Characterizing the determinants of sexual dissatisfaction among heterosexuals: The specific role of dyadic coping

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Abstract

Sexual satisfaction is the most frequently studied sexual component of human sexuality related to its link with relationship satisfaction and stability (Sprecher & Cate, 2004). Previous studies have shown that sexual satisfaction is affected by personal, interpersonal, social and cultural variables, but few studies have considered the associations between these variables. The aim of this study was to evaluate a complex model of sexual satisfaction considering these various levels of variables and their associations. The study was conducted online and comprised 457 individuals in the final sample. The French version of the Index of Sexual Satisfaction evaluated the level of sexual dissatisfaction. Personal, interpersonal, social and cultural variables were assessed with questionnaires and their associations were investigated with the partial least squares-path method. The association between dyadic coping (positive and negative) and sexual dissatisfaction was mediated by relationship satisfaction. The model also showed three sequential mediations through dyadic coping and relationship satisfaction: first between intra-individual vulnerability and sexual dissatisfaction, second between intra-individual resources and sexual dissatisfaction, and third between conjugal characteristics and sexual dissatisfaction. The simple and sequential mediations were stronger for positive dyadic coping. The relationship between intra-individual resources and positive dyadic coping was significantly stronger in women, while the relationship between conjugal characteristics and positive dyadic coping was stronger in men. Dyadic coping plays a key role in sexual dissatisfaction. Clinical interventions should reinforce positive self-image (particularly in women), support emotional and physical vulnerabilities, and promote more supportive dyadic coping (particularly in men in a long-term relationship).

Keywords: sexual satisfaction, long-term relationship, dyadic coping, model, sex comparison

Introduction

Sexuality has been shown to play an important role in many romantic relationships (Foster et al., 2006). In France, Colson et al. (2006) showed that, regardless of sex, 17% of the 1,002 people surveyed were dissatisfied with their sex life. Bajos et al. (2008) found that, among 12,000 respondents, 10.1% of women and 13% of men were dissatisfied with their current sex life, which represent significant percentages.

Sexual satisfaction is generally considered as "the degree to which an individual is satisfied or happy with the sexual aspect of his or her relationship" (Sprecher & Cate, 2004). It is the most frequently studied component of human sexuality related to its link with relationship satisfaction and stability (Sánchez-Fuentes et al., 2014 ; Sprecher & Cate, 2004). Indeed, people who report lower sexual satisfaction declare more marital problems and lower marital quality, which increases marital instability (Shakerian et al., 2014; Yeh et al., 2006). Identifying the variables involved in sexual satisfaction is a major challenge both for improving marital well-being and for providing better support for couples' sexual difficulties. Our study thus seeks to examine these variables and their associations through an integrative model.

A growing body of research has identified several variables that may influence sexual satisfaction at various levels (personal, interpersonal, social and cultural variables) (Sánchez-Fuentes et al., 2014). Concerning personal factors, results regarding age are not consistent. Several studies have reported that age does not affect sexual satisfaction (Rahmani et al., 2010 ; Thomas et al., 2015), while others have found a significant decrease in sexual satisfaction as age increases (Castellanos-Torres et al., 2013; Flynn et al., 2016; Shahhosseini et al., 2014). However, Laumann et al. (2006) showed that older adults' sexual satisfaction (physical pleasure and emotional satisfaction) remains relatively high. Furthermore, sexual satisfaction is highly and positively associated with self-esteem and body image (Ambwani & Strauss, 2007; Higgins et al., 2011). Finally, people who reported excellent self-estimated physical health mentioned

greater sexual well-being (Laumann et al., 2006), satisfaction with their sex life (Flynn et al., 2016), and were more likely to be sexually active and more likely to report an interest in sex (Lindau, Schumm, Laumann, Levinson, O'Muircheartaigh, & Waite, 2007; Lindau, & Gavrilova, 2010). Other studies showed that people with chronic disease and symptoms of depression or anxiety reported significantly lower sexual satisfaction (Cyranowski et al., 2004; Flynn et al., 2016; Sánchez-Fuentes et al., 2014 ; Nicolosi et al., 2004; Shahhosseini et al., 2014).

Concerning interpersonal factors, several studies have shown that sexual satisfaction is strongly associated with relationship satisfaction (Rahmani et al., 2010; Butzer & Campbell, 2008; Byers, 2005; McNulty et al., 2016; Sprecher, 2002) and negatively correlated with relationship length (Sánchez-Fuentes & Sierra, 2015; Rainer & Smith, 2012). Moreover, stress in daily life and within the dyad (Bodenmann et al., 2010; Hurlbert et al., 2000) as well as marital conflicts concerning intimacy, time spent together, financial difficulties, domestic and family responsibilities, children's education and jealousy are associated with lower relationship satisfaction, sexual activity and satisfaction (Overall & McNulty, 2017). The birth of children may also interfere with sexual and relational functioning (Cowan & Cowan, 2000) owing to increased stress, sleep difficulties, emotional proximity with children, physical change in women, reduced time spent together, a different distribution of household tasks and the transition to parenting (Woolhouse et al., 2012). To cope with these stressful encounters, couples use dyadic adjustment strategies, which represent a supplementary resource to each partner’s own personal coping efforts and correspond to the ability of both partners to work together as a unit to fight off the deleterious effects of stress. Bodenmann (2005) and Bodenmann et al. (2010) showed that dyadic coping was positively associated with marital quality by lightening the negative influence of stress and enhancing the feeling of intimacy, as well as the representation of a helpful, trusting and supportive relationship. Moreover, more

positive dyadic coping (stress communication, supportive, delegated, and common dyadic coping) and less negative dyadic coping (hostile, ambivalent, and superficial dyadic coping) are essential to marital quality (less quarreling, more tenderness, and more togetherness) and satisfying sexual activity in couples (sexual satisfaction and behavior, and frequency of orgasm) (Bodenmann et al., 2006, 2010). In the same line, Fang et al. (2015) showed that among breast cancer survivors, negative dyadic coping (conflict, avoidance, self-blame and criticism) mediated the effect of women's body image on their sexuality (sexual function, sexual frequency, and sexual fear), while closeness, mutual activities and good memories improved it.

In addition to personal and interpersonal factors, Sánchez-Fuentes et al. (2014) showed the importance of social and cultural factors. Although few studies have investigated the influence of environment, it has been shown that good family relationships (Ji & Norling, 2004) and social support and networks (Henderson et al., 2009; Sánchez-Fuentes et al., 2014) are positively associated with sexual satisfaction. Furthermore, close and warm relationships with parents are related to sexual satisfaction in adulthood (Ojanlatva et al., 2003). Finally, sexual behaviors are related to spirituality and religious practices (Murray et al., 2007; Penhollow et al., 2005). Higgins et al. (2010) found that religious people reported a lower level of sexual satisfaction, while marital sanctification and joint in-home religious activities (particularly for husbands) were positively associated with sexual satisfaction (Dew et al., 2020).

While the influence of these factors on sexual satisfaction have generally been studied in isolation, Sánchez-Fuentes et al. (2014) and Pascoal et al. (2013) suggested that it is important to consider a complex model including personal, interpersonal, social and cultural variables that provides an integrative and comprehensive view of sexual satisfaction. This approach has already been used in a study on a Spanish sample (Sánchez-Fuentes et al., 2016). In our study with a French sample, we kept some of the variables studied in the Spanish study, such as social support, parenthood, depression, relationship satisfaction, religiosity (Sánchez-

Fuentes et al., 2016). We added others such as age, self-esteem, body image, self-rated health, dyadic coping, number of children and relationship length, which are variables related to sexual satisfaction (Ambwani & Strauss, 2007; Bodenmann, 2005; Cowan, & Cowan, 2000; Sánchez-Fuentes & Sierra, 2015; Higgins et al., 2011; Laumann et al., 2006).

The aims of the study

The first aim of this study was to test a model assessing the effects of all these personal, interpersonal, social and cultural variables and their associations on sexual satisfaction in a French sample. To this end, we used the French version of the most widely used scale internationally (Sánchez-Fuentes et al., 2014): the Index of Sexual Satisfaction. This scale considers sexual quality as a single dimension of a continuum with high levels of sexual satisfaction at one end (lower scores) and high levels of sexual dissatisfaction at the other end (higher scores) (Shaw & Rogge, 2016). Based on previous studies, we built a model in which we hypothesized that: (1) personal factors contribute to sexual dissatisfaction both directly and via interpersonal factors, (2) interpersonal and cultural factors directly contribute to sexual dissatisfaction, (3) social factors contribute to sexual dissatisfaction both directly and via personal factors. This model should provide better understanding of the determinants of sexual dissatisfaction and reveal major issues that should be targeted in interventions with couples who have sexual difficulties.

The model was also tested to identify possible differences between men and women regarding associations between the variables predicting sexual dissatisfaction. This comparison will contribute to determine the appropriate support needed regarding sex (if any).

Method

Procedure

The present study was conducted online in the French population, using the Limesurvey creation software. E-mails were sent to social networks (Facebook), acquaintances and students, inviting people to participate in a survey about their sexual activity and satisfaction. They were free to participate and could stop the survey at any time. If they agreed to participate, they could click on a link directing them to the study's home page and informed consent page. To be included, participants had to be 18 or older, native French speakers, heterosexual and they had to have been living with their romantic partner for at least one year.

Participants

In total, 1,305 people started filling in the online questionnaires and 692 completed them. The average time to fill in the questionnaires was 38 minutes. Participants who took less than 25 minutes to respond were removed from our final sample, as the short time frame suggested a lack of involvement. Finally, 457 individuals were selected for the study: 322 women and 135 men.

Ethical Approval

The survey was approved by the university's ethics committee and complied with the tenets of the Declaration of Helsinki (1975).

Measures

A first questionnaire collected individual socio-demographic data (sex, age, income, schooling, status), socio-demographic data on the partner (sex, age) and the couple (number of children, relationship length).

The Rosenberg Self-Esteem Scale (RSES) is a 10-item scale for assessing levels of self-esteem (Rosenberg, 1965) that has been validated in French (Vallieres & Vallerand, 1990). All statements are rated on a 4-point Likert scale ranging from Strongly disagree (1) to Strongly agree (4). The scale measures both positive and negative feelings about the self (e.g., "*All in all, I am inclined to feel that I am a failure*" or "*I am able to do things as well as most other people*"). The five negative statements were recoded, meaning that the higher the overall score, the greater the self-esteem. The internal reliability (Cronbach's alpha) was 0.89 in this study.

The Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) is a self-assessment questionnaire for depression and anxiety composed of 14 items that are rated on a 4-point scale from 0 to 3. Seven questions concern anxiety (total A), and seven relate to depression (total D). The higher the score, the more anxious or depressed the participant. The reliability coefficients obtained in our study were 0.78 for the depression dimension and 0.74 for the anxiety dimension.

The Body Image Questionnaire (BIQ) (Bruchon-Schweitzer, 1990) assesses individuals' body satisfaction and examines the perceptions, representations and emotions associated with the body. It is composed of 19 items that are rated on a 5-point bipolar scale presenting antithetical terms. The total score ranged between 19 and 95. The internal reliability (Cronbach's alpha) was 0.89 in this study.

Self-Rated Health (Wawrziczny et al., 2017) was assessed using two subjective questions: "*Would you say that your health is...*" for general health and "*When you compare yourself with other people of your age, would you say your health is...*" for health compared with people of the same age. The responses ranged from 1 (very good) to 5 (very bad). The

scores for both questions were added to give a total subjective health score. The higher the score, the worse health is perceived to be. The internal reliability in this study was 0.88 (Cronbach's alpha).

The Dyadic Adjustment Scale (DAS) assesses relationship satisfaction (Spanier, 1976). In this study, we used the short 16-item version validated by Antoine et al. (2008). This scale was used to explore two dimensions: the degree of agreement between the two partners and the quality of their dyadic interactions. The items were rated on a 6-point scale. The reliability coefficient obtained in our study was 0.87 for the "Quality of interactions" dimension and 0.88 for the "Degree of Agreement" dimension.

The Dyadic Coping Inventory (DCI) (Ledermann et al., 2010) is a 37-item self-reported inventory based on a 5-point Likert scale (1 =very rarely to 5 =very often). The original DCI has nine subscales; however, the Joint DC subscale was not used in order to keep only the eight subscales which describe behaviors shown either by oneself or by one's partner. The internal reliabilities (Cronbach's alpha) for the eight scales were 0.65 (Stress Communication by Self), 0.69 (Stress Communication by Partner), 0.88 (Supportive DC by Self), 0.91 (Supportive DC by Partner), 0.82 (Negative DC by Self), 0.79 (Negative DC by Partner), 0.83 (Delegated DC by Self), and 0.87 (Delegated DC by Partner) in our study.

The Parental Bonding Instrument (PBI) (Parker et al., 1979) retrospectively assesses the behaviors and attitudes of participants' mothers and fathers towards them from birth to age 16. It contains 12 questions on the "care" dimension and 13 on the "protection" dimension for each parent. The care dimension ranges from rejection or coldness to warmth and affection, while the protection dimension ranges from allowance of autonomy to overprotection and

controlling behaviors. We only used the “care” dimension in this study because Sánchez-Fuentes et al. (2014) highlighted the importance of quality of family relationships and affection to predict sexual satisfaction. The reliability coefficients obtained in our study were 0.91 for “maternal care” and 0.80 for “paternal care”.

The Social Provisions Scale-10 item (SPS-10) is a shortened version of the Social Provisions Scale (Cutrona, & Russell, 1987) validated in French (Caron, 1996). The Social Provisions Scale (SPS-10) uses five subscales to measure the availability of social support: attachment, social integration, reassurance of worth, tangible help and orientation. The items are evaluated on a four-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). The internal reliabilities (Cronbach’s alpha) for the five scales were 0.76 (attachment), 0.75 (social integration), 0.79 (reassurance of worth), 0.84 (tangible help), and 0.86 (orientation) in our study.

Religiosity was assessed for each participant and his/her partner by using two subjective questions: "*Are you a believer?* " and " *Do you practice your religion?*". The responses ranged from 1 (not at all) to 7 (extremely). We formulated these two questions based on the definition of the construct of religiosity that refers both to beliefs and to practices to search for the divine (Bremer et al., 2004). The scores for the two questions were added to give a total religiosity score for each. The higher the score, the higher the religiosity score of the participant/partner.

The French version of the Index of Sexual Satisfaction (ISS: Santos-Iglesias et al., 2009; French version: Comeau & Boisvert, 1985; Hudson, Harrison, & Crosscup, 1981; Lussier, Bélanger, & Sabourin, 2019) was used. It is the most frequently used questionnaire in studies focusing on sexual satisfaction (Sánchez-Fuentes et al., 2014). The ISS is a 25-item scale based

on a Likert-type scale (0 = rarely or never; 4 = most of the time or always). The overall score varies between 0 and 100. The internal reliability (Cronbach's alpha) was 0.95 in this study. Given that higher scores correspond to higher levels of sexual dissatisfaction, the results should be interpreted accordingly.

Statistical analyses

In step 1, means, SDs and percentages were calculated for the sociodemographic data. Analyses were performed using the Statistical Package for the Social Sciences (SPSS; IBM, Armonk, NY). T-tests and chi-square tests were performed to compare the two groups (men and women) depending on whether the variables were continuous or categorical, respectively. The probability level used to indicate statistical significance was set at $p < 0.05$.

In step 2, we used Partial Least Squares Path Modeling (PLS-PM) to study complex multivariate relationships between manifest variables and latent variables. PLS-PM is a variance-based structural equation modeling (SEM) technique that does not rely on distributional assumptions and is able to deal with small sample sizes and non-normality (Chin et al., 2003). The SEM model estimation requires a set of assumptions to be fulfilled, including the multivariate normality of data and a minimum sample size (Diamantopoulos & Siguaw, 2000). Since the sample comprised 135 men, it was feasible to use the PLS-PM. Indeed, because each causal subsystem sequence of paths is estimated separately in the PLS-PM approach, Tenenhaus et al. (2005) suggested that the sample size should be equal to the larger of the following: 10 times the number of indicators of the scale with the largest number of manifest indicators. As such, the sample size should be larger than 70 participants in this study, suggesting that the PLS-PM analyses were feasible with the present analytical sample. Unlike classical structural equation models, the PLS-PM does not

use maximum likelihood estimations of the parameters based on the variance–covariance matrix. It is a full information procedure that iteratively performs a series of linear regressions.

Two models were used to describe the PLS-PM: the outer model connecting the manifest variables (MVs) to their latent variables (LVs), and the structural inner model relating some latent variables to others. The outer model was constructed with the possibility of PLS-PM to incorporate reflective and formative latent variables (Hair et al., 2017). Formative latent variables are considered as formative constructs because their indicators are not interchangeable and determine a specific aspect of the construct's domain, while reflective latent variables are defined as reflective constructs because the indicators are related to each other and present a high overlap (Hair et al. 2017). We used bootstrapping with 1,500 resamples to estimate probability values for significance testing. The quality of this outer model was acceptable regarding unidimensionality (DG-rho > 0.70), internal consistency reliability (Cronbach's alpha > 0.70), discriminant validity (Heterotrait-monotrait ratio < 0.80), convergent validity (AVE > 0.50) and multicollinearity (VIF < 5) for the LVs (Henseler et al., 2015; Marcoulides, 1998; Tenenhaus et al., 2005). The standardized root mean square residual indicated a good fit (Henseler et al., 2015). Finally, we compared models based on sex (female versus male). PLS-PM analyses were conducted with SmartPLS version 3.2.1 (Hair et al., 2016).

Results

Characteristics of participants

Table 1 shows the sociodemographic data. Participants were primarily women. Men were significantly older than women (men: 40.07 years [SD: 15.39]; women: 32.80 years [SD: 11.80]). Partners of men were significantly older than partners of women (men: 38.35 years [SD: 14.97]; women: 35.34 years [SD: 12.7]). Men were in a relationship for a longer period of time than women (men: 15.30 years [SD: 13.31]; women: 10.16 years [SD: 10.26]). Men

reported a higher conjugal income than women (men: 61.4% with a monthly conjugal income superior to 2,700 euros; women: 62.1% between 1,500 and 3,900 euros). The two groups were comparable in terms of marital status, schooling and employment status.

----------INSERT Table 1----------

Reflective-Formative measurement model with PLS-PM

The model is composed of *three formative latent variables* and *seven reflective latent variables*. The reflective latent variables include: *Intra-individual resources* (including self-perception associated with better interpersonal functioning), *Intra-individual vulnerability* (including emotional or health state associated with worse interpersonal functioning), *Relationship satisfaction* (including the perception of the quality of conjugal adjustment), *Conjugal characteristics* (including number of children and relationship length), *Religiosity* (including the level of practice and belief of each partner), *Social support* (including family care and social networks) and *Sexual dissatisfaction* (including the level of sexual dissatisfaction).

The three formative latent variables are: *Positive dyadic coping* (including the assistance given by each partner to the other in his or her coping efforts through problem- and emotion-focused support or to reduce the partner's stress), *Negative dyadic coping* (including the hostile, ambivalent or superficial support given by each partner to the other) and *Age* (including the age of the participant).

The model involved 28 MVs (outer model) loads on 10 LVs (inner model). The Supplemental Table shows the descriptive statistics (mean, SD) of MVs for all participants, men and women.

Outer model

The first steps consisted of selecting MVs. Seven MVs were removed because of non-significant loadings (loading < 0.70): two MVs for the *social support* LV (care father and care mother); one MV for the *conjugal characteristics* LV (number of children) and four MVs for the *positive dyadic coping* LV (delegated dyadic coping by oneself, delegated dyadic coping by the partner, stress communication dyadic coping by oneself and stress communication dyadic coping by the partner). We observed that the "delegated dyadic coping by oneself" and "by the partner" MVs had an outer loading that was significant, but the corresponding indicator weight was not significant, so we did not keep it. The resulting outer model comprised 21 MVs loaded on 10 LVs (Table 2).

----------INSERT Table 2----------

Inner Model

The proportion of explained variance (R^2) for the LVs of *Intra-individual resources, Intra-individual vulnerability, Relationship satisfaction, Positive dyadic coping, Negative dyadic coping and Sexual dissatisfaction* was 0.15, 0.15, 0.58, 0.25, 0.20, and 0.44, respectively. The SRMR was 0.06. The direct and indirect bootstrapped path coefficients are displayed in Table 3 and Table 4. Figure 1 shows the path coefficients (β) between LVs for the inner model.

----------INSERT Table 3----------

----------INSERT Table 4----------

Concerning hypothesis (1), the most significant direct paths were: a negative association between *intra-individual vulnerability* and *positive dyadic coping* (β = -0.35), a moderate and positive association between *intra-individual vulnerability* and *negative dyadic coping* (β =

0.30), and a negative association between *intra-individual resources* and *sexual dissatisfaction* (β = -0.20). The most significant indirect effect observed was from *intra-individual vulnerability* through *positive dyadic coping* and *relationship satisfaction* to *sexual dissatisfaction* (β = 0.10). Non-significant associations were observed between *sexual dissatisfaction* and *intra-individual vulnerability/age.*

Concerning hypothesis (2), the most significant direct paths were: high associations between *positive dyadic coping* and *relationship satisfaction* (β = 0.57) and between *relationship satisfaction* and *sexual dissatisfaction* (β = -0.48), moderate and negative associations between *negative dyadic coping* and *relationship satisfaction* (β = -0.27) and between *conjugal characteristics* and *positive dyadic coping* (β = -0.26). The most significant indirect effects observed were from *positive dyadic coping* through *relationship satisfaction* to *sexual dissatisfaction* (β = -0.27), and from *negative dyadic coping* through *relationship satisfaction* to *sexual dissatisfaction* (β = 0.13). Non-significant associations were observed between *sexual dissatisfaction* and *positive dyadic coping/negative dyadic coping.*

Concerning hypothesis (3), the most significant direct paths were: a moderate and positive association between *social support* and *intra-individual-resources* (β = 0.39), a moderate and negative association between *social support* and *intra-individual vulnerability* (β = -0.39). Non-significant associations were observed between *sexual dissatisfaction* and *social support/religiosity.*

----------INSERT Figure 1----------

Sex comparison

For the path comparison between men and women, we used a resampling approach with a bootstrap t-test procedure (Table 3). Direct path results indicated that the link between *intra-*

individual resources and *positive dyadic coping* was significantly stronger for women than for men, and that the link between *conjugal characteristics* and *positive dyadic coping* was significantly stronger for men than for women.

Discussion

The main aim of this study was to examine a multidimensional model considering variables at four levels: personal (age, self-esteem, body image, depression, anxiety, self-rated health), interpersonal (relationship satisfaction, dyadic coping, relationship length), social (social support) and cultural (religiosity). The potential sex-related differences in this complex model were explored.

This model provided a good data fit and accounted for 44 % of the variance for sexual dissatisfaction. To our knowledge, only one study so far has included these four levels of factors in their model of sexual satisfaction (Sánchez-Fuentes et al., 2016). Their model attributes a high level of importance to sex life characteristics (desire, arousal, erection, orgasm, attitudes and assertiveness), while our model highlights the importance of conjugal life characteristics (relational satisfaction, relationship length and particularly dyadic coping). Moreover, while the model of Sánchez-Fuentes et al. (2016) has already shown the association between social support and relationship satisfaction, our model shows that this association is mediated by intra-individual variables (resources and vulnerability) and the quality of dyadic coping (supportive and negative). In addition to the level of depression in their model, our model includes the influence of intra-individual resources, such as self-esteem and body image, whose link with sexual satisfaction has already been established (Ambwani & Strauss, 2007; Higgins et al., 2011).

Principal results

Hypothesis (1) is partially validated since intra-individual resources directly contribute to sexual dissatisfaction and intra-individual variables (resources/vulnerability) contribute to sexual dissatisfaction via dyadic coping and relationship satisfaction. However, age does not contribute to sexual dissatisfaction. Our results underline the major influence of intra-individual variables (self-esteem, body image, depression, anxiety and self-rated health). Previous studies already showed the direct link between self-esteem, body image or depression and sexual satisfaction (Ambwani & Strauss, 2007; Cyranowski et al., 2004; Higgins et al., 2011; Nicolosi et al., 2004). We showed that, when conjugal and environmental variables are introduced in the model, mediating effects are observed through positive and negative dyadic coping and relationship satisfaction.

Concerning the sequenced mediation observed between intra-individual vulnerability and sexual dissatisfaction (mediators: dyadic coping and relationship satisfaction), Bodenmann et al. (2004) found that depressed couples reported less positive dyadic coping (in particular supportive dyadic coping) and more negative dyadic coping than couples without a depressed partner. Similarly, our model shows the following: first, high vulnerability is associated with less positive dyadic coping, which is associated with low relationship satisfaction and finally with sexual dissatisfaction; second, high vulnerability is linked to more negative dyadic coping, which is linked to low relationship satisfaction and finally to sexual dissatisfaction. This sequential mediation is stronger for positive dyadic coping.

Regarding the partial sequential mediation between intra-individual resources and sexual dissatisfaction, previous studies have shown the clear association of body image and self-esteem with sexual satisfaction (Ambwani & Strauss, 2007; Higgins et al., 2011; Lin & Lin, 2018). Nevertheless, the relationship is also mediated by the quality of dyadic coping and relationship satisfaction. The more resources persons have, the less they resort to negative dyadic coping; the more satisfied they feel with their relationship, the more sexually satisfied

they are. Importantly, the link between resources and positive dyadic coping is not significant because it is overshadowed by the sex effect. In fact, the association between intra-individual resources and positive dyadic coping is stronger in women. The more resources women have, the more they resort to positive dyadic coping. This result is consistent with the findings of Johnson et al. (2017) and Fang et al. (2015) about the effect of women's self-esteem and body image on dyadic coping (particularly the partner's) and on their sexual relations. Moreover, women were more likely than men to report that body image influenced their sexual relations (Ambwani & Strauss, 2007). Our model shows that body satisfaction and self-esteem may serve as protective factors, particularly for women to use positive dyadic coping and therefore to promote relationship and sexual satisfaction.

Age was not significantly associated with sexual dissatisfaction, so it might rather be a determining factor of sexual expression (DeLamater & Moorman, 2007) rather than sexual satisfaction. Previous studies have shown that a decrease in the frequency of sexual activity is observed with age in relation to a decline in sexual health and functionality (Lindau & Gavrilova, 2010). Gades et al. (2009) showed that older men may find it easier to accept sexual problems and are therefore less likely to be dissatisfied. Moreover, while age is predictive of decreased sexual activity, older people tend to remain sexually active and be satisfied with their relationship if they have an available partner and if sexual satisfaction is important to them. (Benbow & Beeston, 2012; DeLamater & Sill, 2005; Kontula & Haavio-Mannila, 2009).

Hypothesis (2) is partially validated because relationship satisfaction and conjugal characteristics directly contribute to sexual dissatisfaction. However, religiosity does not contribute directly to sexual dissatisfaction, nor do positive and negative dyadic coping without the mediation of relationship satisfaction. The association between dyadic coping and sexual dissatisfaction mediated by relationship satisfaction was stronger for positive dyadic coping. This result is consistent with previous studies that showed that positive dyadic coping is

associated with solidarity, cohesion, stability and satisfaction in a relationship, while negative dyadic coping is associated with lower marital quality and relationship satisfaction (Bodenmann et al., 2006; Clymer et al., 2006). This is particularly true for supportive dyadic coping (Bodenmann et al., 2011; Herzberg, 2013; Papp & Witt, 2010) and for the perception of the other partner's supportive dyadic coping (Landis et al., 2013). Moreover, relationship satisfaction and efficacy of dyadic coping are positively related with sexual outcomes (Bodenmann et al., 2010; Henderson et al., 2009). Nevertheless, to our knowledge, no study has shown the link between these three variables: relationship satisfaction, dyadic coping and sexual satisfaction. In our work, we demonstrate that more positive dyadic coping is associated with high relationship satisfaction and finally with low sexual dissatisfaction, and that more negative dyadic coping is associated with low relationship satisfaction and finally with high sexual dissatisfaction.

Our model shows that the association between couple characteristics and sexual dissatisfaction is direct and doubly mediated by dyadic coping and relationship satisfaction. Previous studies showed that relationship length is negatively correlated with marital and sexual satisfaction (Cowan & Cowan, 2000; Rainer & Smith, 2012) and that supportive dyadic coping declines over the marital course for both men and women (Johnson et al., 2016). Our model highlights the link between these variables: the longer the duration of a long-term relationship, the less the resort to positive dyadic coping. The more the partners use negative dyadic coping, the more they are dissatisfied with their relationship and the more sexually dissatisfied they become. Partial sequential mediation is stronger for positive dyadic coping and decline in supportive coping is particularly stronger in men.

Hypothesis (3) is partially validated because social support does not directly contribute to sexual dissatisfaction unless it is mediated by intra-individual resources and vulnerability. Our results show that social support goes a long way in explaining intra-individual variables.

Previous studies showed that social support is inversely associated with depression (Dehle et al., 2001; Henderson et al., 2009) and can be regarded as a resource that facilitates people's coping strategies and their feeling of self-efficacy (Schwarzer & Knoll, 2007). Furthermore, the present model suggests that social support may serve as a protective factor that contributes to the enhancement of intra-individual resources and to decreasing the sense of vulnerability.

Variables removed from the model

Delegated dyadic coping by oneself, delegated dyadic coping by the partner, stress communication dyadic coping by oneself and stress communication dyadic coping by the partner were removed because of non-significant loadings. This result is consistent with the study by Falconier et al. (2015), which demonstrated that supportive dyadic coping is a better predictor of relationship satisfaction than stress communication or delegated dyadic coping.

Moreover, the number of children was removed because of non-significant loading. This result is consistent with the findings of VanLaningham et al. (2001) and Whiteman et al. (2007), who showed a significant negative effect of relationship length on marital happiness/satisfaction, in specific moments such as the beginning of parenthood and the onset of puberty in offspring. Therefore, it is not the number of children that appears to influence sexual and marital satisfaction so much as the period of time spent with children, such as the neonatal period and adolescence. This suggests that the effect of this variable should be investigated in longitudinal studies.

Clinical implications

This study demonstrates the need to promote more supportive dyadic coping by helping both partners access their own emotions and related needs. This would offer the other partner the possibility to understand his/her partner and to provide the support that meets his/her needs,

particularly for men. In turn, this would promote the feeling of intimacy between partners and relationship satisfaction, especially on the sexual level. In addition, dyadic coping should be promoted by improving a positive self-image and supporting one's partner's emotional and physical state, particularly for women.

Limitations

This research should be considered in the light of the following limitations. First, participants were predominantly women and the sample was relatively young. This could be due to the online data collection method. Although it is similar to other recruitment methods regarding the validity of data (Gosling et al., 2004), it may lead to sampling a specific group of individuals who have access to a computer and are confident in such technology. This could explain why older people were less represented. Second, differences were observed between the two groups (men and women) regarding age, relationship length, number of children and socio-economic level. Socio-demographic data need to be controlled in future research. Third, since the number of men was low regarding the number of variables, a larger sample would have facilitated the use of SEM and the test for the possible bidirectional effects between variables. This confirmatory analysis would provide several measures of fit and make it possible to examine more complex and less unidirectional associations between the variables. Fourth, in order to propose a complex model of sexual dissatisfaction, we examined a large set of variables. This meant that the protocol was long, which might have led to several participants dropping out. Fifth, although the model highlighted the negative association between relationship length and dyadic coping, it should be used to compare groups with different relationship lengths or at different times within their relationship, in a longitudinal design assessing the evolution of the model. Finally, in order to expand our findings to other kinds of relationships, the model should also be tested among same-sex couples.

Conclusion

This study highlights the importance of considering different levels of variables (personal, interpersonal, social and cultural variables) when examining sexual dissatisfaction. The results show that more negative dyadic coping and principally less supportive dyadic coping are associated with low relationship satisfaction, which is associated with sexual dissatisfaction, especially in long-term couples. It demonstrates that the ability to take on responsibilities or tasks to reduce one's partner's stress or make efforts to provide problem- and emotion-focused support (e.g., providing advice, empathic understanding, helping one's partner to accomplish tasks, reframing the situation, or helping the partner to relax) (Ledermann et al., 2010) plays a key role in sexual satisfaction. Moreover, two main dimensions in the experience of sexual satisfaction distinguished men and women. Therefore, clinical interventions should aim at the following: first, reinforcing positive self-image, particularly in women, and supporting emotional and physical vulnerabilities; second, promoting more supportive dyadic coping by striving for a better understanding of each other, and developing and reinforcing the feeling of intimacy, particularly in men in a long-term relationship.

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Conflict of interest

None declared.

Data availability statement

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

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Table 1. Sociodemographic data

Variables	All participants (N=457)				Men (N=135)				Women (N=322)				*t*-test	χ^2
	M	**SD**	**N**	**%**	**M**	**SD**	**N**	**%**	**M**	**SD**	**N**	**%**		
Age of participant	34.94	13.37			40.07	15.39			32.80	11.80			4.92*	
Age of partner	36.23	13.46			38.35	14.97			35.34	12.7			2.04*	
Relationship length	11.68	11.47			15.30	13.31			10.16	10.26			4.01*	
Number of children	1.25	1.55			1.43	1.55			1.13	1.52			1.98*	
Status														2.63
Married			182	39.8			61	45.2			121	37.6		
In a civil partnership			47	10.3			11	8.1			36	11.2		
In a common-law relationship			228	49.9			63	46.7			165	51.2		
Monthly conjugal income (euros)														10.55*
< 1500			85	18.6			24	17.8			61	18.9		
Between 1500 and 2700			127	27.7			28	20.8			99	30.7		
Between 2700 and 3900			141	30.8			40	29.6			101	31.4		
> 3900			104	22.8			43	31.8			61	19		
Schooling														1.67
< High-school level			120	26.3			41	30.4			79	24.5		
> High-school level			337	73.7			94	69.7			243	75.5		
Gainfully employed			336	73.5			102	75.6			234	72.7		0.41

Abbreviations: M, mean; SD, standard deviation; N, number; %, percentage
*p<0.05

Table 2. Outer model and unidimensionality of each latent variable

Latent Variables (LVs)	Manifest Variables (MVs)	Weights	Unidimensionality
Social support	tangible help	0.21	α = 0.88 DG-rho = 0.88 Composite = 0.91 AVE=0.67
	attachment	0.24	
	social integration	0.28	
	orientation	0.23	
	reassurance of worth	0.28	
Age	age	1.00	
Intra-individual resources	self-esteem	0.52	α = 0.75 DG-rho = 0.76 Composite = 0.89 AVE=0.80
	body image	0.59	
Intra-individual vulnerability	anxiety	0.36	α = 0.68 DG-rho = 0.81 Composite = 0.82 AVE=0.60
	depression	0.61	
	self-rated health	0.28	
Positive dyadic coping	supportive dyadic coping by oneself	0.38	
	supportive dyadic coping by the partner	0.75	
Negative dyadic coping	negative dyadic coping by oneself	0.39	
	negative dyadic coping by the partner	0.75	
Conjugal characteristics	relationship length	1.00	α = 1.00 DG-rho = 1.00 Composite = 1.00 AVE=1.00
Relationship satisfaction	degree of agreement	0.53	α = 0.89 DG-rho = 0.89 Composite = 0.95 AVE=0.90
	quality of interactions	0.52	
Religiosity	religiosity of oneself	0.50	α = 0.70 DG-rho = 0.72 Composite = 0.87 AVE=0.76
	religiosity perceived of my partner	0.64	
Sexual dissatisfaction	sexual dissatisfaction	1.00	α = 1.00 DG-rho = 1.00 Composite = 1.00 AVE=1.00

Abbreviations: DG-rho, Dillon-Goldstein's rho; Composite, Composite reliability; AVE, Average variance extracted

Table 3. Direct bootstrapped path coefficients for all participants and comparison regarding sex

Variables	All participants		Women		Men		
	β Mean (SD)	95% bootstrap CI	β Mean (SD)	95% bootstrap CI	β Mean (SD)	95% bootstrap CI	Mean difference
Social support → Intra-individual resources	0.39 (0.05)	[0.29;0.48]*	0.41 (0.06)	[0.28;0.51]*	0.37 (0.07)	[0.20;0.50]*	0.04
Social support → Intra-individual vulnerability	-0.39 (0.05)	[-0.49;-0.30]*	-0.40 (0.06)	[-0.50;-0.28]*	-0.44 (0.07)	[-0.55;-0.29]*	0.04
Social support → Sexual dissatisfaction	-0.07 (0.04)	[-0.15;0.00]	-0.08 (0.05)	[-0.17;0.01]	0.05 (0.07)	[-0.09;0.20]	0.12
Intra-individual resources → Positive dyadic coping	0.10 (0.06)	[-0.02;0.21]	0.16 (0.07)	[0.02;0.29]*	-0.11 (0.10)	[-0.30;0.09]	0.28*
Intra-individual resources → Negative dyadic coping	-0.14 (0.06)	[-0.25;-0.02]*	-0.19 (0.07)	[-0.33;-0.04]*	0.00 (0.11)	[-0.23;0.21]	0.19
Intra-individual resources → Sexual dissatisfaction	-0.20 (0.05)	[-0.30;-0.09]*	-0.27 (0.07)	[-0.40;-0.14]*	-0.02 (0.10)	[-0.20;0.18]	0.26
Intra-individual vulnerability → Positive dyadic coping	-0.35 (0.06)	[-0.46;-0.24]*	-0.30 (0.06)	[-0.43;-0.17]*	-0.49 (0.09)	[-0.65;-0.28]*	0.18
Intra-individual vulnerability → Negative dyadic coping	0.30 (0.06)	[0.19;0.41]*	0.26 (0.06)	[0.12;0.38]*	0.38 (0.11)	[0.13;0.58]*	0.13
Intra-individual vulnerability → Sexual dissatisfaction	-0.01 (0.05)	[-0.11;0.10]	-0.03 (0.06)	[-0.16;0.09]	0.12 (0.10)	[-0.06;0.31]	0.15
Relationship satisfaction→Sexual dissatisfaction	-0.48 (0.06)	[-0.59;-0.37]*	-0.43 (0.07)	[-0.57;-0.29]*	-0.61 (0.11)	[-0.82;-0.40]	0.18
Positive dyadic coping → Sexual dissatisfaction	-0.01 (0.06)	[-0.13;0.09]	-0.02 (0.07)	[-0.15;0.13]	0.02 (0.11)	[-0.19;0.24]*	0.04
Positive dyadic coping → Relationship satisfaction	0.57 (0.05)	[0.46;0.65]*	0.59 (0.06)	[0.48;0.69]*	0.51 (0.11)	[0.29;0.70]*	0.09
Negative dyadic coping → Sexual dissatisfaction	-0.00 (0.06)	[-0.11;0.11]	0.01 (0.07)	[-0.14;0.16]	-0.00 (0.09)	[-0.19;0.16]	0.01
Negative dyadic coping → Relationship satisfaction	-0.27 (0.05)	[-0.37;-0.18]*	-0.25 (0.06)	[-0.36;-0.14]*	-0.32 (0.09)	[-0.50;-0.15]*	0.07
Conjugal characteristics → Positive dyadic coping	-0.26 (0.04)	[-0.34;-0.18]*	-0.21 (0.05)	[-0.31;-0.11]*	-0.39 (0.07)	[-0.51;-0.25]*	0.18*
Conjugal characteristics → Negative dyadic coping	0.19 (0.05)	[0.11;0.28]*	0.19 (0.05)	[0.08;0.29]*	0.23 (0.09)	[0.06;0.40]*	0.05
Conjugal characteristics → Sexual dissatisfaction	0.13 (0.06)	[0.00;0.25]*	0.17 (0.07)	[0.02;0.30]*	0.03 (0.12)	[-0.21;0.28]	0.13
Age → Sexual dissatisfaction	0.01 (0.06)	[-0.11;0.13]	-0.08 (0.07)	[-0.21;0.07]	0.11 (0.11)	[-0.10;0.33]	0.19
Religiosity→ Sexual dissatisfaction	0.03 (0.04)	[-0.04;0.11]	-0.01 (0.05)	[-0.14;0.07]	0.11 (0.07)	[-0.04;0.25]	0.12

Note: CI: Confidence Interval; *: $p<0.05$; SD: standard deviation

Variables	All participants	
	β Mean (SD)	95% bootstrap CI
Positive dyadic coping → Relationship satisfaction → Sexual dissatisfaction	-0.27 (0.04)	[-0.35;-0.20]*
Negative dyadic coping → Relationship satisfaction → Sexual dissatisfaction	0.13 (0.03)	[0.08;0.19]*
Intra-individual vulnerability → Positive dyadic coping → Relationship satisfaction → Sexual dissatisfaction	0.10 (0.02)	[0.06;0.15]*
Intra-individual vulnerability → Negative dyadic coping → Relationship satisfaction → Sexual dissatisfaction	0.04 (0.01)	[0.02;0.07]*
Intra-individual resources → Positive dyadic coping → Relationship satisfaction → Sexual dissatisfaction	-0.03 (0.02)	[-0.06;0.01]
Intra-individual resources → Negative dyadic coping → Relationship satisfaction → Sexual dissatisfaction	-0.02 (0.01)	[-0.04;-0.00]*
Conjugal characteristics → Positive dyadic coping → Relationship satisfaction → Sexual dissatisfaction	0.07 (0.02)	[0.05;0.10]*
Conjugal characteristics → Negative dyadic coping → Relationship satisfaction → Sexual dissatisfaction	0.02 (0.01)	[0.01;0.04]*

Table 4. Indirect bootstrapped path coefficients for all participants

Note: CI: Confidence Interval; * $p<0.05$; SD: standard deviation

Figure 1. PLS-PM graph for all participants.

Note: Bold lines show significant paths, the various thicknesses show low, moderate and high significance. Dotted lines show non-significant links between latent variables.