Sexual Desire Inventory: Two or Three Dimensions?

Abstract

The Sexual Desire Inventory (SDI), developed by Spector et al. in 1996, has been widely used to assess sexual desire in men and women throughout the world. This questionnaire categorizes sexual desire in two dimensions: dyadic sexual desire and solitary sexual desire. Our study addressed the factorial structure of the SDI, an aspect that until now has been largely neglected. Therefore, we recruited two samples of Spanish men and women involved in a stable heterosexual relationship. The first sample consisted of 3,417 subjects (1,600 males and 1,817 females) of ages 18−84, and the second sample consisted of 677 subjects (285 males and 392 females) of ages 18−50. The results of an exploratory factor analysis (EFA) showed instead of two dimensions, the SDI should have three: (i) partner-focused dyadic sexual desire; (ii) general dyadic sexual desire for an attractive person; (iii) solitary sexual desire. A confirmatory factor analysis (CFA) supported the robustness of this new three-factor structure. No gender differences were revealed, except for dyadic sexual desire for an attractive person, for which men reported higher scores. Good validity and reliability values were obtained. Moreover, standard scores for men and women by different age groups were developed.

Keywords. Sexual Desire Inventory; factor structure; validity; standard scores.

Sexual Desire Inventory: Two or Three dimensions?

Since sexual desire is a complex construct (Bancroft, 2009), it has been variously defined. Kaplan (1977) conceptualizes desire as sensations that motivate individuals to initiate or be receptive to sexual stimulation. According to Regan and Berscheid (1999), sexual desire is "a psychological state subjectively experienced by the individual as an awareness that he or she wants or wishes to attain a (presumably pleasurable) sexual goal that is currently unattainable" (p. 15). Still another perspective is provided by Levine (2003), who states that sexual desire is the "sum of the forces that lean us toward and away from sexual behavior" (p. 285). Taken together, sexual desire was regarded as the motivation to engage in sexual activity (Diamond, 2004), either alone or with a partner (Regan, 2013), which may be triggered by both internal and external cues (Leiblum & Rosen, 1988). Although most research conceives sexual desire as unitary, sexual desire has a multidimensional nature (Toledano & Pfaus, 2006).

One of the instruments most frequently used to evaluate sexual desire is the Sexual Desire Inventory (SDI) (Spector, Carey, & Steinberg, 1996). Spector et al. (1996) define sexual desire as "interest in sexual activity, which can be measured by amount and strength of thought directed toward sexual stimuli" (p. 178). The SDI consists of 14 items that measure two dimensions: (i) dyadic sexual desire (items 1-9), and (ii) solitary sexual desire (items 10-13). Item 14 does not belong to either dimension, because it refers to the length of time that the subject can feel comfortable without having sexual activity of any kind. As underlined by Spector et al. (1996), "dyadic sexual desire refers to interest in or a wish to engage in sexual activity with another person. Dyadic desire

may also involve a desire for intimacy and sharing with another" (p.186) (i.e. *How strong is your desire to engage in sexual activity with a partner?*). According to these authors, "solitary desire refers to an interest in engaging in sexual behavior by oneself, and may involve a wish to refrain from intimacy and sharing with others" (p. 186) (i.e. *How strong is your desire to engage in sexual behavior by yourself?*). For most of the questionnaire items, respondents rate their sexual desire on an 8-point Likert scale. However items 1, 2, and 10 focus on sexual desire in the context of the previous month, and are rated on a 7-point Likert scale.

The original SDI conceives sexual desire as having two dimensions: dyadic sexual desire and solitary sexual desire. This is the theoretical basis for the original questionnaire, which was developed as follows: (1) items were selected by considering theoretical models of desire as well as clinical experience in assessing sexual desire disorders; (2) based on exploratory factor analyses, items were eliminated or reworded to measure either dyadic sexual desire (interest in behaving sexually with a partner) or solitary sexual desire (interest in behaving sexually by oneself). The authors eliminated items 9 and 13 because they did not measure the quantity of sexual desire, but rather of perceived sexual desire in comparison to peers. Although the final result was an 11-item version SDI, most researchers use the 13-item SDI. In this version, items 1−9 are summed to obtain the dyadic sexual desire score (ranging from 0 to 70), whereas items 10−13 are summed to obtain the solitary sexual desire score (ranging from 0 to 31). Total sexual desire is measured by adding the scores of both dimensions. The resulting score (0− 101) is indicative of the subject's level of sexual desire. A higher score reflects a higher level of desire.

Psychometric properties based on the 11-item SDI version have been provided from several samples, such as students (N = 380) (Spector et al., 1996); individuals living in geriatric long-term care facilities (N = 40) (Spector & Fremeth, 1996); and

couples (N = 40) (Spector & Davies, cited by Spector, Carey, & Steinberg, 1998). These research studies highlight the relationship between dyadic and solitary sexual desire even though they are different constructs (*r* = .35). In addition, these studies also provide proof of the validity of the SDI. More specifically, previous research demonstrated strong concurrent validity between solitary sexual desire scores and the frequency of solitary sexual behavior, and with erotophilia. In contrast, dyadic sexual desire scores correlated with the frequency of partnered sexual behavior (Spector et al., 1996). Sexual desire was also found to converge with various related measures of sexual motivation (King & Allgeier, 2000), and with physiological responses to sexual stimuli (Giargiari, Mahaffey, Craighead, & Hutchison, 2005). Test-retest reliability was relatively high at *r* = .76, as calculated over a one-month period (Carey, 1995, cited by Spector et al., 1998). Cronbach's alpha values were .86 and .96 for the dyadic and solitary dimension, respectively. Nevertheless, to date, the factorial structure of the SDI has only been tested by confirmatory factor analysis (CFA) in a nonclinical sample of Spanish men and women (N = 608) (Ortega, Zubeidat, & Sierra, 2006) within the context of the original two-factor structure. The results obtained reflected a good level of internal consistency reliability. However, this analysis was performed on the pre-established two-factor structure.

There are a number of conceptual and methodological questions regarding the two-factor structure of the SDI. Despite the strong theoretical support for these two different but related dimensions of sexual desire (Moyano & Sierra, 2014; Spector et al., 1996; van Anders, 2012), they may not be sufficient to completely capture certain aspects of sexual desire. First of all, a distinction should be made between desire as an intrinsic personal characteristic as opposed to one that is susceptible to fluctuation. In this sense, Sarin, Amsel and Binik (2013) suggest that although an individual may have little desire to engage in sexual activity with his/her partner, he/she may still experience

pleasurable thoughts or fantasies about sexual activity that are independent of his/her current relationship. In regards to female sexual desire, Puts and Pope (2013) also observe that many sexual aspects of desire are not only related to intrinsic personal characteristics of the women themselves, but also to aspects of their sexual environment, including characteristics of their romantic partners. In addition, recent conceptualizations of female sexual responsiveness reflect that a woman's feelings for her partner are a strong predictor of desire (Dennerstein, Lehert, & Burger, 2005; Goldmeier, 2001).

Furthermore, research using the SDI suggests that the dyadic dimension could have two subcomponents. In particular, Holmberg and Blair (2009) observed that most dyadic factor items focus on the partner (e.g. *During the last month, how often have you had sexual thoughts involving a partner?).* However, there are two items that mention an attractive person (e.g. *When you first see an attractive person, how strong is your sexual desire?*). For this reason, their study distinguishes between dyadic sexual desire for one's partner and dyadic sexual desire for an attractive person. Both subscales obtained good reliability values (α = .84 and .89, respectively). More recently, Roberts et al. (2013) analyzed research studies on whether oral contraceptives and MHC allele are associated with a woman's sexual preference for her partner as opposed to her sexual preference for other men. In their review, these authors distinguish between general desire and partner-focused desire despite the fact that this distinction has rarely been mentioned in previous clinical research.

Finally, Spector et al. (1996) conducted exploratory factor analysis on the SDI. Although the psychometric properties of the SDI are sound, the structure confirmation in additional samples is needed. Therefore, we aimed to perform other statistical procedures such as CFA, a multivariate statistical procedure used to test whether data fit

a measurement model. We thus considered that CFA was of relevance for calculating the adequacy of the model (Byrne, 2013).

Previous research depicts strong gender differences in sexual desire. For example, in reference to solitary activities, such as masturbation or casual sex men usually report higher levels of desire than women (Baumeister, Catanese, & Vohs, 2001; Oliver & Hyde, 1993). Regarding dyadic desire, some variations have been observed. That is, gender differences diminish considerably when the desire is for sexual activity with one's partner (e.g. Davies, Katz, & Jackson, 1999, Holmberg and Blair, 2009). Furthermore, it has been found that for both sexes, relationship status attenuates and eliminates gender differences. Although in research using the SDI, men reported higher levels of sexual desire (van Anders, 2012), recent findings by Dawson and Chivers (2014) found no gender differences with the SDI or other measures of sexual desire. Considering that, presumably, the dyadic dimension from the SDI, may distinguish two different types of dyadic desire -partner-focused vs. towards an attractive person-, it is likely that specific aspects of gender differences in sexual desire will emerge.

The Current Study

So far, the factorial structure of the SDI has not been analyzed with both an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA). To fill this gap, we decided to recruit two samples of Spanish men and women involved in a stable heterosexual relationship. Two studies were carried out with these samples. In Study 1, we conducted an EFA on the 13-item SDI. In Study 2, a CFA was performed, and further evidence of validity was obtained from the better fitted model. Gender differences in the SDI factors were also examined. Finally, we provided reliability values (Cronbach´s alpha) and standard scores for Spanish men and women in three age

groups (18−34, 35−49, and 50 years and older), which can be useful for clinical and epidemiological assessments.

To obtain evidence of validity, we assessed the following: (i) sexual cognitions regarding intimate and exploratory content; (ii) sexual excitation/inhibition; and (iii) sexual satisfaction. As shown in previous research, a higher overall frequency of erotic thoughts, fantasies, and cognitions is associated with higher levels of dyadic and solitary sexual desire (Balon & Segraves, 2005; Graham, 2010; Hurlbert, Apt, Hurlbert, & Pierce, 2000; Moyano, Byers, & Sierra, in press). We distinguished intimate and exploratory cognitions considering the following: (1) intimate sexual cognitions related to the search for and enjoyment of erotic and sexual interactions with a sexual partner; (2) exploratory sexual cognitions related to sexual variety, such as sexual group activities. Each type of sexual cognition is related to various aspects of sexuality, such as subjective sexual arousal (e.g. Carvalho, Quinta-Gomes & Nobre, 2013). Furthermore, intimate sexual cognition seems to have a stronger association with dyadic aspects of desire, whereas exploratory sexual cognition is more closely associated with solitary aspects of desire (Moyano et al., in press; Ortega et al., 2006; Santos-Iglesias, Calvillo, & Sierra, 2013).

Regarding sexual excitation/inhibition, we used the Dual Control Model (Bancroft & Janssen, 2000), which postulates that sexual arousal and associated behaviors depend on the balance between sexual excitation and inhibition. Sexual excitation (SE) is defined as the tendency to feel aroused, derived from social interactions. Sexual inhibition (SI), which is the propensity for detecting a threat and suppressing sexual response, is composed of two factors: (1) inhibition due to distraction/focus on sexual performance during sex (SI1); (2) inhibition due to the risk of getting caught and the risk of contracting a sexually transmitted infection (STI) (SI2). In a large sample of men and women, sexual excitation strongly correlated with the SDI

dimensions of dyadic desire and solitary desire, whereas SI2 showed a negative correlation (Winters, Christoff, & Gorzalka, 2008). Finally, sexual satisfaction refers to the affective response arising from a person's subjective evaluation of his/her sexual relationship (Lawrance & Byers, 1995). Therefore, sexual satisfaction is expected to be associated with dyadic aspects of desire.

Study 1: Exploratory Factor Analysis

Method

Participants and Procedure

A quota convenience sampling method was used to obtain a similar number of men (n = 1,500) and women (n = 1,500), distributed across different groups according to age (18−34, 35−49, and 50 years or older; 500 individuals per age group), size of the town or city of residence (a population less than or greater than 50,000; 250 individual per group), and geographical area (northern or southern Spain; 125 individuals per group). An initial sample of 3,956 subjects was recruited from the general Spanish population between 2009 and 2011. Out of these, 1,832 were men and 2,124 were women, with a mean age equal to 40,23 (SD = 13,65) However, 539 individuals were eliminated because of missing values in one or more items of the SDI, or absence of sociodemographic information (when questions regarding age, gender or relationship status were not answered). Therefore, data from 3,417 participants (1,600 men and 1,817 women) whose ages ranged from 18 to 84 was considered. All of the participants were Spanish and resided in Spain. They were also involved in a heterosexual relationship with duration of at least six months.

Questionnaires were completed through a pencil and paper version. Testing was conducted individually or collectively by trained researchers in public libraries, social centers, public institutions, and university classrooms. Participants in public places were directly approached by the researcher. In the particular case of university students, the

researcher contacted several lecturers and asked for permission to attend their classes in order to recruit participants. Students who agreed to participate completed the questionnaires in groups of 30 or fewer in an available classroom. Participants were sitting sufficiently far apart to ensure privacy.Study investigators explained to participants that the purpose of the study was to gain a better understanding of sexual health among Spanish adults. They did not receive any compensation. Before filling out the questionnaires, their informed consent was obtained. Other questionnaires were also administered related to sexual assertiveness, sexual functioning and sexual attitudes, which were part of a larger study. All the questionnaires were handed to them with an envelope. Anonymity was also guaranteed. Characteristics of the sample are summarized in Table 1.

Measures

Background questionnaire assessing gender, age, nationality, sexual orientation, relationship status and duration, educational level, and religious affiliation.

Spanish version of the Sexual Desire Inventory (SDI) (Spector et al., 1996) developed by Ortega et al. (2006) with information regarding the psychometric properties of the original and the Spanish validation provided in the Introduction.

Results

The results of Study 1 involving a sample of 3,417 individuals were as follows. Some SDI items showed violations of univariate and multivariate normality (skew = -2.00 to 0.40) and kurtosis (-1.24 to 4.37); Mahalanobis distance = 1.35 to 104.35, and Kolmogorov-Smirnov = 2.90, p = .000. Both the Kaiser–Meyer–Olkin Index of Sampling Adequacy (KMO= 0.85) and Bartlett's Test of Sphericity (χ^2 (78) = 28378.76; p <.001) indicated that the correlation matrix of the data was suitable for factor analysis. Factor analysis revealed the extraction of three factors using Maximum Likelihood

Factor Analysis (ML) with Varimax rotation, which accounted for 63.57% of the variance.

For all the factors, eigenvalues were higher than 1, and communalities ranged from .31 (item 6) to .78 (item 11). It was observed that seven items (1, 2, 3, 6, 7, 8, 9) loaded on the initial factor; four items (10, 11, 12, 13) loaded on the second factor; and two items (4, 5) loaded on the third factor. Factor 1 refers to partner-focused dyadic sexual desire (DSD-P). Similarly to Spector et al. (1996), Factor 2 refers to solitary sexual desire (SSD). The new Factor 3 proposed in this study is dyadic sexual desire for an attractive person (DSD-A). As shown in Table 2, factor loadings were significant and ranged from .55 to .89. Corrected item-total correlation scores for each factor ranged from .48 (item 6) to .88 (item 11). More information regarding the covariances for the SDI items can be required to the authors.

Study 2: Confirmatory Factor Analysis

Method

Participants and Procedure

In Study 2, 1,242 subjects were initially recruited. The study was announced through social networks (i.e., facebook, twitter) websites related to sexuality topics and several national digital newspapers, in which some news regarding the topic of sexuality was announced, and therefore the link to access to the survey was also provided. Recruitment lasted from May 2012 to February 2013. Study investigators explained to participants that the study aimed to examine some sexual thoughts and behaviors in Spanish population. All subjects signed an informed consent form in which inclusion criteria were established. They also received guarantees of anonymity and confidentiality, and were assured of their freedom to withdraw from the study whenever they wished. Therefore, they were requested to check a box indicating that they were willing to take part in the study and to complete an online version of the questionnaires.

The estimated completion time of the questionnaires was 30 to 45 minutes (see Table 1).

However, after filling out the survey, 149 people were eliminated because they did not comply with the inclusion criteria, and 416 more because of missing data in one or more of the questionnaires (one or more items from the SDI, absence of sociodemographic data regarding age, gender or relationship status, and approximately 25% of the other questionnaires) The total number of participants in Study 2 finally came to 677 (285 males and 392 females) with ages ranging from 18 to 50. All of the subjects were Spanish and resided in Spain. They were also involved in a heterosexual relationship of at least six months in duration.

Measures

Background questionnaire used in Study 1.

Spanish version of the Sexual Desire Inventory (SDI) (Spector et al., 1996) developed by Ortega et al. (2006).

Spanish version of the Sexual Cognitions Checklist (SSCC) (Renaud & Byers, 2011) developed by Moyano and Sierra (2012). The SSCC consisted of 28 items answered on a 7-point Likert scale ranging from 0 (*I've never had this thought*) to 6 (*I've had or have this thought frequently during the day*). The SSCC distinguishes between positive sexual cognitions (when thoughts are acceptable and pleasant), negative sexual cognitions (when they are unacceptable and unpleasant), and their specific content, which can be intimate, exploratory, sadomasochistic, or impersonal (Wilson, 1988). However, the only scores considered in our study were positive sexual cognitions with intimate content (e.g., *having intercourse with a loved partner)* and those with exploratory content (e.g., *participating in an orgy)*. Scores ranged from 0 to 54 for intimate cognitions and from 0 to 48 for exploratory cognitions. Higher scores indicated a higher frequency of sexual cognitions. The Cronbach's alpha values were

the following: intimate (α = .86 in men, α = .88 in women), and exploratory (α = .82 in men, α = .80 in women).

Spanish version of the Sexual Inhibition/Excitation Scales − Short Form (SIS/SES-SF) (Carpenter, Janssen, Graham, Vorst, & Wicherts, 2011; Moyano & Sierra, 2014). The SIS/SES-SF consisted of 14 items that assess propensity for sexual excitation (SE) and sexual inhibition (SI). The scale includes one sexual excitation scale (SE), and two sexual inhibition scales (SI1, SI2). The SES measures sexual excitation derived from social interactions (e.g. *When a sexually attractive stranger accidentally touches me, I easily become aroused).* SI1 includes items related to distraction/focus on sexual performance and past problems with arousal (e.g., *I cannot get aroused unless I focus exclusively on sexual stimulation).* In contrast, SI2 refers to the risk of getting caught or contracting an STI (e.g. *If I am having sex in a secluded, outdoor place and I think that someone is nearby, I am not likely to get very aroused).* The items are answered on a 4-point Likert scale which ranges from *strongly agree* (1) to *strongly disagree* (4). Following recommendations by Carpenter et al. (2011), scores in all of the items are reversed. This signifies that higher scores in the SE and SI factors indicate a higher propensity for sexual excitation and for sexual inhibition, respectively. Scores range from 6 to 24 for SE and from 4 to 16 for both SI1 and SI2. Evidence of validity and reliability were provided. Although some reliability values were low, they were similar to the test-retest values reported by Carpenter et al. (2011). In particular, in this study, Cronbach's alpha values were SE = .74 in men and .70 in women; SI1= .67 in men and = .64 in women; and SI2 = .64 in men and .60 in women.

Spanish version of the Global Measure of Sexual Satisfaction (GMSEX) (Lawrance, Byers, & Cohen, 2011) developed by Sánchez-Fuentes, Santos-Iglesias, Byers, & Sierra (2015) was used to assess the subject's overall sexual satisfaction with his/her partner. The respondents rated their sexual relationship on five 7-point

dimensions: *good–bad, pleasant–unpleasant, positive–negative, satisfying–unsatisfying,* and *valuable–worthless.* Overall scores ranged from 5 to 35. Higher scores indicated greater sexual satisfaction. Good internal consistency and validity were obtained. In this study, internal consistency was high (α = .93 for men and α = .92 for women).

Results

Three models were analyzed through CFA. The first model was the three-factor model derived from the EFA, containing partner-focused dyadic sexual desire (items 1, 2, 3, 6, 7, 8, 9), dyadic sexual desire for an attractive person (items 4, 5); and solitary sexual desire (items 10, 11, 12, 13). The second model was the original two-factor model containing dyadic sexual desire (1, 2, 3, 4, 5, 6, 7, 8, 9), and solitary sexual desire (10, 11, 12, 13) (Spector et al., 1996). Finally, the third model was a one-factor model.

Confirmatory analyses were conducted using the EQS 6.0 software package (Bentler, 2008). Given the violation of normality (Mardia = 37.39), data were analyzed by the Robust *Generalized Least Squares* (GLS) method, which generally performs well for non-normal distributions (Min, 2008). Fit indexes included: (i) the *Rootmean Square Error of Approximation* (RMSEA); (ii) the 90% confidence interval for RMSEA; (iii) the *Comparative Fit Index* (CFI); (iv) the *Bentler-Bonett Non-Normed Fit Index* (NNFI), also known as the Tucker-Lewis Index; (v) the *Akaike Information Criterion* (AIC); and (vi) the *Satorra-Bentler scaled chi-square* (S-B χ^2). RMSEA values lower than .06 indicate a good fit and values lower than .08, a reasonable fit (Hu & Bentler, 1999). Upper values for the 90% confidence interval of less than .08 also indicate a good fit. CFI and NNFI values greater than .90 are usually interpreted as indicators of acceptable fit (Kline, 2011) though Hu and Bentler (1999) have suggested that .95 is a better threshold. For both the AIC and the S-B χ^2, when models are compared, the best model is the one with a smaller criterion value.

The three-factor model showed a better fit (RMSEA = .06, 90% CI of RMSEA = .05−.07, CFI = .96, NNFI = .95, AIC = 104.43, S-B χ^2 = 222.42, *df* = 59) in comparison to the two-factor model (RMSEA = .11, 90% CI of RMSEA = .10 − .12, CFI = .88, NNFI = .86, AIC = 494.52, S-B χ^2 = 622.51, *df* = 64) and to the one-factor model (RMSEA = .13, 90% CI of RMSEA = .12− .14, CFI = .83, NNFI = .80, AIC = 763.82, S-B χ^2 = 893.82, *df* = 65). Figure 1 shows the path diagram of the three-factor structure. Standardized loadings ranged from .42 (item 6) to .88 (item 7). Correlations between the three factors were .34 between DSD-A and SSD; .01 between DSD-P and DSD-A; and .25 between DSD-P and SSD. Squared multiple correlations ranged from .17 (item 6) to .77 (item 8), with a mean SMC value of .63 indicating that, on average, 63% of the variance in the variables was accounted for by latent factors. No modification indices suggested to significantly improve the model fit.

Gender Differences in the Three-Factor Structure of the SDI

Student´s t-tests were also performed to examine gender-based differences in the three factors. Although men reported significantly higher DSD-A in comparison to women, no significant differences were found for either the DSD-P or SSD (see Table 3).

Evidence of Validity

Zero-order correlations were conducted to examine associations between the DSD in Spector et al. (1996), and each of the three factors derived from previous analyses: DSD-P, DSD-A, and SSD. In addition, we observed correlations between the three subscales of the SDI with various sexuality variables (see Table 4).

The original DSD factor was found to be very strongly associated with DSD-P (*r* = .83, *p* < .001 in men and .81, *p* < .001 in women), and moderately associated with DSD-A (*r* = .40, *p* < .001 in men and .43, *p* < .001 in women). Furthermore, higher

scores in the original DSD were significantly associated with higher values for intimate and exploratory sexual cognitions, sexual excitation and sexual satisfaction in both men and women, and also with lower SI1 and SI2 in women.

Regarding the three-factor structure, men who reported higher DSD-P also reported a higher frequency of intimate and exploratory sexual cognitions and greater sexual satisfaction. In women, higher scores for the DSD-P were associated with higher frequency of intimate cognitions, lower SI1 and SI2, as well as greater sexual satisfaction. In both men and women, higher scores for the DSD-A correlated with a higher frequency of exploratory cognitions, and more sexual excitation. In men, DSD-A was also associated with more SI1, and lower sexual satisfaction, whereas in women, DSD-A correlated with lower SI2. In both men and women, SSD was positively correlated with more intimate and exploratory cognitions and more sexual excitation. Only in women, was it also associated with lower SI2. In addition, correlations between desire for attractive other and SE obscured when attractive other and partner are combined. Also desire for attractive other correlated with solitary sexual behavior. This was obscured as well when partner and other are combined. Shortly, this three-factor structure provides relationships with other constructs that are stronger and with a more meaningful interpretation.

Reliability and Standard Scores

Participants

Data from both Study 1 and Study 2 were used to provide the internal consistency values through Cronbach´s alpha and standard scores for men and women as well as for different age groups: 18−34 years old (764 men and 980 women); 35−49 years old (676 men and 725 women); ≥ 50 years old (445 men and 504 women).

Results

Table 5 shows the standard scores obtained for the three factors for both men and women distributed along three age groups Therefore, comparisons are now likely to be provided based on a large non-clinical sample. Cronbach's alpha values are also shown in parenthesis. As can be seen, as their age increased, both male and female subjects tended to have lower scores for the three factors. That is, any type of sexual desire decreases as the subjects become older.

Discussion

This study examined the factor structure and psychometric properties of the SDI using both EFA and CFA procedures in a sample of Spanish men and women involved in a stable heterosexual relationship. Our findings suggest that the SDI best captures three dimensions of sexual desire instead of two. Using the EFA, a three-factor structure emerged, which accounted for 74.75% of the variance. Factor 1 contained items 1, 2, 3, 6, 7, 8, 9; Factor 2 contained items 10, 11, 12, 13; and Factor 3 contained items 4 and 5. CFA was used to ratify this three-factor model, which obtained a better fit, in comparison to the original two-factor model in Spector et al. (1996) and to a one-factor model, which both showed a poor fit (RMSEA > .10) (Browne & Cudeck, 1993). Therefore, we identified two distinct components within dyadic sexual desire, which led us to divide this dimension into two subcomponents. The first refers to partner-focused sexual desire, whereas the second refers to general sexual desire for an attractive person. These subcomponents are differentiated by items 4 and 5. Interestingly, the factor loadings in Spector et al. (1996), which are consistent with our results, reflect that items 4 and 5, corresponding to dyadic sexual desire, showed the lowest loading in the factor (.57 and .53, respectively). The three-factor SDI was found to have good psychometric properties as reflected by Cronbach's alpha values higher than .80, and concurrent evidence of validity.

Associations between each element of the three-factor structure and the original two-factor structure were also examined. Similarly, in both men and women, the original dyadic dimension in Spector's SDI correlated with the two dyadic dimensions that emerged in our study, as well as with the dimension of solitary sexual desire. In particular, the original dyadic dimension was very strongly associated with partner-focused sexual desire since it explained about 80% of the variance. It also explained approximately 40% of the variance for sexual desire for an attractive person, and 16–20% of the variance for solitary sexual desire. In addition, the associations between the three dimensions of sexual desire showed an interesting pattern for men and women. In men, the two dyadic dimensions (desire for a partner and desire for an attractive person) were not associated, whereas for women, there was a weak negative association. Therefore, even though both of these subdimensions are dyadic in that they both refer to sexual interaction with another individual, they are independent concepts.

Moreover, partner-focused sexual desire was not associated with solitary sexual desire in either men or women. This is in contrast to Spector et al. (1996), in which these dimensions were found to be related (r = .35). In contrast, our findings indicated that sexual desire for an attractive person was associated with solitary sexual desire (r = .31 in men and r = .26 in women). This result confirms that that they are distinct but related categories. Therefore, the association between the dimensions of dyadic and solitary sexual desire in Spector et al. (1996), might be better explained by those items pertaining to feeling sexual desire for an attractive person, and not by the partner-related items.

The results of the zero-order correlation analysis highlighted that both men and women who reported a greater interest in sex with their partner, also reported experiencing more intimate sexual cognitions and felt more sexually satisfied. In the same way as in other research, our study found that having intimate thoughts was a

strong predictor of greater dyadic sexual desire (Zubeidat, Ortega, del Villar, & Sierra, 2003). Moreover, this finding provides further evidence of the link between sexual satisfaction and the subcomponents proposed for dyadic sexual desire (Sánchez-Fuentes, Santos-Iglesias, & Sierra, 2014). In the case of the male subjects, a higher level of dyadic sexual desire for their partner was also associated with more frequent exploratory sexual cognitions. Although exploratory cognitions do not refer to dyadic activities but rather to sexual group activities, this association might indicate that men tend to fantasize about sex more than women (Leitenberg & Henning, 1995).

Our results also go beyond previous research findings by showing that women, (though not men), who are more interested in having sex with their partner are less likely to have inhibited sexual response in the face of performance concerns or fear of performance consequences like STI and being caught. This is true for inhibition derived from distractions during sex (SI1), as well as for other threatening factors (SI2). This functional aspect of partner-desire is in line with the Dual Control Model (Bancroft, Graham, Janssen, & Sanders, 2009), which postulates that individuals with a high propensity for sexual inhibition are more likely to develop sexual dysfunction, such as low sexual desire (Bancroft, 1999; Prause, Janssen, & Hetrick, 2008). Our study showed that for both men and women, sexual desire for an attractive person and solitary sexual desire were strongly associated with having frequent exploratory cognitions and with a high propensity to become sexually aroused. Intimate sexual cognitions were also positively associated with solitary sex.

Although previous research has shown sexual excitation to be strongly correlated with both the dyadic and solitary dimensions of the SDI (Janssen, Vorst, Finn, & Bancroft, 2002), the results of our study found that male and female sexual excitation was only associated with solitary desire and desire towards an attractive person, but not with partner-based desire. This suggests that instead of the tendency to

become aroused, other dyadic aspects might be of greater relevance to explain sexual desire for one's partner. More specifically, while partner-focused desire might depend upon the partner's personal characteristics or the current relationship status, general sexual desire for an attractive person could be of a different nature. Another explanation for the lack of association between interest in sex with one's partner and sexual excitation could also be the fact that most of the items on the sexual excitation scale of the SIS/SES-SF (Carpenter et al., 2011; Moyano & Sierra, 2014) refer to the propensity for sexual excitation towards an attractive person. However, none of the items is partner-related.

Women interested in sexual activities with an attractive person or with themselves are less likely to have inhibited sexual response because of concerns about being caught and getting a STI (SI2). However, men who are more interested in sex with an attractive person are more likely to inhibit their sexual response during sexual interactions (SI1). Whereas for women, high interest in sex seems to produce a functional sexual response, a high level of desire in men may play a different role in certain aspects of arousal. This seems somewhat counterintuitive because of previous associations between this inhibitory factor and sexual difficulties such as erectile dysfunction (Bancroft & Janssen, 2000). In line with our results, Muise, Milhausen, Cole & Graham (2013) suggest that men suffering from sexual dysfunction may be more likely to seek out new sexual experiences in an effort to compensate for such problems. Still another possibility is that men are more likely to experience performance anxiety, which might be much higher when interacting with an attractive person. Furthermore, our findings show that men with a higher level of desire for an attractive person are less sexually satisfied with their partner. This complements previous research that found that individuals with lower levels of sexual satisfaction are more likely to engage in extradyadic behaviors (Allen et al., 2008). Therefore, sexual satisfaction is

differently connected to sexual desire to an attractive other in men and women, which also adds to previous studies regarding gender differences in sexual satisfaction. In particular, considering traditional sexual scripts, men are expected to be more concerned about their own desires and preferences, in contrast than women (Byers, 1996; Sánchez-Fuentes et al., 2015). In addition, men who are not satisfied tend to engage in more solitary sex (Costa, 2012; Gerressu,

Mercer, Graham, Wellings, & Johnson, 2008), however in women solitary sexuality

is related to satisfying sexual and individual functioning (Carvalheira & Leal, 2013).No gender differences were elicited for partner-based sexual desire and for solitary sexual desire. However, in contrast to women, men reported a greater interest in sex with an attractive person. Nevertheless, the effect size was small, similarly to those reported in the meta-analytic review by Petersen and Hyde (2010). Although according to past research, men have a higher sexual drive (Baumeister et al., 2001), gender differences seem to vanish when the object of desire is specified. At least, this was the case for in men and women involved in a stable heterosexual relationship. In addition, regarding solitary desire, although previous research shows that women tend to underreport masturbation activities (Alexander & Fisher, 2003), it is likely that when the risk of stigmatization is reduced (Conley, Moors, Matsick, Ziegler, & Valentine, 2011), differences may become smaller.

When interpreting the findings of this study, it is necessary to consider that all participants were recruited in Spain, and that the majority of the subjects were young, highly educated, and involved in a stable heterosexual relationship. Therefore, the extent to which the three-factor structure of the SDI might be consistent with characteristics of other samples and other cultures is still unknown. Nonetheless, this study emphasizes the need to apply appropriate statistical procedures and to re-examine the structure and psychometric properties of measures. It also highlights the distinction

between partner-focused sexual desire and sexual desire for an attractive person. Although recent conceptualizations try to separate desire from arousal, especially in the case of women, it is likely that sexual desire for an attractive person may be a more accurate indicator of sexual desire or even a possible trait of sexual desire (Goldey & van Anders, 2012; van Anders 2012). In addition by teasing apart desire for partner and desire for an attractive other, the relationships between other constructs are stronger and make more sense. Nonetheless, further research is necessary to confirm these interpretations Some considerations should be taken when considering the dimension of desire for an attractive other, as it is composed by only two items. However, based on our findings, we strongly recommend that future researchers use the SDI considering three subscales rather than two, especially if they have particular hypotheses which call for differentiate between solitary desire, partnered desire, and a generalized desire for other. Finally, from a therapeutic perspective, standard scores provide a useful and meaningful interpretation of SDI scores for Spanish men and women of different ages. Standard scores are a valuable tool since they can be used to guide interventions in a clinical framework.

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