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## A Dyadic Approach to Understanding the Link Between Sexual Functioning and Sexual Satisfaction in Heterosexual Couples

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*Researchers have demonstrated that several dimensions of sexual functioning (e.g., sexual desire, arousal, orgasm) are associated with the sexual satisfaction of individuals in a committed mixed-sex (male–female) relationship. We extended this research by comparing a dyadic model that included both own (i.e., actor effect) and partner (i.e., partner effect) domains of sexual functioning to an individual model that included only actor effects. Participants were 124 mixed-sex couples who completed online measures of sexual functioning and sexual satisfaction. Data analysis using the actor–partner interdependence model (APIM) and structural equation modeling (SEM) indicated that the dyadic model had a better fit than the individual model. Women’s sexual desire and orgasm and men’s erectile functioning were significant positive predictors of both own and partner’s sexual satisfaction. These results are discussed in terms of the importance of taking a dyadic approach to research and clinical work related to sexual satisfaction.*

Sexual satisfaction is an indicator of sexual health and is associated with individual well-being (Byers & Rehman, 2014; Sánchez-Fuentes, Santos-Iglesias, & Sierra, 2014; World Health Organization, 2010). In keeping with Lawrance and Byers (1995), we defined sexual satisfaction as “an affective response arising from one’s subjective evaluation of the positive and negative dimensions associated with one’s sexual relationship” (p. 268). Most couples consider both their own and their partners’ sexual satisfaction to be an important aspect of their relationship (Basson, 2003; Byers, 2005; Byers &

Rehman, 2014; Fallis, Rehman, & Purdon, 2013). In fact, the association of sexual satisfaction with overall relationship satisfaction and well-being is so strong that sexual satisfaction has been identified as the barometer of marital life quality (e.g., Sprecher, Christopher, Cate, Vangelisti, & Perlman, 2006). This suggests that sexual satisfaction can only be fully understood from a dyadic perspective—that is, by taking into account the experiences of both partners. One important factor that has been shown to be associated with sexual satisfaction in relationships is sexual functioning: sexual desire, arousal, and orgasm (DeLamater, Hyde, & Fong, 2008; Pascoal, Narciso, Pereira, & Ferreira, 2013). However, most researchers have included only one member of the couple in studies and little is known about dyadic influences, or the effects of sexual functioning of both partners on their own and their partners’ sexual satisfaction.

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Furthermore, partners of individuals with a sexual dysfunction are more likely to experience sexual problems, providing indirect evidence for reciprocal influences between partners (e.g., Kaya, Gunes, Gokce, & Kalkan, 2015). Understanding the reciprocal influences between partners is crucial for developing interventions aimed at optimizing aspects of health, including sexual health and well-being (Reed, Butler, & Kenny, 2013). Therefore, the goal of this study was to examine the extent to which men's and women's sexual functioning is associated with both their own (i.e., actor effect) as well as their partners' (i.e., partner effect) sexual satisfaction. We chose to study mixed-sex couples as we were interested in possible gender differences in the magnitude of these associations.

### Theoretical Framework

Interdependence theory posits that individuals influence one another's experiences (i.e., the effects individuals have on other people's thoughts, emotions, motives, behaviors, and outcomes) through their interactions (Van Lange & Balliet, 2015). There is considerable evidence that interdependence among partners is an important characteristic of close relationships (Cook & Snyder, 2005; Knabb & Vogt, 2011; Reed et al., 2013; Van Lange & Balliet, 2015). Similarly, a number of theories related to sexuality and sexual well-being have forwarded hypotheses regarding dyadic influences (i.e., interdependence) on sexual functioning and sexual satisfaction. These include the interpersonal exchange model of sexual satisfaction (IEMSS; Byers, Wang, Harvey, Wenzel, & Sprecher, 2004; Lawrance & Byers, 1995), the circular model of sexual response (Basson, 2000), the "good enough sex" model (Metz & McCarthy, 2007), and the new view of women's sexual problems (Tiefer, 2010; Tiefer, Hall, & Travis, 2002). All of these models have highlighted aspects of interdependence among partners as influencing individuals' satisfaction with sex, with the IEMSS receiving the most empirical support. IEMSS predicts that an individual's affective response to the mutual exchange of sexual rewards and costs is more positive when one's sexual rewards exceed one's sexual costs and when the balance between rewards and costs is perceived as being equal to that of one's partner (e.g., Byers & MacNeil, 2006; Byers et al., 2004). Basson's (2000) circular model of sexual response regards women's sexual response and desire for sex as almost fundamentally dyadic, with sexual response being dependent upon sexual cues derived from partnered sexual behavior. Metz and McCarthy's (2007) "good enough sex" model aims to foster reasonable expectations regarding the various meanings of couple's sexuality, the quality of which may vary from sexual event to sexual event. Finally, the new view of women's sexual problems (Tiefer et al., 2002) considers women's sexual problems not as originating from individual dysfunction but from, among other things, unfavorable dynamics within couples' relationships.

Despite these models, few researchers have used couples as the unit of analysis (Levin, 2008; Yucel & Gassanov, 2010). However, research with clinical samples provides evidence of couple interdependence with respect to sexual functioning. Specifically, researchers have shown that, in mixed-sex

couples, an individual's sexual functioning is affected by a partner's sexual dysfunction—for both couples in which the female partner has vaginismus or genital pain (Bergeron, Rosen, & Pukall, 2014; Klein, Koops, Lange, & Briken, 2015) and couples in which the man has erectile dysfunction or premature ejaculation (Conaglen & Conaglen, 2008; Kaya et al., 2015).

### Association Between Sexual Functioning and Sexual Satisfaction

Researchers in several countries have demonstrated a positive association between an individual's sexual functioning and their own sexual satisfaction (MacNeil & Byers, 1997; Pakpour, Yekaninejad, Pallich, & Burri, 2015; Stulhofer, Gregurovic, Pkic, & Galic, 2005; Zhang, Fan, & Yip, 2015). This association has also been demonstrated for specific domains of sexual functioning, including sexual desire in men and women (Hurlbert, Apt, & Rabehl, 1993; Štulhofer, Ferreira, & Landrijet, 2013); erection (Mulhall, King, Glina, & Hvidsten, 2008); arousal and lubrication in women (Levin, 2003; Schwenkhagen, 2007; Wiegel, Meston, & Rosen, 2005); and experience of orgasm in men and women (e.g., Fugl-Meyer, Öberg, Lundberg, Lewin, & Fugl-Meyer, 2006; McClelland, 2011).

Researchers also have demonstrated an association between an individual's overall sexual functioning, as well as specific sexual functioning domains (e.g., women's and men's orgasms, men's and women's desire, men's erections), and a partner's sexual satisfaction (Fisher et al., 2015; Heiman et al., 2011; Mark & Murray, 2012; Muehlenhard & Shippee, 2010; Rosen, Heiman, Long, Fisher, & Sand, 2016). However, most of this research collected data from only one member of the couple. That is, the researchers assessed participants' sexual satisfaction and their perceptions of their partners' sexual functioning. Even when researchers have collected data from both members of the couple, for the most part they have not taken a dyadic approach to data analysis that considers the couple as a unit of analysis (e.g., Heiman et al., 2011). Instead, they have used data-analytic procedures that assume the independence of observations (e.g., *t* tests, analysis of variance [ANOVA], multiple regression) (Mustanski, Starks, & Newcomb, 2014). This is problematic because research has shown that partners' sexual functioning (Cayan, Bozlu, Canpolat, & Akbay, 2004; Dogan & Dogan, 2007; Greenstein, Abramov, Matzkin, & Chen, 2005; Shabsigh, Anastasiades, Cooper, & Rutman, 2006) and satisfaction (Byers & MacNeil, 2006; Fisher et al., 2015) are interdependent. Thus, it is impossible to determine the extent to which the link between an individual's sexual functioning and a partner's sexual satisfaction was due to the individual's own sexual functioning (actor effect) rather than, or in addition to, the partner's sexual functioning (partner effect). To shed light on the unique contributions of own and partner sexual functioning on sexual satisfaction, we collected data from both members of the couple and took both actor and partner effects as well as the correlations between variables into account using the actor-partner interdependence model (APIM; Kenny, Kashy, & Cook, 2006).

### The Actor–Partner Interdependence Model

The APIM is a framework for analysis of dyadic data (Kenny & Cook, 1999; Kenny et al., 2006). It is especially suited for mixed dyads (i.e., scores vary both between dyads and within dyads) and examines both actor effects (i.e., the association between an individual's scores on a predictor variable and his or her scores on an outcome variable) and partner effects (i.e., the association between an individual's scores on a predictor variable and a partner's scores on an outcome variable). A few studies using the APIM with couples have demonstrated that sexual satisfaction is better explained from an interdependence perspective than from an individual perspective. For example, in their study of 91 mixed-sex couples in long-term relationships, Rehman, Rellini, and Fallis (2011) found that both men's and women's sexual satisfaction was associated with their own sexual self-disclosure; controlling for these relationships, men's but not women's sexual satisfaction also was associated with their partner's sexual self-disclosure. Rubin and Campbell (2012) demonstrated, with a sample of 67 mixed-sex couples involved in long-term relationships, that both the men's and the women's perceptions of changes in intimacy over a 21-day period were associated with both partners' sexual satisfaction. Finally, Yucel and Gassanov's (2010) study with 433 mixed-sex couples demonstrated that higher marital satisfaction and sexual frequency were associated with higher own sexual satisfaction for both men and women; lower spouse's infidelity and solitary pornography use were associated with higher partner's sexual satisfaction.

Only one study has investigated the relationship between sexual functioning and sexual satisfaction using a dyadic approach. Using APIM with an international sample of mixed-sex couples in five countries, Fisher and colleagues (2015) showed that, for men, both their own and their partners' sexual functioning were associated with their reports of being sexually satisfied; for women, only their own and not their partners' sexual functioning was associated with their reports of being sexually satisfied. However, the researchers dichotomized sexual satisfaction rather than using it as a continuous measure, thus losing information due to reduced variability and diminishing statistical power to detect an association among the variables (Altman & Royston, 2006). Furthermore, they used a global measure of sexual functioning and did not assess the effects of specific sexual functioning domains. It may be that sexual satisfaction is affected by poor functioning in some areas and not others. Finally, the authors did not assess gender differences in the strength of the associations found.

### The Current Study

The goal of the current study was to examine the extent to which each partner's levels of sexual desire, arousal,<sup>1</sup> and

orgasm are associated with own as well as with a partner's sexual satisfaction in a sample of Portuguese couples in mixed-sex committed relationships. In keeping with previous research, we offered the following hypotheses:

- H1:** Own sexual functioning (i.e., desire, erection/lubrication, and orgasm) will be associated with own sexual satisfaction (actor effects).
- H2:** Own sexual functioning will be associated with partner's sexual satisfaction (partner effects).
- H3:** A dyadic model (i.e., actor and partner effects) will better predict sexual satisfaction than will an individual model (i.e., actor effects only).

Because there has been no research that has examined gender differences in predictors of sexual satisfaction in the context of dyadic studies, we did not propose a hypothesis related to gender. Nevertheless, we asked the following research questions:

- RQ1:** Are there gender differences in the strength of the unique effects found?
- RQ2:** Are the actor and partner effects similar in strength?

## Method

### Participants

Recruitment was aimed at individuals self-identified as heterosexual above the age of consent in Portugal (18 years) who were involved in a committed, exclusive, mixed-sex romantic relationship. The exclusion criteria were pregnancy, breastfeeding, and any medical condition (e.g., diabetes) or medication (e.g., hormone therapy) that could interfere with sexual functioning. Information about the study was provided through direct e-mailing from the first author to members of her professional and social network, through her professional Facebook page, and in advertising through newsletters and posts on Facebook that directed potential participants to the informed consent Web page.

A total of 1,258 people gave informed consent to participate in the study. A total of 974 of these individuals were dropped from the survey: 703 (56%) because they did not complete the survey, and 289 (23%) who completed the survey but whose partner did not do so. In addition, three couples were dropped because they indicated that they had not engaged in sexual activity in the previous four weeks, and 11 couples were dropped due to the presence of more than 10% missing data. The final sample comprised 124 couples in a mixed-sex committed relationship.

The ages of the male participants ranged from 19 to 69 years ( $M = 30.11$ ;  $SD = 10.12$ ) and the women's ages ranged from 18 to 62 years ( $M = 28.84$ ;  $SD = 9.64$ ). Almost all ( $n = 228$ ; 92%) participants lived in an urban area. There were 80 couples in a noncohabiting committed relationship.

<sup>1</sup> We have restricted ourselves to scales that were available for both men and women: desire, erection/lubrication, and orgasm. We used erection and lubrication as they are both psychophysiological indicators of genital sexual response.



(65%; mean duration = two years). Of the 44 couples (35%) who were cohabiting, 27 were married (21%; mean duration = 12 years) and 17 were living in a common-law relationship (14%; mean duration = six years). The mean relationship duration for the whole sample was 4.5 years ( $SD = 5.65$ ; range: 0.5 to 38 years). The sample was predominantly nonreligious ( $n = 185$ ; 69%) and highly educated, with 187 participants (69%) having at least an undergraduate degree.

We examined differences between study participants and those who were dropped because their partners did not complete the survey. There was no gender difference in the likelihood that the partner completed the survey. The remaining analyses were done separately for the men and women. We used chi-square tests for independence (with Yates continuity correction) for the categorical variables (urban versus rural residence, relationship status, education, religion) and ANOVA for the continuous variables (age, relationship duration, desire, arousal, orgasm). Both the men and the women whose partners completed the survey were significantly more likely to be cohabiting (35% versus 65% for the men and 33% versus 57% for the women),  $\chi^2(1, n = 296) = 14.16, p < .001, \phi = .23$  and  $\chi^2(1, n = 296) = 14.16, p < .001, \phi = .23$ , respectively. In addition, for both men and women, participants whose partners completed the survey were significantly younger ( $M = 29.80, SD = 10.04$  versus  $M = 36.66, SD = 10.70$  for the men;  $M = 28.61, SD = 9.51$  versus  $M = 31.67, SD = 8.97$  for the women),  $F(1, 266) = 26.61, p < .001$  for the men and  $F(1, 293) = 7.01, p = .001$  for the women. Their relationships were also significantly shorter ( $M = 4.53, SD = 5.6$  versus  $M = 8.58, SD = 8.37$  for the men;  $M = 4.53, SD = 5.6$  versus  $M = 6.61, SD = 6.2$  for the women),  $F(1, 266) = 22.67, p < .001$  for the men and  $F(1, 293) = 10.86, p = .001$  for the women. None of the other differences were significant.

## Measures

**Background questionnaire.** Participants completed a background questionnaire that assessed sociodemographic data, including age, relationship status (noncohabiting, common law, married), residence (rural, urban), relationship duration, education (primary school, secondary school, undergraduate degree, master's degree, doctorate), and religiosity (religious, nonreligious).

**Sexual functioning.** We used the International Index of Erectile Function (IIEF; Rosen et al., 1997) to assess men's sexual functioning. The IIEF is a multidimensional 15-item self-report questionnaire that assesses key dimensions of men's sexual functioning during the previous four weeks. Its five subdomains are erectile function (six items), orgasmic function (two items), sexual desire (two items), intercourse satisfaction (three items), and overall satisfaction (two items). Only the desire, erectile function, and orgasm function subscales were used in the current study. Responses range from 1 (e.g., *Almost never*) to 5 (e.g., *Always*), with higher scores indicating better sexual functioning. Due to diversity in the number of items in each subscale, total scores vary for each subscale. Sexual desire

and orgasm total scores range from 2 to 10, and erectile function from 1 to 30. Participants also had the option of indicating that they did not engage in sexual activity. The questionnaires have been validated in 10 languages, and both the total scale and the subscales have proven to have good reliability and to be able to differentiate clinical from nonclinical samples (Quinta Gomes & Nobre, 2014). In the current study, Cronbach's alpha was .70 for the sexual desire domain, .90 for the erectile function domain, and .83 for the orgasmic function domain.

We used the Female Sexual Function Index (FSFI; Rosen et al., 2000) to assess women's sexual functioning during the previous four weeks. The FSFI is a 19-item self-report instrument that assesses key dimensions of sexual functioning in women, including sexual desire (two items), arousal (four items), lubrication (four items), orgasm (three items), satisfaction (three items), and pain (three items). In the current study the desire, lubrication, and orgasm subscales were used because these scales are comparable to the IIEF scales available for the men. Scores for each item range on a scale from 1 (e.g., *Almost never*) to 5 (e.g., *Always*), with higher scores indicating higher levels of sexual functioning. Participants were also given the option of indicating that they had not engaged in sexual activity in the previous four weeks. The FSFI has been validated in community as well as in clinical samples of women in several countries, including Portugal, where the total scale and subscales had good reliability for the total scale and the subscales (Pechorro, Diniz, Almeida, & Vieira, 2009). In the current study, the Cronbach's alphas were .81 for the desire subscale, .94 for lubrication, and .92 for orgasm.

**Sexual satisfaction.** Sexual satisfaction was assessed with the Global Measure of Sexual Satisfaction (GMSEX), a measure of satisfaction with the sexual relationship with a partner (Lawrance, Byers, & Cohen, 2011). The stem reads: "Overall, how do you describe your sexual relationship with your partner?" Participants then rated their current sexual satisfaction on five 7-point bipolar scales (e.g., *Very bad* to *Very good*). Total scores range from 5 to 35, with higher scores indicating greater sexual satisfaction. Lawrance et al. (2011) provided evidence for the internal consistency, test-retest reliability, and validity of the GMSEX. The measure has also been shown to be valid in various Portuguese samples (Pascoal, Narciso, Pereira, & Ferreira, 2013). Mark, Herbenick, Fortenberry, Sanders, and Reece (2013) concluded that the GMSEX is the most psychometrically sound measure of sexual satisfaction for mixed-sex couples, compared with two other commonly used scales and with a single-item measure of sexual satisfaction. In the current study, the Cronbach's alpha for the men was .94 and for the women was .93.

## Procedure

After institutional ethical approval of the study, the survey was tested, on a Web platform, with 20 volunteers who commented on the structure, comprehension, and aesthetic characteristics of the survey. Their comments were used to revise the survey. Participants were recruited for a study of predictors

of sexual satisfaction in couples, and the data we report here are from that larger project. Prior to giving informed consent, participants were provided with information regarding the aims, nature of the questions, inclusion and exclusion criteria, confidentiality, and funding source. Participants were informed that the study was aimed at couples and that they and their partners would have to both be willing to participate and answer the survey independently. Participants who gave consent were given instructions about how to generate a unique code that would protect their confidentiality but also allow the researchers to relate their answers to those of their partners. On average, the survey took 24 minutes to complete. No compensation was provided for participants. Data were collected online from October 2013 to January 2014.

### Data Analysis

As the sexual functioning scales for the male and female measures had different ranges, we first standardized all scores separately by gender. This ensured the predictors had the same metric, allowing gender comparisons of the path coefficients. To determine the degree of nonindependence we examined the zero-order correlations between men's and women's sexual satisfaction (Kenny et al., 2006). A large correlation was found (see Table 1), suggesting that men's and women's scores were interdependent.

We used structural equation modeling (SEM) to examine our data. All SEM analyses were conducted with Mplus 7. Models were estimated using a robust maximum likelihood estimator due to the violation of multivariate normality (Mardia's  $\chi^2 = 744.05$ ,  $p < .001$ ) (Hoyle, 2012; Korkmaz, Goksuluk, & Zararsiz, 2014; Wang & Wang, 2012). To assess model fit, we used the following criteria: comparative fit index (CFI) and Tucker-Lewis index (TLI)  $> .90$ , root mean square error of approximation (RMSEA)  $< .08$ ; RMSEA 90% confidence interval (CI)  $\leq .10$  (Hu & Bentler, 1998; Wang & Wang, 2012).

In keeping with the recommendations of Hoyle (2012) and Kline (2016), the analyses were conducted in a series of steps. First, we tested two alternative models. The individual model

included only paths from own sexual functioning dimensions (i.e., desire, lubrication/erection, orgasm) to own sexual satisfaction (see Figure 1a). The dyadic model (i.e., APIM) included paths from each partner's sexual functioning dimensions to both own and the partner's sexual satisfaction (see Figure 1b). These two models were compared on their fit indices and percentage of variance explained using the chi-square difference test. The model with better fit was then used to examine gender differences and actor and partner effect differences. To examine gender effects, the parameters representing actor and partner effects were constrained to be equal for men and women. Using the chi-square difference test, we compared the model with all the parameters freely estimated and the model with the parameters constrained to be equal between men and women. A significant chi-square test indicated that the baseline model was better and, therefore, that there were differences between the strength of the associations for men and women. A similar procedure was used to examine whether the actor and partner effects were similar in strength.

### Results

The means and standard deviation for all variables are presented in Table 1. On average, both the men and women reported high sexual satisfaction and high levels of sexual desire, lubrication/erection, and orgasm. According to the cut-off scores for diagnosing the presence of erectile problems in men (a score under 25 on the erection domain of the IIEF) and sexual dysfunction in women (a total FSFI score under 26.55), 11.2% of the men met the criteria for erectile dysfunction and 14.7% of the women did so for sexual dysfunction. Inspection of the zero-order correlations indicated that the men's sexual satisfaction was positively and significantly correlated with all of the domains of their own and their partners' sexual functioning (see Table 1). Women's sexual satisfaction was significantly correlated with all the domains of their partners' sexual functioning but only with men's erectile functioning. Men's and women's sexual satisfaction were also significantly correlated.

**Table 1.** Zero-Order Correlations, Means, and Standard Deviations for Men's and Women's Sexual Satisfaction, Desire, Lubrication/Erection, and Orgasm

	1	2	3	4	5	6	7	8
1. Women's sexual satisfaction	—	.47***	.37***	.36***	.53***	.07	.18*	.05
2. Women's desire		—	.42***	.24**	.38***	.11	.12	.02
3. Women's lubrication			—	.27**	.27**	.03	.02	.08
4. Women's orgasm				—	.26**	.28**	-.03	.02
5. Men's sexual satisfaction					—	.12	.34***	.11
6. Men's sexual desire						—	.21*	.21*
7. Men's erectile function							—	.33***
8. Men's orgasmic function								—
Mean	30.40	4.63	5.41	4.79	30.58	8.63	28.60	9.40
Standard deviation	4.76	1.01	0.84	1.23	5.08	1.32	2.41	1.05

Note.  $N = 124$ .

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

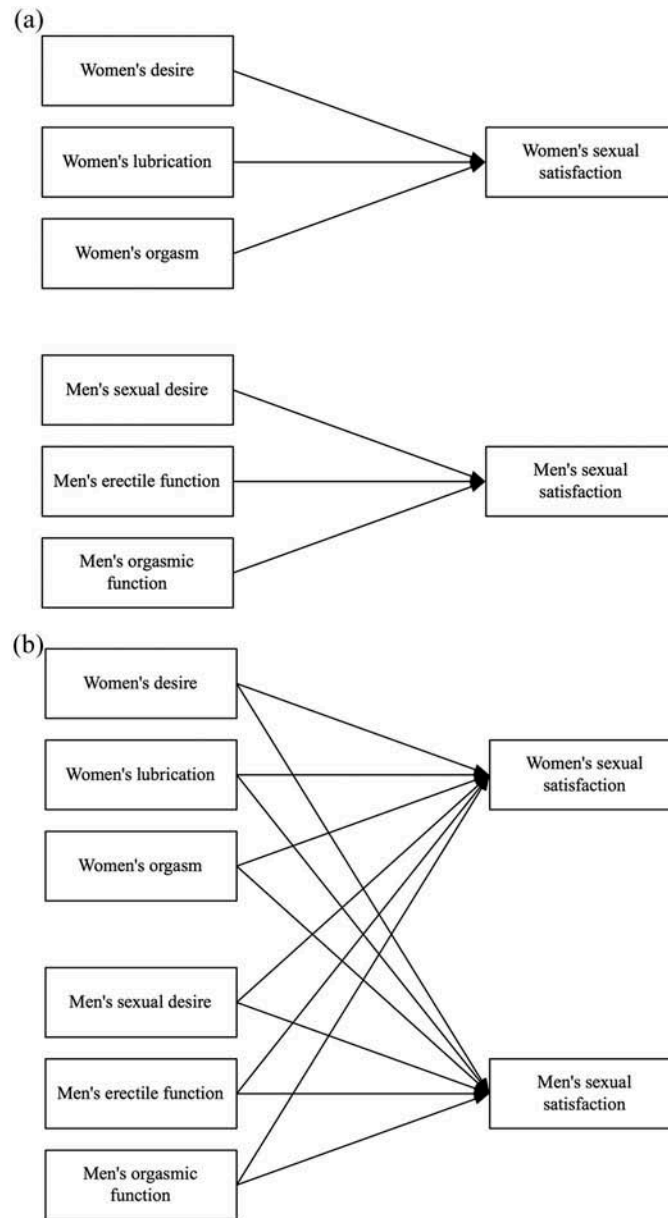


Figure 1. (a) Actor effects model; (b) actor-partner interdependence model (APIM).

### Testing Models of Couple's Sexual Satisfaction

To investigate hypothesis 1, we examined a structural model that included only actor effects (individual model). In this model, women's greater sexual satisfaction was predicted by their own higher sexual desire and orgasm; men's sexual satisfaction was predicted by their own greater erectile function (see Figure 2). This model explained 18.6% of women's sexual satisfaction and 6.1% of men's sexual satisfaction. However, the model did not fit the data,  $\chi^2(6) = 26.06$ ,  $p < .001$ , CFI = .742, TLI = .442, RMSEA = .164, 90% CI RMSEA = [.10 to .23]. Furthermore, the Wald statistic for model modification was not significant,  $\chi^2(1) = 2.70$ ,  $p = .44$ . Thus, we made no further changes to the model.

We examined hypothesis 2 by testing a structural model that included both actor and partner effects—that is, the dyadic (APIM) model. Women's and men's greater sexual satisfaction were predicted by women's higher sexual desire and orgasm and by men's greater erectile function (see Figure 3). This model included all potential effects (i.e., was a saturated model) and thus the fit was perfect,  $\chi^2(0) = 0$ ,  $p < 1$ , CFI = 1.00, TLI = 1.00, RMSEA = .00, 90% CI RMSEA = [.00 to .00]. Because the model included nonsignificant paths, we conducted model modification. All univariate Wald statistics were nonsignificant, ( $p > .05$ ), indicating that all nonsignificant paths could be fixed to zero without substantial loss in model fit. Fixing nonsignificant paths to zero did not worsen the overall model fit, as

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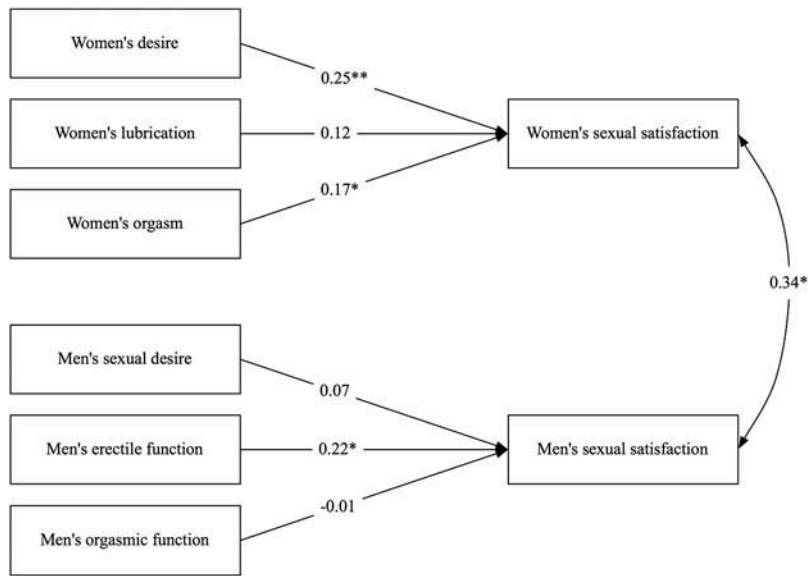


Figure 2. Results of the individual model; \* $p < .05$ ; \*\* $p < .01$ .

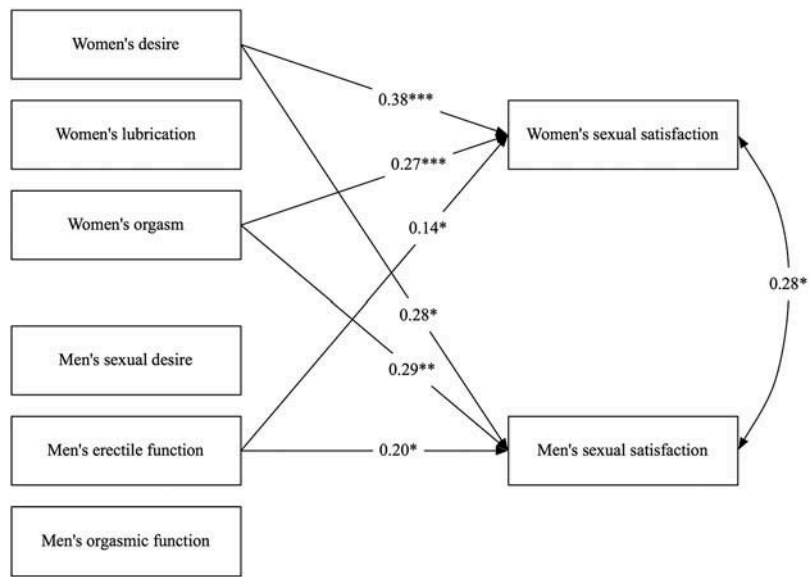


Figure 3. Results of the dyadic actor-partner interdependence model; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

suggested by the Satorra-Bentler scaled chi-square difference,  $\chi^2(6) = 5.04, p = .53$ . Therefore, considering that both dyadic models (i.e., saturated and modified) had the same fit, we opted to retain the most parsimonious one,  $\chi^2(6) = 5.04, p = .53, CFI = 1.00, TLI = 1.00, RMSEA = .00, 90\% CI RMSEA = [.00 to .10]$ . This model explained 30.4% of the variance in women's sexual satisfaction and 24.7% of the variance in men's sexual satisfaction.

We then compared the individual model and the dyadic model (hypothesis 3). Given that the actor effects model did not fit the data and that the dyadic model explained a larger percentage of variance, we can conclude that the dyadic model is a better model to predict couples' sexual satisfaction. We

could not conduct the chi-square difference test because both the individual and the dyadic models had the same degrees of freedom.

**Examining Gender and Actor-Partner Effects Differences**

Gender differences could not be calculated (research question 1) because the retained predictors for the women were different than the retained predictors for the men. Instead, we calculated differences in actor and partner effects (research question 2). The results showed that the actor and partner effects were not significantly different for women's sexual



desire,  $\chi^2(1) = 1.10, p = .29$ ; women's orgasm,  $\chi^2(1) = 0.35, p = 0.55$ ; and men's erectile ability,  $\chi^2(1) = 1.92, p = 0.16$ . The averaged unstandardized effects were 0.34, 0.24, and .21, respectively, indicating that women's sexual desire, women's orgasm, and men's erectile functioning had similarly positive effects on women's and men's sexual satisfaction. The final model with the actor and partner effects constrained to be equal adequately fit the data,  $\chi^2(9) = 8.71, p = .46, CFI = 1.00, TLI = 1.00, RMSEA = .00, 95\% CI RMSEA = [.00 to .10]$ , and explained 27.7% of the variance in women's sexual satisfaction and 26.1% of the variance in men's sexual satisfaction.

## Discussion

The presented study extended research done with individuals (Fisher et al., 2015; Heiman et al., 2011; Mark & Murray, 2012; Muehlenhard & Shippee, 2010; Rosen et al., 2016) by examining the reciprocal influence of men's and women's sexual functioning on both partners' sexual satisfaction. Based on interdependence theory (Van Lange & Balliet, 2015), we hypothesized that couple sexual satisfaction would be better explained by a dyadic model than by an individual model, and this prediction was supported. This suggests that to fully understand the impact of dimensions of sexual functioning on the sexual satisfaction of individuals in mixed-sex committed relationships it is important to take the experiences of both partners into account. These results provide general support for models that highlight one or more aspects of interdependence among partners as influencing individuals' satisfaction with sex (e.g., Basson, 2000; Byers et al., 2004; Lawrence & Byers, 1995; Metz & McCarthy, 2007; Tiefer et al., 2002). They are also in keeping with research that has shown the associations between self-disclosure, intimacy, and sexual frequency on couple sexual satisfaction are better explained by taking both partners' experiences into account (Rehman, Janssen, et al., 2011; Rubin & Campbell, 2012; Yucel & Gassanov, 2010).

### Sexual Functioning and Couple Sexual Satisfaction

We found that both men's and women's sexual satisfaction were associated with both their own and their partners' sexual functioning. In contrast, Fisher et al. (2015) showed that men's but not women's sexual satisfaction was best explained by a dyadic model, using a global measure of sexual functioning and a dichotomous measure of sexual satisfaction with unknown psychometric properties. The results of the present study, using validated measures, provide evidence for dyadic influences on both men and women when domains of sexual functioning are taken into account.

Furthermore, we found that the same sexual functioning domains—women's sexual desire, women's orgasm, men's erectile function—were associated with men's and women's sexual satisfaction and that the magnitudes of the actor and partner effects were similar for men and women. This suggests that men and women are more similar than different in terms of

factors that influence their sexual satisfaction. This finding is in line with a study by Byers and MacNeil (2006) that failed to find differences between men and women in the magnitude of the associations between sexual rewards and sexual costs, the balance between and equality of sexual rewards and costs, relationship satisfaction, and sexual satisfaction (Byers & MacNeil, 2006). Alternatively, this finding may reflect similarity within dyads (De Jong & Reis, 2014). That is, in developing a mutually satisfying sexual script, partners may grow to be sensitive to each other's experiences, perhaps through sexual communication, and thus to be influenced by the same factors (MacNeil & Byers, 2009). Either way, our results suggest that lower sexual functioning has a similar adverse effect on the sexual satisfaction of both partners. This underscores that, to promote sexual satisfaction, it is important that clinicians assess domains of sexual functioning of both partners.

The amount of variance explained by the model is similar but moderate, for both the women (27%) and the men (26%). This is consistent with a multifactorial approach that postulates sexual satisfaction is explained by a complex set of dimensions (e.g., mutuality, pleasure, creativity, relationship satisfaction) for both men and women (Pascoal, Narciso, & Pereira, 2014). Research is needed to identify other dimensions that influence sexual satisfaction over and above sexual functioning.

### Sexual Functioning Domains

The results add to our understanding of the specific domains of sexual functioning most closely associated with sexual satisfaction, at least in this sample of mostly sexually satisfied couples. Specifically, we found that women's desire and orgasm and men's erectile function emerged as significant positive predictors of both partners' sexual satisfaction. These results are particularly meaningful because, in contrast to previous research (e.g., Heiman et al., 2011), we controlled for all the possible associations between own and partner's variables.

With respect to sexual desire, there is considerable research showing that, on average, in mixed-sex couples male partners want to engage in sexual activity more frequently than their female partners (Peplau, 2003). Perhaps women who identify as having better functioning in the desire domain have a smaller (or no) discrepancy between their own and their male partners' level of sexual desire. As such, there would likely be fewer disagreements about engaging in sexual activity, more sexual initiations by the women, and fewer instances in which the women would engage (or feel pressure to engage) in sexual activity without desire. The lower discrepancy in desire levels (perceived or real), in turn, likely results in higher sexual satisfaction for both partners (Mark & Murray, 2012). Gender differences in sexual desire would also explain why in the present study, men's lower sexual desire was not associated with either partner's sexual satisfaction: Lower sexual desire in men would also likely result in a lower desire discrepancy between partners (Mark, 2012).

Consistent with research that has shown orgasm is associated with men's and women's sexual satisfaction (Fisher et al., 2015; Fugl-Meyer et al., 2006; Heiman et al., 2011; Muehlenhard &

Shippee, 2010) we found that women's orgasm was associated with both partners' sexual satisfaction. In contrast to previous findings that men's orgasm is associated with men's sexual satisfaction (Paduch, Bolyakov, Polzer, & Watts, 2013), we found men's orgasm to be unrelated to either partner's sexual satisfaction. Given that orgasm occurrence during heterosexual sexual interactions is substantially lower in women than in men (Laumann, Paik, & Rosen, 1999; Richters, de Visser, Rissel, Smith, 2006; Wade, Kremer, & Brown, 2005), this discrepancy may reflect this "orgasm gap," with women's orgasm, as a less likely event, therefore being more highly appreciated than men's orgasm. In support of this argument, a qualitative study in 33 North American heterosexual women aged 19 to 60 showed that the women felt it was self-evident that their partner had an orgasm to satisfy his own sexual needs (Nicolson & Burr, 2003). The woman's own orgasms, however, were regarded as a token of dedication toward the partner, to make him feel that he is a good lover. The importance of women's orgasm for men may reflect the overall health and well-being of the relationship, particularly around entitlement to pleasure (Fahs, 2014). Fahs (2014) showed that in relationships where women felt insecure, uncertain, or overconcerned about their partners' feelings, faking orgasm occurred more often. Similarly, in a focus-group study, Salisbury and Fisher (2014) found that both young women and men identified women's orgasm as important to men's sexual satisfaction, whereas women dismissed the importance of orgasm for their own sexual satisfaction. Consistent with another recent study (Chadwick & van Anders, 2017), men revealed that the primary importance of the female orgasm for men rested on the sense of personal accomplishment they felt after having "given" their female partners an orgasm. Thus, albeit for different reasons, these combined findings suggest that women's orgasm plays a central role in the sexual satisfaction of both men and women.

Consistent with research with clinical samples (Cayan et al., 2004; Mulhall et al., 2008; Pakpour et al., 2015), we found that men's erectile functioning was associated with both men's and women's sexual satisfaction. This may be because the heterosexual sexual script and men's and women's beliefs about sexual function and satisfaction almost invariably include penile-vaginal intercourse (Letts, Tamlyn, & Byers, 2010; Pascoal, Alvarez, Pereira, & Nobre, 2017). Thus, couples may have difficulty feeling satisfied with sexual interactions that do not include penile-vaginal intercourse. In contrast, women's lubrication did not emerge as a unique contributor to either partner's sexual satisfaction, although it was associated with both men's and women's sexual satisfaction on the bivariate level. A review of the literature revealed no studies that examined the relationship between lubrication and sexual satisfaction. This suggests that as long as women experience desire and reach orgasm, couples' sexual satisfaction is not impacted by the extent to which they show this physiological aspect of arousal. This may be because couples attend to other aspects of arousal more so than lubrication, or because couples routinely use lubricants during lovemaking (Jozkowski et al., 2013).

## Limitations and Conclusions

These results must be considered in light of some of the limitations of the study. First, our sample mainly consisted of urban, highly satisfied, and highly educated Portuguese individuals who were on average fairly new to their relationships. Furthermore, both members of the couple had to agree to participate, and the percentage of people whose partners did not participate was high. Compared to people whose partners did not participate, those whose partners did participate were younger, had shorter relationships, and were more often living with their partners. Thus, the extent to which the results are generalizable to couples with other characteristics, particularly older couples, couples in longer relationships, dissatisfied couples, and couples experiencing a sexual disorder, is not known. Third, we assessed both partners' perceptions of their own sexual functioning. However, some research suggests that perceptions of one's partner impacts one's own actual experience (Kenny & Acitelli, 2001). Thus, as well as assessing participants' own functioning, future research should include perceptions of partners' functioning. Fourth, although we included three important domains of sexual functioning, other domains were not examined (e.g., pain, subjective arousal). Research is needed that includes all sexual functioning domains, using psychometrically sound measures that are suitable for partnered men and women, when these become available (Basson et al., 2015). Finally, because of our sample size, we could not assess whether the relationships between sexual functioning and sexual satisfaction were influenced by couple characteristics (e.g., type of relationship, sexual communication, relationship satisfaction). Research is needed with sufficient power to analyze for potential moderation. Nonetheless, using a dyadic approach we demonstrated that, in mixed-sex couples, domains of both men's and women's sexual functioning are associated with both partners' sexual satisfaction. These findings have implications for both researchers and clinicians. They suggest it is important for researchers to use the couple as the unit of analysis in sexual satisfaction research. Similarly, they suggest it is important for clinicians to consider the impact of sexual function problems in either partner on both members of the couple. Finally, the results support a gender-similarity hypothesis (Hyde, 2005) rather than a gender-differences hypothesis by demonstrating that the same aspects of sexual functioning affect both men's and women's sexual satisfaction in mixed-sex couples. It is important for educators to counter the common discourse highlighting gender differences in sexual satisfaction by pointing to these and other gender similarities (e.g., Lawrence & Byers, 1995).

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