	.78																			
10	pleasurable	.14	.43	.60	.38	.45	.51	.47	.52	.44																		
11	satisfying	.14	.49	.55	.41	.46	.46	.50	.52	.43	.76																	
12	fulfilling	.19	.54	.53	.46	.52	.51	.53	.54	.48	.69	.87																
13	relaxing	.20	.40	.42	.45	.47	.38	.42	.38	.25	.55	.57	.54															
14	peaceful	.25	.49	.46	.57	.56	.47	.50	.39	.40	.44	.46	.52	.71														
15	soothing	.25	.54	.51	.59	.59	.52	.50	.41	.42	.47	.47	.53	.72	.90													
16	building	.23	.17	.27	.15	.29	.25	.29	.33	.24	.43	.40	.31	.35	.32	.32												
17	swelling	.35	.23	.28	.26	.33	.37	.37	.41	.40	.30	.28	.31	.22	.29	.30	.47											
18	flooding	.32	.29	.43	.28	.32	.45	.44	.40	.39	.27	.26	.26	.23	.28	.35	.27	.45										
19	flowing	.23	.36	.48	.37	.38	.44	.44	.38	.40	.32	.30	.31	.28	.35	.36	.24	.34	.65									
20	flushing	.31	.31	.38	.37	.40	.47	.49	.36	.46	.23	.20	.19	.20	.30	.33	.28	.43	.54	.54								
21	spreading	.22	.27	.44	.32	.34	.47	.44	.41	.39	.31	.22	.20	.31	.35	.38	.42	.41	.43	.50	.51							
22	shooting	.23	.25	.35	.23	.17	.37	.34	.32	.37	.25	.27	.28	.21	.30	.33	.25	.25	.52	.44	.39	.39						
23	spurting	.24	.23	.29	.26	.17	.34	.31	.26	.39	.19	.18	.23	.15	.24	.27	.05	.25	.43	.35	.36	.21	.54					
24	throbbing	.22	.09	.33	.17	.21	.41	.41	.47	.39	.33	.29	.30	.27	.26	.30	.29	.43	.35	.28	.34	.45	.37	.28				
25	pulsating	.26	.09	.36	.13	.23	.40	.39	.51	.41	.38	.34	.35	.33	.32	.38	.31	.49	.33	.28	.33	.40	.31	.25	.77			
26	shuddering	.19	.22	.32	.32	.34	.50	.47	.41	.46	.33	.30	.32	.18	.25	.26	.35	.40	.35	.26	.39	.38	.37	.25	.53	.43		
27	trembling	.15	.20	.35	.32	.27	.46	.48	.42	.38	.37	.39	.38	.30	.32	.34	.28	.37	.33	.27	.37	.36	.37	.31	.54	.45	.67	
28	quivering	.25	.28	.42	.29	.27	.52	.48	.45	.48	.42	.41	.43	.28	.36	.39	.35	.43	.41	.28	.43	.39	.39	.36	.50	.55	.61	.74

Note. Correlation matrix for the 28 ORS items – post-menopausal, partnered context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Increased heart rate																				
2	Heart beating stronger	.82																			
3	Faster breathing	.51	.57																		
4	Overall muscle tension	.43	.45	.43																	
5	Choppy/ shallow breathing	.31	.37	.45	.45																
6	Increased blood pressure	.44	.45	.38	.47	.49															
7	Hardening nipples	.26	.24	.19	.26	.13	.27														
8	Vulvar pulsation	.29	.32	.21	.35	.36	.36	.36													
9	Shivers/ goosebumps	.26	.28	.31	.27	.36	.34	.46	.44												
10	Anal contraction	.14	.26	.24	.29	.23	.27	.27	.35	.36											
11	Hypersensitive clitoris	.35	.36	.26	.27	.19	.32	.36	.33	.38	.24										
12	Clitoral pulsation	.32	.30	.24	.28	.19	.26	.31	.56	.40	.24	.69									
13	Lower limb spasms	.27	.32	.38	.38	.41	.37	.25	.40	.48	.42	.42	.42								
14	Abdominal contraction	.27	.29	.28	.39	.30	.29	.25	.37	.47	.43	.36	.38	.67							
15	Intracranial pressure	.23	.22	.18	.28	.37	.35	.18	.25	.42	.31	.23	.20	.42	.45						
16	Tightness in chest	.14	.24	.28	.17	.33	.37	.21	.27	.44	.43	.19	.17	.45	.43	.58					
17	Cranial pulsation/ headache	.11	.19	.13	.17	.26	.22	.14	.24	.33	.30	.14	.15	.31	.38	.59	.55				
18	Facial tingling	.16	.21	.20	.25	.31	.37	.29	.19	.40	.31	.15	.10	.32	.30	.46	.61	.50			
19	Reddening of skin or rash	.18	.22	.23	.22	.38	.42	.14	.21	.27	.26	.21	.18	.39	.27	.35	.45	.40	.42		
20	Sweating	.15	.21	.33	.24	.35	.27	.20	.23	.46	.24	.17	.20	.36	.30	.30	.38	.25	.31	.40	
21	Hot flashes	.24	.28	.26	.28	.33	.35	.19	.24	.34	.22	.05	.12	.25	.22	.38	.44	.47	.38	.42	.52

Note. Correlation matrix for the 21 BSOS items – pre-menopausal, solitary context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Increased heart rate																				
2	Heart beating stronger	.88																			
3	Faster breathing	.65	.59																		
4	Overall muscle tension	.53	.52	.56																	
5	Choppy/ shallow breathing	.59	.58	.56	.62																
6	Increased blood pressure	.57	.62	.57	.39	.62															
7	Hardening nipples	.36	.41	.45	.34	.39	.40														
8	Vulvar pulsation	.38	.43	.36	.44	.42	.42	.49													
9	Shivers/ goosebumps	.38	.42	.49	.36	.46	.54	.54	.56												
10	Anal contraction	.16	.27	.36	.32	.25	.22	.51	.41	.52											
11	Hypersensitive clitoris	.33	.33	.32	.31	.32	.26	.37	.40	.37	.15										
12	Clitoral pulsation	.33	.36	.42	.33	.31	.33	.45	.55	.50	.35	.70									
13	Lower limb spasms	.37	.35	.46	.47	.44	.37	.28	.37	.49	.33	.37	.47								
14	Abdominal contraction	.36	.37	.39	.44	.45	.34	.31	.40	.47	.35	.40	.39	.69							
15	Intracranial pressure	.36	.40	.22	.29	.40	.42	.25	.34	.33	.20	.31	.29	.30	.47						
16	Tightness in chest	.36	.40	.42	.33	.42	.54	.31	.23	.45	.26	.19	.25	.34	.35	.43					
17	Cranial pulsation/ headache	.26	.34	.23	.26	.40	.44	.16	.23	.32	.28	.13	.18	.32	.46	.73	.60				
18	Facial tingling	.26	.30	.32	.23	.35	.43	.30	.22	.43	.29	.30	.28	.33	.38	.40	.48	.53			
19	Reddening of skin or rash	.24	.22	.38	.27	.31	.37	.25	.23	.39	.32	.19	.26	.29	.28	.43	.47	.50	.49		
20	Sweating	.19	.20	.38	.22	.27	.40	.35	.19	.41	.32	.09	.15	.29	.30	.29	.42	.42	.46	.59	
21	Hot flashes	.19	.21	.40	.27	.25	.37	.42	.29	.45	.44	.12	.16	.30	.33	.33	.42	.51	.44	.62	.74

Note. Correlation matrix for the 21 BSOS items – peri-menopausal, solitary context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Increased heart rate																				
2	Heart beating stronger	.87																			
3	Faster breathing	.70	.66																		
4	Overall muscle tension	.52	.57	.58																	
5	Choppy/ shallow breathing	.50	.49	.57	.47																
6	Increased blood pressure	.56	.58	.48	.43	.53															
7	Hardening nipples	.26	.28	.34	.25	.22	.22														
8	Vulvar pulsation	.38	.40	.39	.39	.41	.35	.47													
9	Shivers/ goosebumps	.29	.30	.44	.38	.27	.37	.31	.44												
10	Anal contraction	.07	.11	.09	.11	.19	.08	.31	.30	.15											
11	Hypersensitive clitoris	.27	.28	.34	.35	.25	.26	.31	.38	.36	.13										
12	Clitoral pulsation	.27	.28	.34	.36	.27	.28	.32	.61	.39	.17	.67									
13	Lower limb spasms	.30	.32	.35	.39	.30	.22	.26	.32	.39	.19	.31	.40								
14	Abdominal contraction	.28	.34	.30	.37	.28	.14	.20	.24	.17	.33	.29	.25	.52							
15	Intracranial pressure	.35	.38	.15	.28	.28	.33	.15	.13	.14	.14	.10	.09	.24	.18						
16	Tightness in chest	.40	.39	.17	.21	.27	.35	.02	.11	.17	.04	.14	.11	.18	.19	.69					
17	Cranial pulsation/ headache	.31	.32	.10	.22	.15	.30	.12	.16	.20	.10	.13	.16	.16	.15	.78	.74				
18	Facial tingling	.15	.14	.08	.11	.20	.21	.06	.15	.23	.30	.12	.13	.28	.18	.26	.40	.31			
19	Reddening of skin or rash	.37	.35	.33	.15	.41	.41	.16	.17	.21	.12	.10	.14	.28	.17	.33	.42	.24	.43		
20	Sweating	.34	.36	.17	.19	.32	.43	.07	.15	.16	.09	.10	.07	.21	.16	.41	.50	.38	.26	.41	
21	Hot flashes	.29	.33	.16	.15	.21	.43	.03	.07	.09	.04	.10	.04	.20	.19	.38	.64	.53	.39	.32	.56

Note. Correlation matrix for the 21 BSOS items – post-menopausal, solitary context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Increased heart rate																				
2	Heart beating stronger	.77																			
3	Faster breathing	.66	.54																		
4	Overall muscle tension	.42	.40	.43																	
5	Choppy/ shallow breathing	.45	.39	.47	.40																
6	Increased blood pressure	.54	.49	.45	.48	.55															
7	Hardening nipples	.32	.37	.44	.29	.30	.34														
8	Vulvar pulsation	.38	.41	.37	.34	.44	.38	.49													
9	Shivers/ goosebumps	.38	.39	.38	.31	.43	.44	.45	.53												
10	Anal contraction	.23	.29	.25	.36	.37	.33	.25	.38	.33											
11	Hypersensitive clitoris	.34	.31	.40	.27	.20	.25	.31	.36	.30	.15										
12	Clitoral pulsation	.31	.33	.31	.26	.15	.15	.27	.50	.32	.18	.65									
13	Lower limb spasms	.37	.33	.31	.36	.38	.36	.32	.49	.45	.28	.33	.37								
14	Abdominal contraction	.26	.30	.24	.48	.31	.35	.25	.37	.43	.43	.26	.33	.59							
15	Intracranial pressure	.21	.18	.17	.24	.26	.37	.12	.26	.28	.35	.12	.09	.37	.35						
16	Tightness in chest	.15	.15	.14	.13	.22	.27	.08	.15	.28	.35	.03	.03	.27	.33	.61					
17	Cranial pulsation/ headache	.14	.12	.12	.18	.14	.25	.06	.18	.20	.28	.07	.04	.23	.20	.64	.59				
18	Facial tingling	.15	.11	.19	.20	.31	.31	.13	.20	.33	.39	.08	.07	.36	.37	.51	.59	.40			
19	Reddening of skin or rash	.23	.20	.20	.25	.34	.39	.13	.17	.22	.34	.12	.08	.20	.23	.37	.42	.38	.37		
20	Sweating	.45	.35	.44	.30	.41	.43	.29	.35	.45	.33	.25	.22	.38	.37	.39	.37	.35	.32	.34	
21	Hot flashes	.23	.19	.20	.21	.34	.34	.23	.34	.38	.44	.12	.10	.35	.34	.49	.51	.47	.47	.36	.60

Note. Correlation matrix for the 21 BSOS items – pre-menopausal, partnered context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Increased heart rate																				
2	Heart beating stronger	.90																			
3	Faster breathing	.64	.72																		
4	Overall muscle tension	.51	.51	.58																	
5	Choppy/ shallow breathing	.50	.49	.60	.56																
6	Increased blood pressure	.53	.58	.55	.46	.69															
7	Hardening nipples	.41	.46	.51	.45	.50	.40														
8	Vulvar pulsation	.41	.44	.53	.47	.50	.52	.70													
9	Shivers/ goosebumps	.54	.56	.50	.42	.40	.56	.56	.62												
10	Anal contraction	.32	.36	.39	.29	.44	.42	.49	.46	.46											
11	Hypersensitive clitoris	.39	.38	.43	.30	.33	.31	.48	.52	.49	.33										
12	Clitoral pulsation	.37	.38	.43	.31	.40	.39	.55	.66	.58	.40	.78									
13	Lower limb spasms	.43	.43	.43	.43	.45	.39	.41	.45	.58	.42	.45	.59								
14	Abdominal contraction	.37	.38	.47	.38	.46	.37	.42	.39	.48	.47	.38	.48	.64							
15	Intracranial pressure	.27	.26	.19	.23	.31	.38	.31	.37	.44	.26	.26	.26	.34	.35						
16	Tightness in chest	.30	.33	.34	.31	.46	.55	.26	.32	.40	.22	.24	.30	.35	.44	.59					
17	Cranial pulsation/ headache	.31	.30	.22	.24	.35	.42	.23	.25	.33	.23	.20	.21	.31	.30	.80	.69				
18	Facial tingling	.38	.42	.47	.29	.50	.51	.33	.36	.43	.19	.34	.42	.36	.31	.37	.55	.49			
19	Reddening of skin or rash	.28	.28	.30	.29	.32	.35	.22	.27	.39	.13	.30	.25	.33	.32	.48	.50	.48	.62		
20	Sweating	.33	.33	.42	.32	.39	.37	.34	.31	.34	.28	.29	.26	.34	.36	.12	.20	.18	.44	.48	
21	Hot flashes	.12	.17	.32	.23	.34	.37	.20	.27	.27	.13	.22	.23	.18	.18	.25	.39	.24	.55	.55	.49

Note. Correlation matrix for the 21 BSOS items – peri-menopausal, partnered context

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Increased heart rate																				
2	Heart beating stronger	.89																			
3	Faster breathing	.72	.70																		
4	Overall muscle tension	.58	.62	.48																	
5	Choppy/ shallow breathing	.45	.46	.51	.53																
6	Increased blood pressure	.50	.55	.51	.47	.63															
7	Hardening nipples	.36	.35	.48	.27	.35	.33														
8	Vulvar pulsation	.41	.39	.44	.46	.43	.35	.58													
9	Shivers/ goosebumps	.33	.42	.38	.39	.34	.41	.42	.54												
10	Anal contraction	.26	.28	.28	.33	.28	.26	.38	.30	.32											
11	Hypersensitive clitoris	.37	.36	.36	.44	.36	.38	.45	.50	.42	.34										
12	Clitoral pulsation	.38	.41	.41	.46	.40	.36	.38	.69	.51	.30	.71									
13	Lower limb spasms	.45	.51	.34	.52	.35	.30	.29	.40	.47	.28	.47	.52								
14	Abdominal contraction	.51	.52	.42	.49	.38	.27	.32	.38	.26	.39	.36	.40	.61							
15	Intracranial pressure	.34	.40	.24	.34	.37	.34	.17	.17	.18	.13	.12	.17	.37	.34						
16	Tightness in chest	.37	.42	.31	.27	.37	.38	.12	.19	.27	.13	.15	.26	.33	.35	.69					
17	Cranial pulsation/ headache	.31	.37	.22	.31	.37	.34	.08	.16	.15	.09	.14	.21	.34	.30	.78	.77				
18	Facial tingling	.33	.36	.24	.33	.33	.38	.15	.19	.23	.09	.11	.23	.22	.23	.53	.54	.50			
19	Reddening of skin or rash	.31	.31	.26	.26	.31	.37	.23	.21	.22	.15	.10	.14	.17	.31	.37	.53	.39	.58		
20	Sweating	.40	.38	.32	.26	.36	.32	.31	.31	.34	.11	.29	.29	.27	.29	.31	.43	.40	.23	.36	
21	Hot flashes	.27	.27	.20	.23	.19	.28	.13	.12	.19	.13	.21	.25	.22	.32	.45	.56	.53	.33	.41	.59

Note. Correlation matrix for the 21 BSOS items – post-menopausal, partnered context

Appendix K

Final Factor Structures with Items for the ORS and BSOS

Final Factor Structures with Items for the ORS and BSOS

Factors	Items
Cognitive-affective dimension	
Emotional intimacy	loving, passionate, tender, unifying
Ecstasy	ecstatic, elated, euphoric, rapturous
Pleasurable satisfaction	pleasurable, satisfying, fulfilling
Relaxation	relaxing, peaceful, soothing
Sensory dimension	
Building sensations	building, swelling
Flooding sensations	flooding, flowing
Flushing sensations	flushing, spreading
Shooting sensations	shooting, spurting
Throbbing sensations	throbbing, pulsating
General spasms	shuddering, trembling, quivering

Note. ORS final ten-factor structure with associated items for all menopausal status groups and sexual contexts.

Factors	Items
Extragenital sensations	increased heart rate, heart beating stronger, faster breathing, overall muscle tension, choppy/shallow breathing, increased blood pressure
Genital sensations and spasms	hardening nipples, vulvar pulsation, shivers/goosebumps, hypersensitive clitoris, clitoral pulsation, lower limb spasms
Nociceptive sensations and sweating responses	intracranial pressure, tightness in chest, cranial pulsation/headache, facial tingling, reddening of skin or rash, sweating, hot flashes

Note. BSOS final three-factor structure with associated items for all menopausal status groups and sexual contexts.

Appendix L

Internal Consistency Tables for the ORS and BSOS

Internal Consistency Tables for the ORS and BSOS

	Solitary						Partnered					
	Pre		Peri		Post		Pre		Peri		Post	
	α	α if deleted	α	α if deleted	α	α if deleted	α	α if deleted	α	α if deleted	α	α if deleted
Total Scale	.94	--	.92	--	.92	--	.93	--	.96	--	.95	--
Emotional Intimacy	.88	.85	.85	.81	.86	.81	.86	.85	.91	.89	.90	.88
Loving		.83		.79		.79		.81		.86		.85
Passionate		.85		.80		.80		.82		.89		.90
Tender		.84		.82		.81		.83		.87		.86
Unifying		.84		.80		.81		.83		.91		.87
Ecstasy	.89	.84	.88	.81	.89	.81	.91	.83	.90	.89	.94	.87
Ecstatic		.83		.83		.86		.87		.87		.91
Elated		.84		.81		.85		.87		.86		.92
Euphoric		.86		.88		.87		.88		.87		.93
Rapturous		.88		.84		.88		.89		.89		.94
Pleasurable Satisfaction	.84	.85	.83	.83	.86	.82	.90	.85	.93	.90	.91	.88
Pleasurable		.79		.83		.79		.88		.92		.91
Satisfying		.70		.66		.75		.83		.88		.80
Fulfilling		.86*		.81		.89*		.85		.90		.86
Relaxation	.89	.85	.86	.83	.87	.82	.92	.86	.91	.90	.91	.88
Relaxing		.91*		.87*		.89*		.94*		.94*		.95*
Peaceful		.83		.79		.74		.84		.83		.83
Soothing		.80		.73		.77		.84		.85		.83
Building Sensations	.68	.86	.41	.83	.56	.82	.65	.86	.79	.90	.64	.88
Building		--		--		--		--		--		--
Swelling		--		--		--		--		--		--
Flooding Sensations	.79	.85	.79	.82	.77	.81	.84	.84	.85	.90	.79	.88

Flooding		--		--		--		--		--		--
Flowing		--		--		--		--		--		--
Flushing Sensations	.64	.86	.54	.82	.54	.81	.63	.84	.70	.90	.67	.87
Flushing Spreading		--		--		--		--		--		--
		--		--		--		--		--		--
Shooting Sensations	.77	.86	.70	.82	.76	.81	.77	.85	.71	.90	.70	.88
Shooting Spurting		--		--		--		--		--		--
		--		--		--		--		--		--
Throbbing Sensations	.74	.86	.79	.83	.81	.81	.82	.85	.87	.89	.87	.88
Throbbing Pulsating		--		--		--		--		--		--
		--		--		--		--		--		--
General Spasms	.88	.85	.87	.82	.85	.81	.88	.84	.95	.90	.86	.87
Shuddering		.91*		.86		.89*		.90*		.96*		.85
Trembling		.78		.77		.73		.80		.89		.76
Quivering		.81		.83		.74		.79		.91		.81

Note. Internal consistency for the Orgasm Rating Scale (ORS) * would improve Cronbach's alpha if removed. Sample sizes for pre- (252;229), peri- (139;136), and post-menopausal (190;194) women in the solitary and partnered contexts, respectively.

	Solitary						Partnered					
	Pre		Peri		Post		Pre		Peri		Post	
	α	α if deleted	α	α if deleted	α	α if deleted	α	α if deleted	α	α if deleted	α	α if deleted
Total Scale	.90	--	.91	--	.89	--	.89	--	.92	--	.92	--
Extragenital Sensations	.84	.66	.88	.61	.88	.43	.84	.56	.88	.64	.89	.55
Increased heart rate		.81		.85		.85		.80		.85		.85
Heart beating stronger		.80		.85		.84		.81		.84		.85
Faster breathing		.81		.86		.85		.81		.85		.86
Overall muscle tension		.82		.88		.87		.83		.87		.87
Choppy/ shallow breathing		.82		.87		.87		.83		.86		.88
Increased blood pressure		.82		.87		.87		.81		.86		.87
Genital Sensations and Spasms	.81	.64	.83	.65	.80	.59	.79	.62	.87	.68	.85	.69
Hardening nipples		.80		.82		.80		.77		.86		.84
Vulvar pulsation		.77		.80		.75		.73		.85		.81
Shivers/ goosebumps		.77		.79		.77		.76		.85		.83
Hypersensitive clitoris		.77		.81		.77		.77		.86		.82
Clitoral pulsation		.76		.78		.75		.75		.84		.80
Lower limb spasms		.78		.82		.79		.76		.87		.84
Nociceptive Sensations and Sweating Responses	.84	.66	.85	.75	.84	.73	.85	.75	.83	.77	.86	.80
Intracranial pressure		.82		.85		.81		.82		.81		.83
Tightness in chest		.80		.84		.79		.81		.80		.81
Cranial pulsation/ headache		.81		.82		.80		.82		.81		.82
Facial tingling		.82		.84		.83		.83		.80		.84
Reddening of skin or rash		.82		.83		.83		.85		.79		.84
Sweating		.84		.84		.83		.84		.85*		.87*
Hot flashes		.82		.82		.81		.82		.81		.83

Note. Internal consistency for the Bodily Sensations of Orgasm Scale (BSOS) * would improve Cronbach's alpha if removed. Sample sizes for pre- (238; 216), peri- (139; 137), and post-menopausal (187; 192) women in the solitary and partnered contexts, respectively.

Appendix M

Descriptive Statistics for the ORS and BSOS by Menopausal Status and Sexual Context

Descriptive Statistics for the ORS and BSOS by Menopausal Status and Sexual Context

	No. of items	M (SD)		Skewness (Std. error)		Kurtosis (Std. error)	
		1	2	1	2	1	2
Pre-menopausal							
Emotional Intimacy	4	2.30 (1.51)	4.30 (1.42)	.95 (.15)	-.63 (.16)	-.26 (.31)	-.48 (.32)
Ecstasy	4	3.10 (1.56)	3.79 (1.59)	.21 (.15)	-.26 (.16)	-1.06 (.31)	-1.12 (.32)
Pleasurable Satisfaction	3	4.87 (1.17)	5.23 (1.03)	-1.07 (.15)	-1.69 (.16)	.63 (.31)	2.95 (.32)
Relaxation	3	3.97 (1.62)	4.15 (1.63)	-.32 (.15)	-.43 (.16)	-1.11 (.31)	-1.06 (.32)
Building Sensations	2	3.78 (1.48)	3.89 (1.48)	-.31 (.15)	-.35 (.16)	-.75 (.31)	-.72 (.32)
Flooding Sensations	2	2.73 (1.61)	3.13 (1.70)	.55 (.15)	.27 (.16)	-.88 (.31)	-1.17 (.32)
Flushing Sensations	2	2.91 (1.46)	3.14 (1.55)	.28 (.15)	.24 (.16)	-.83 (.31)	-.91 (.32)
Shooting Sensations	2	2.31(1.46)	2.56 (1.59)	.95 (.15)	.71 (.16)	-.10 (.31)	-.71 (.32)
Throbbing Sensations	2	4.16 (1.52)	4.17 (1.57)	-.56 (.15)	-.52 (.16)	-.70 (.31)	-.86 (.32)
General Spasms	3	3.61 (1.68)	4.12 (1.60)	-.07 (.15)	-.45 (.16)	-1.25 (.31)	-.98 (.32)
Total ORS Scale Score	27	3.37 (1.03)	3.85 (1.01)	.16 (.15)	-.14 (.16)	-.44 (.31)	-.26 (.32)
Peri-menopausal							
Emotional Intimacy	4	2.09 (1.32)	4.51 (1.41)	1.12 (.21)	-.72 (.21)	.24 (.41)	-.65 (.41)
Ecstasy	4	2.88 (1.44)	3.62 (1.58)	.40 (.21)	-.09 (.21)	-.86 (.41)	-1.19 (.41)
Pleasurable Satisfaction	3	4.95 (1.10)	5.22 (1.07)	-1.14 (.21)	-1.39 (.21)	1.08 (.41)	.95 (.41)
Relaxation	3	3.92 (1.50)	4.07 (1.59)	-.29 (.21)	-.40 (.21)	-.87 (.41)	-1.00 (.41)
Building Sensations	2	3.82 (1.24)	4.05 (1.43)	-.10 (.21)	-.49 (.21)	-.26 (.41)	-.51 (.41)
Flooding Sensations	2	2.60 (1.48)	2.94 (1.67)	.62 (.21)	.42 (.21)	-.73 (.41)	-1.04 (.41)
Flushing Sensations	2	2.73 (1.35)	2.81 (1.50)	.26 (.21)	.48 (.21)	-.92 (.41)	-.82 (.41)
Shooting Sensations	2	2.20 (1.46)	2.35 (1.48)	.95 (.21)	.91 (.21)	-.26 (.41)	-.16 (.41)
Throbbing Sensations	2	4.26 (1.46)	4.12 (1.54)	-.56 (.21)	-.52 (.21)	-.65 (.41)	-.71 (.41)
General Spasms	3	3.47 (1.57)	3.58 (1.82)	-.01 (.21)	-.09 (.21)	-1.16 (.41)	-1.48 (.41)
Total ORS Scale Score	27	3.29 (.91)	3.73 (1.12)	.21 (.21)	-.01 (.21)	-.41 (.41)	-.78 (.41)
Post-menopausal							
Emotional Intimacy	4	2.33 (1.52)	4.17 (1.50)	.93 (.18)	-.62 (.17)	-.32 (.35)	-.65 (.35)
Ecstasy	4	3.07 (1.62)	3.46 (1.69)	.27 (.18)	.05 (.17)	-1.20 (.35)	-1.26 (.35)
Pleasurable Satisfaction	3	4.94 (1.17)	4.96 (1.26)	-1.18 (.18)	-1.47 (.17)	1.00 (.35)	1.58 (.35)

Relaxation	3	4.19 (1.49)	3.95 (1.57)	-.44 (.18)	-.35 (.17)	-.98 (.35)	-.97 (.35)
Building Sensations	2	3.81 (1.36)	3.79 (1.45)	-.34 (.18)	-.27 (.17)	-.62 (.35)	-.76 (.35)
Flooding Sensations	2	2.69 (1.50)	2.69 (1.48)	.54 (.18)	.56 (.17)	-.81 (.35)	-.64 (.35)
Flushing Sensations	2	2.92 (1.41)	3.03 (1.50)	.36 (.18)	.25 (.17)	-.61 (.35)	-.91 (.35)
Shooting Sensations	2	2.29 (1.48)	2.30 (1.36)	.88 (.18)	.87 (.17)	-.40 (.35)	-.08 (.35)
Throbbing Sensations	2	4.03 (1.56)	4.19 (1.62)	-.36 (.18)	-.54 (.17)	-1.03 (.35)	-.89 (.35)
General Spasms	3	3.56 (1.56)	3.66 (1.60)	-.18 (.18)	-.04 (.17)	-1.05 (.35)	-1.17 (.35)
Total ORS Scale Score	27	3.38 (.94)	3.62 (1.06)	.23 (.18)	-.18 (.17)	-.16 (.35)	-.50 (.35)

Note. Descriptive statistics for the Orgasm Rating Scale by menopausal status and sexual context. Sample sizes for pre- (252; 229), peri- (139; 136), and post-menopausal (190; 194) women in the solitary (1) and partnered (2) contexts, respectively.

	No. of items	M (SD)		Skewness (Std. error)		Kurtosis (Std. error)	
		1	2	1	2	1	2
Pre-menopausal							
Extragenital Sensations	6	3.17 (.87)	3.55 (.84)	-.26 (.15)	-.35 (.16)	-.22 (.31)	-.18 (.32)
Genital Sensations and Spasms	6	3.09 (.95)	3.43 (.92)	.20 (.15)	-.28 (.16)	-.71 (.31)	-.31 (.32)
Nociceptive Sensations and Sweating Responses	7	1.77 (.79)	2.00 (.88)	1.35 (.15)	1.03 (.16)	1.67 (.31)	.49 (.32)
Total BSOS Scale Score	19	2.68 (.72)	3.00 (.71)	.25 (.15)	.07 (.16)	.08 (.31)	.00 (.32)
Peri-menopausal							
Extragenital Sensations	6	2.82 (.93)	3.18 (.92)	.53 (.21)	.17 (.21)	-.31 (.41)	-.56 (.41)
Genital Sensations and Spasms	6	2.86 (.96)	3.19 (1.05)	.27 (.21)	.08 (.21)	-.56 (.41)	-.96 (.41)
Nociceptive Sensations and Sweating Responses	7	1.52 (.70)	1.73 (.74)	2.39 (.21)	1.94 (.21)	7.19 (.41)	4.64 (.41)
Total BSOS Scale Score	19	2.40 (.72)	2.70 (.76)	1.02 (.21)	.66 (.21)	1.25 (.41)	.06 (.41)
Post-menopausal							
Extragenital Sensations	6	2.75 (.85)	2.94 (.90)	.16 (.18)	-.07 (.18)	-.36 (.35)	-.37 (.35)
Genital Sensations and Spasms	6	2.85 (.89)	3.10 (1.00)	-.04 (.18)	-.12 (.18)	-.76 (.35)	-.76 (.35)
Nociceptive Sensations and Sweating Responses	7	1.40 (.59)	1.61 (.73)	2.66 (.18)	2.05 (.18)	8.62 (.35)	4.76 (.35)
Total BSOS Scale Score	19	2.33 (.62)	2.55 (.73)	.49 (.18)	.27 (.18)	.36 (.35)	.06 (.35)

Note. Descriptive statistics for the Bodily Sensations of Orgasm Scale by menopausal status and sexual context. Sample sizes for pre- (238; 216), peri- (139; 137), and post-menopausal (187; 192) women in the solitary (1) and partnered (2) contexts, respectively.

Appendix N

Convergent Validity between the ORS and BSOS by Menopausal Status

Convergent Validity between the ORS and BSOS by Menopausal Status

	Solitary				Partnered			
	Total BSOS Score	Extra-genital Sens	Genital Sens and Spasm	Noci-ceptive Sens and Sweat Resp	Total BSOS Score	Extra-genital Sens	Genital Sens and Spasm	Noci-ceptive Sens and Sweat Resp
Total ORS Score	.18**	.18**	.09	.17**	.69**	.57**	.68**	.41
Cognitive-Affective	.08	.05	.01	.14*	.57**	.47**	.59**	.30
Emotional Intimacy	.07	.02	.00	.18**	.47**	.38**	.47**	.27
Ecstasy	.07	.11	.01	.06	.55**	.45**	.50**	.36
Pleasurable Satisfaction	.02	.02	-.03	.07	.44**	.46**	.53**	.06
Relaxation	.08	.02	.05	.13*	.38**	.25**	.43**	.22
Sensory	.22**	.25**	.13*	.16*	.65**	.54**	.61**	.40
Building Sensations	.04	.04	.03	.02	.37**	.36**	.37**	.16
Flooding Sensations	.22**	.21**	.15*	.18**	.41**	.36**	.36**	.27
Flushing Sensations	.26**	.24**	.15*	.25**	.50**	.37**	.41**	.42
Shooting Sensations	.21**	.24**	.13*	.15*	.53**	.38**	.43**	.46
Throbbing Sensations	.14*	.20**	.07	.08	.46**	.41**	.53**	.16
General Spasms	.09	.15*	.04	.03	.55**	.47**	.56**	.28

Note. Pre-menopause. Convergent validity between the ORS and BSOS *indicates a significant Pearson's correlation ($p \leq .05$); ** indicates a significant Pearson's correlation ($p \leq .01$). Correlation of <.3 insufficient, >.3 to <.5 weak, and >.5 adequate convergence (Zhu et al., 2025)

	Solitary				Partnered			
	Total BSOS Score	Extra-genital Sens	Genital Sens and Spasm	Noci-ceptive Sens and Sweat Resp	Total BSOS Score	Extra-genital Sens	Genital Sens and Spasm	Noci-ceptive Sens and Sweat Resp
Total ORS Score	.43**	.33**	.45**	.26**	.73**	.59**	.77**	.44**
Cognitive-Affective	.26**	.19*	.28**	.15	.60**	.46**	.65**	.50
Emotional Intimacy	.29**	.20*	.27**	.25**	.48**	.37**	.55**	.25**
Ecstasy	.21*	.13	.24**	.13	.62**	.50**	.63**	.41**
Pleasurable Satisfaction	.06	.05	.07	.01	.43**	.31**	.53**	.18*
Relaxation	.21*	.19*	.26**	.05	.49**	.37**	.53**	.29**
Sensory	.47**	.37**	.49**	.29**	.73**	.59**	.75**	.46**
Building Sensations	.25**	.23**	.25**	.12	.58**	.47**	.62**	.34**
Flooding Sensations	.43**	.33**	.45**	.29**	.51**	.42**	.45**	.39**
Flushing Sensations	.45**	.36**	.42**	.33**	.55**	.44**	.55**	.37**
Shooting Sensations	.39**	.31**	.36**	.29**	.51**	.42**	.49**	.36**
Throbbing Sensations	.18*	.06	.29**	.07	.59**	.44**	.67**	.32**
General Spasms	.30**	.27**	.31**	0.13	.62**	.53**	.66**	.33**

Note. Peri-menopause. Convergent validity between the ORS and BSOS *indicates a significant Pearson's correlation ($p \leq .05$); ** indicates a significant Pearson's correlation ($p \leq .01$). Correlation of <.3 insufficient, >.3 to <.5 weak, and >.5 adequate convergence (Zhu et al., 2025)

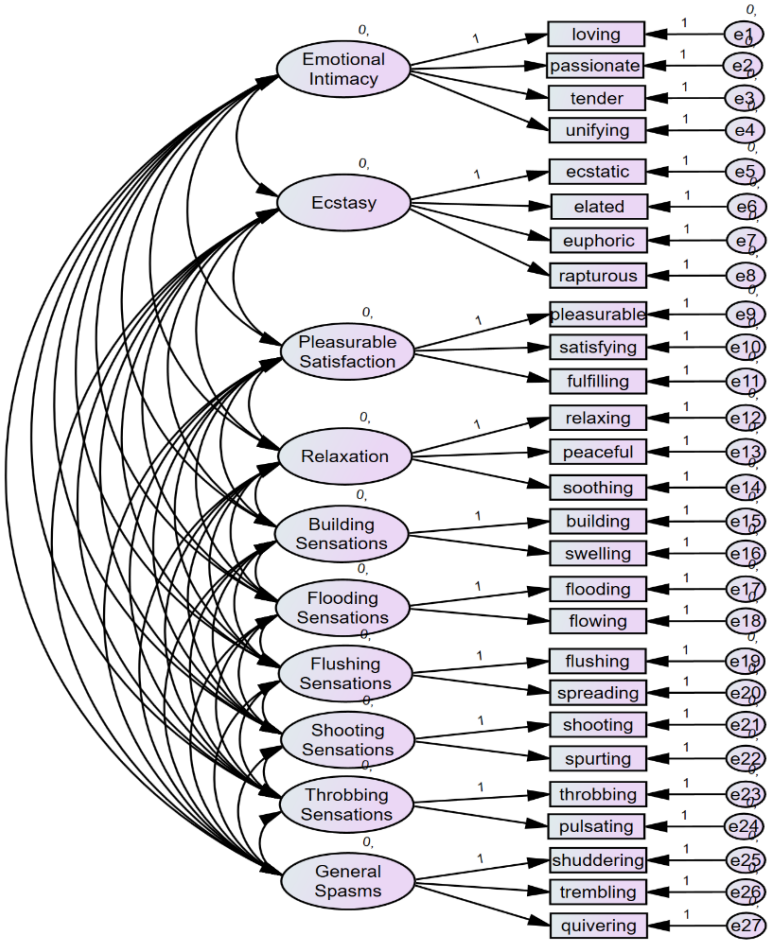
	Total BSOS Score	Extra-genital Sens	Genital Sens and Spasm	Noci-ceptive Sens and Sweat Resp	Total BSOS Score	Extra-genital Sens	Genital Sens and Spasm	Noci-ceptive Sens and Sweat Resp
Total ORS Score	.20**	.07	.26**	.13	.69**	.55**	.75**	.38**
Cognitive-Affective	.02	-.06	.08	.03	.51**	.41**	.61**	.21**
Emotional Intimacy	-.07	-0.1	-.03	-.03	.40**	.32**	.45**	.17*
Ecstasy	.09	.01	.11	.09	.52**	.38**	.60**	.27**
Pleasurable Satisfaction	.04	-.05	.11	.01	.44**	.38**	.55**	.11
Relaxation	.00	-.05	.05	.00	.34**	.29**	.42**	.10
Sensory	.29**	.15*	.34**	.18*	.71**	.56**	.73**	.45**
Building Sensations	.18*	.09	.26**	.06	.45**	.36**	.52**	.20**
Flooding Sensations	.18*	.07	.21**	.16*	.56**	.45**	.51**	.44**
Flushing Sensations	.32**	.18*	.35**	.23**	.53**	.42**	.53**	.34**
Shooting Sensations	.15*	.08	.14	.16*	.51**	.40**	.46**	.40**
Throbbing Sensations	.16*	.08	.22**	.07	.54**	.41**	.60**	.31**
General Spasms	.22**	.14	.27**	.09	.57**	.46**	.61**	.30**

Note. Post-menopause. Convergent validity between the ORS and BSOS *indicates a significant Pearson's correlation ($p \leq .05$); ** indicates a significant Pearson's correlation ($p \leq .01$). Correlation of <.3 insufficient, >.3 to <.5 weak, and >.5 adequate convergence (Zhu et al., 2025)

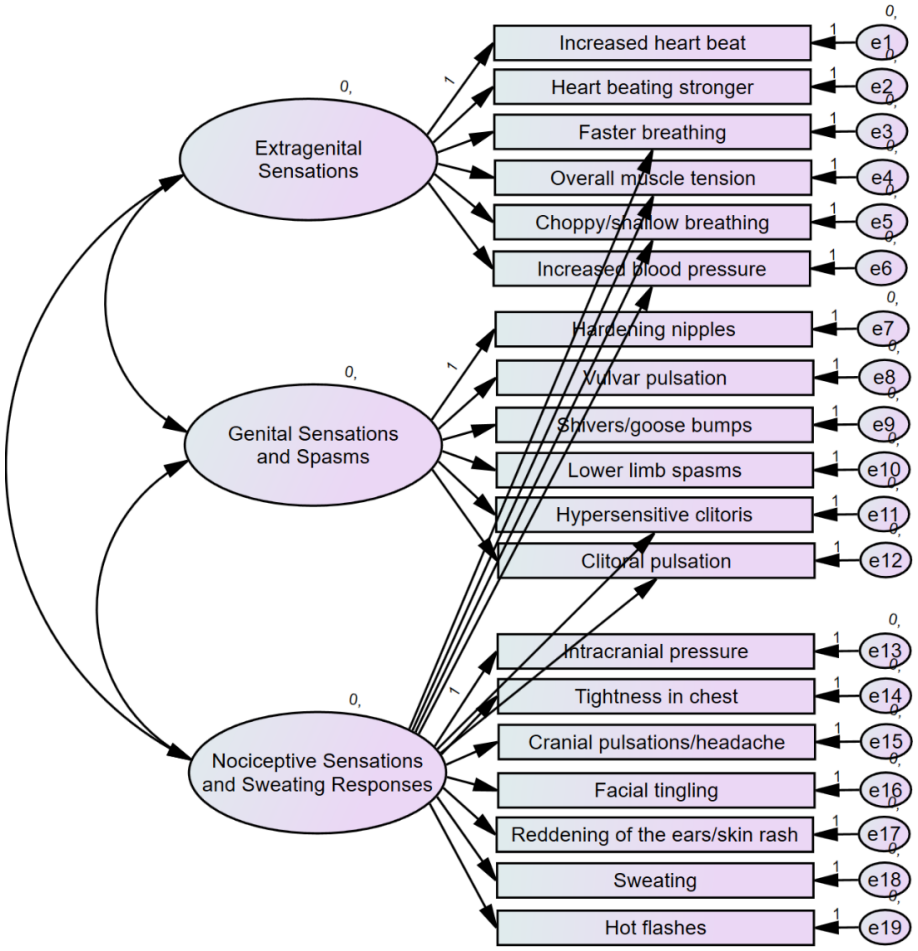
Appendix O

Multi-Group Confirmatory Factor Analysis Models for the ORS and BSOS

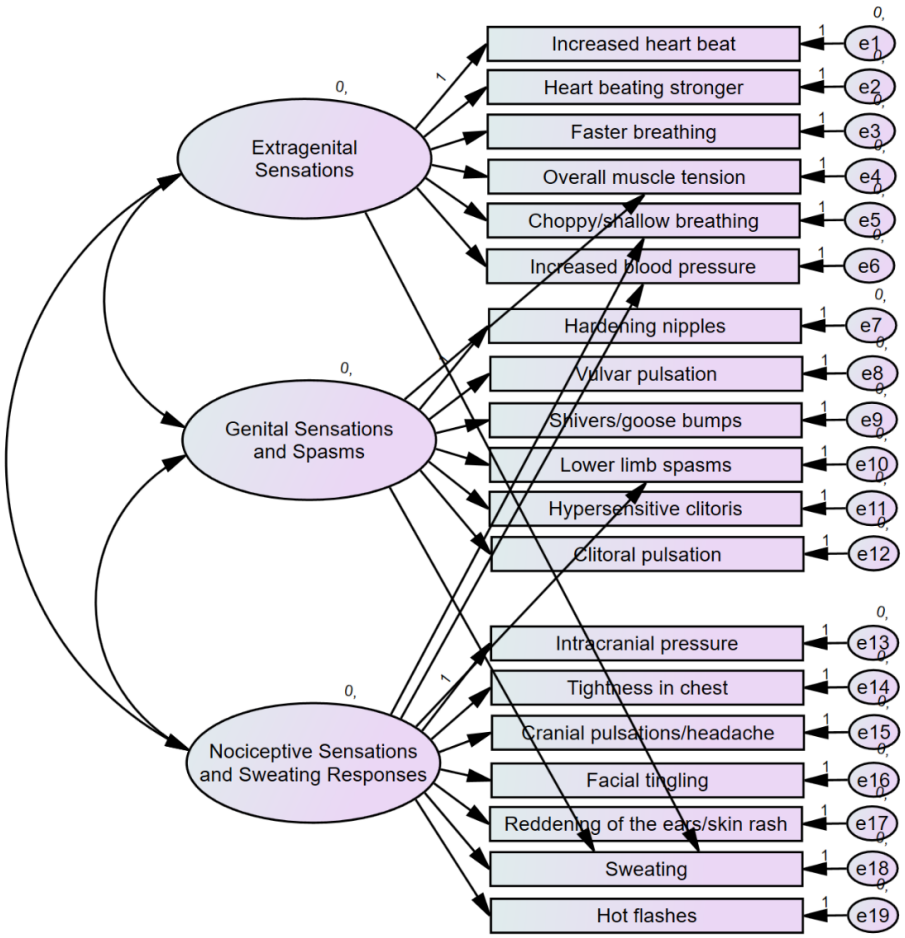
Multi-Group Confirmatory Factor Analysis Models for the ORS and BSOS



Note. MGCFA model for the Orgasm Rating Scale – solitary and partnered contexts



Note. MGCFA model for the Bodily Sensations of Orgasm Scale – solitary context



Note. MGCFA model for the Bodily Sensations of Orgasm Scale – partnered context

Appendix P

Solitary and Partnered Context Category Definitions

Solitary and Partnered Context Category Definitions

Categories	Definitions
Desire	An emotional and motivational state characterized by an interest in or a drive to seek out or engage in sexual activities
Effort	Conscious exertion of power or energy
Experimentation	The action or process of trying out new ideas, methods, or activities
Frequency	The rate at which something occurs or is repeated over a particular period of time
Functional	Having a particular activity, purpose, or task, designed to be practical and useful
Sex guilt	A generalized expectancy for self-monitored punishment for violating or anticipating the violation of internalized standards associated with socially acceptable sexual behaviours
Health	The state of being free from mental or physical illness or injury; a person's psychological or physical condition
Intensity	The magnitude of a quantity; the degree of strength, force, energy, or feeling
Duration	The time during which something continues
Compared to partnered	To consider similarities and differences between masturbation and partnered sexual activity
Pleasure	The physical and psychological ***enjoyment*** derived from sexual experiences
Privacy	Being free from being observed or disturbed by other people
Satisfaction	How someone feels about their sexual life when considering its positive and negative qualities
Self-knowledge	An ongoing, curious, and compassionate relationship between you and your sexual self
No change	A period or state of inactivity

Note. Solitary context.

Categories	Definitions
Desire	An emotional and motivational state characterized by an interest in, or a drive to seek out or engage in sexual activities or use sexual objects
Duration	The time during which something continues
Health	The state of being free from mental or physical illness or injury; a person's psychological or physical condition
Effort	Conscious exertion of power or energy
Excitement	A feeling of great enthusiasm and eagerness
Frequency	The rate at which something occurs or is repeated over a particular period of time
Intensity	The magnitude of a quantity; the degree of strength, force, energy, or feeling
Masturbation	Stimulation of the genitals with the hand or a sexual aid/toy for sexual pleasure
Adverse states	Preventing success or development; harmful; unfavourable
Partner-related factors	A feature or quality belonging to a sexual partner
Pleasurable	The physical and psychological ***enjoyment*** derived from sexual experiences
Relationship factors	Factors contributing to any association or connection between people, whether intimate, platonic, positive, or negative
Satisfaction	How someone ***feels*** about their sexual life when considering its positive and negative qualities
Self-efficacy	One's perceived control of or confidence in the ability to perform a given sexual activity
No change	A period or state of inactivity

Note. Partnered context.