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Sexual Beliefs and Sexual Functioning: The Mediating Role of Cognitive Distraction

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ABSTRACT

Dysfunctional sexual beliefs are vulnerability factors for sexual dysfunction. This cross-sectional study aimed to test the mediating role of cognitive distraction on the relationship between dysfunctional sexual beliefs about sexual functioning shared by men and women and sexual function. The authors used a sample of 421 cisgender heterosexual participants involved in a monogamous relationship. The hypothesized mediation model was tested using a bootstrapped cross product of coefficients approach. Results showed a significant negative, indirect effect between dysfunctional sexual beliefs and women's sexual function through cognitive distraction. The discussion of this study highlights the importance of cognitive factors in sexual functioning.

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Quantitative studies; psychological studies; sexual function; sexual beliefs; cognitive model

Sexual difficulties are quite prevalent conditions in the general population (e.g., Christensen et al., 2010; Laumann et al., 2005; Richters, Grulich, de Visser, Smith, & Rissel, 2003) and they tend to increase during a person's life due to impairments associated with disease and medication (e.g., Lammerink et al., 2017; Wagle, Carrejo, & Tan, 2012). From a psychosocial perspective that considers the interrelatedness of social and psychological factors to explain sexual problems, the literature has consistently exhibited that dysfunctional sexual beliefs (i.e., dogmatic beliefs influenced by social experience) constitute a vulnerability factor for the development of sexual dysfunction (Nobre & Pinto-Gouveia, 2006). Studies on the role of cognitive distraction have also suggested that cognitive distraction during sexual activity also has a significant negative association with sexual functioning (Nobre, 2006). Although cognitive models emphasize cognitive aspects, such as attention, they assume cognitive distraction to be a mediator between sexual beliefs and sexual functioning. However, no studies have tested the mediating role of cognitive distraction on the relationship between dysfunctional sexual beliefs and sexual functioning. As such, this study examines the mediating role of cognitive distraction on the prediction of dysfunctional sexual beliefs on both male and female sexual functioning.

Sexual beliefs

Sexual beliefs consist of ideas that people have about sexuality, which are based on life experiences and learning processes (Nobre, 2009). The pioneering work of Zilbergeld (1983, 1999) and Hawton (1985) indicate that men with erectile dysfunction share a set of ideas of sexual inadequacy (e.g., "A man wants and is always ready for sex," "Sex is equivalent to penetration"), which act as a vulnerability factor for the development and maintenance of erectile difficulties. These ideas of sexual inadequacy, in turn, make individuals more susceptible to develop cognitive distortions (e.g., "I am less than a man") while also anticipating the potential negative consequences of an eventual sexual failure. Heiman and LoPiccolo (1988) expanded on the existing work with men and reported a set of sexual myths shared by women with sexual dysfunction,

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including beliefs about female sexual conservatism (e.g., "Decent women are not aroused by erotic stimuli"), beliefs about the role of appearance and age in sexual activity (e.g., "Sex is only for people under 30 years"), as well as beliefs about performance demands (e.g., "All women can have multiple orgasms"). These data indicate that both men and women suffer from the negative influence of myths on the demands for their sexual performance.

In comparison to the number of studies that show the influence of dysfunctional sexual beliefs in the sexual functioning of men, existing research on the negative role of sexual beliefs in the development and maintenance of female sexual dysfunction is scarce. Nobre and Pinto-Gouveia (2006) investigated the differences between sexual beliefs presented by men and women with (clinical group) and without (control group) sexual dysfunctions. The authors developed and used a male and female version of the Sexual Dysfunctional Beliefs Questionnaire (Nobre, Pinto-Gouveia, & Gomes, 2003), which assesses beliefs about sexuality (function, behavior, ideals). Their results indicated that although the association of sexual beliefs with sexual functioning only reached statistical significance for the female groups (i.e., for both the clinical and control groups), both men and women in the clinical group showed higher levels of agreement with dysfunctional sexual beliefs in comparison to the sexually functional group of participants. This research highlighted that sexually dysfunctional individuals had higher scores on items related to sexual functioning (e.g., beliefs about the association between sexual functioning and age or beliefs about the importance for men to be sexually functional all the time). It also demonstrated that conservatism and performance were the most significant factors associated with negative sexual functioning in both genders. This provides further evidence corroborating what has been found in a meta-analysis (Petersen & Hyde, 2010, 2011) showing that the few differences in sexual attitudes among genders are of minimal statistical significance and that, in general, men and women share the same set and levels of attitudes toward sexuality. However, no study has used a set of sexual beliefs that men and women share (i.e., beliefs men and women have in common) to understand if there are common or distinct paths for the association of these beliefs with sexual functioning in men and women. We, therefore, decided to use a gender-invariant scale in this study to addresses sexual beliefs shared by men and women that focus specifically on sexual functioning (Pascoal, Alvarez, Pereira, & Nobre, 2017).

Cognitive distraction

Studies on the role of cognitive distraction in sexual functioning were the first type of studies addressing the role of cognitive variables in the field of sexology (Nobre, 2006). The concept of "cognitive distraction" evolved from the idea of *spectatoring*, created by Masters and Johnson (1970), to refer to the intense autofocus during sexual interactions rather than an immersion in the sensory aspects of the sexual experience. Barlow (1986) deepened the concept of spectatoring and demonstrated that when suffering from performance anxiety, people's own self-focus moved their attention from excitement, arousal, and gratification to the negative consequences of an expected sexual failure, decreasing sexual functioning (Barlow, 1986).

Studies based on self-reports on the sexual content of cognitive distraction confirm that higher levels of general cognitive distraction with performance and appearance during sexual activity are associated with lower sexual satisfaction, less consistent orgasms, higher incidence of simulated orgasms and less sexual self-esteem, confirming the negative association between cognitive distraction during sexual activity and female functioning and sexual satisfaction (Dove & Wiederman, 2000). Meana and Nunnink (2006) expanded the analysis of cognitive distraction to both genders and found higher levels of general cognitive distraction among women than among men.

Recent studies have demonstrated that a higher frequency of non-erotic thoughts during sexual activity is associated with sexual difficulties in both genders (Cuntim & Nobre, 2011; Nobre & Pinto-Gouveia, 2008a, 2008b; Purdon & Watson, 2011). Sexual beliefs about performance demands and the fear of failure promote the focus of negative attention in self-performance (Nobre, 2006) eliciting distraction from erotic and sexual feelings by maximizing the probability of distraction with nonerotic thoughts. These results seem to support the cognitive-emotional model of Nobre and Pinto-Gouveia (2006), according to whom automatic thoughts mediate the relationship between the specific sexual beliefs assigned to each gender and

the sexual functioning of both genders (Carvalho & Nobre, 2010, 2011; Nobre, 2010).

Aims of the study

As noted above, sexual beliefs and cognitive distraction have a negative relation with sexual functioning. However, despite the evidence for this, there are no empirical studies that explore the mediating role of cognitive distraction on the relationship between men and women's shared sexual beliefs and men and women's sexual functioning. Thus, the general objective of this study is to evaluate the relationship of sexual beliefs with sexual functioning of men and women and test the mediating role of cognitive distraction during sexual activity.

Considering the empirical literature above, our study proposes the following hypothesis for both genders while controlling the confounding effect of age:

Hypothesis 1: Women have higher levels of cognitive distraction than men.

Hypothesis 2: Sexual beliefs will be negatively associated with participants' sexual functioning.

Hypothesis 3: Higher cognitive distraction levels are negatively associated with participants' sexual functioning.

Hypothesis 4: Cognitive distraction plays a mediating role in the relationship between sexual beliefs and sexual functioning.

Method

Participants and procedure

A total of 124 male and 297 female Portuguese ($n = 421$), aged 18 to 68 years ($M = 27.55$, $SD = 9.35$), participated in this study. All participants self-identified as cisgendered and heterosexual and were involved in a dyadic relationship that both partners defined as monogamous. The main sociodemographic characteristics of the sample are shown in **Table 1**.

The current paper is part of a broader project that includes different data sets and different moments of data collection. The sample used in the current paper has been used to develop another study (Pascoal, Silva, & Nobre, 2016). We wanted to test (1) if beliefs whose content is not sexual, such as appearance-related beliefs, can be linked to sexual function through a specific mediator (i.e., body appearance cognitive distraction; and (2) if sexual beliefs that had never been studied before (i.e., sexual beliefs about sexual function shared by men and women) were associated with sexual function through the mediating effect of global cognitive distraction. Even though these goals are developed within the cognitive model of sexual functioning, they do not share the same conceptual framework and have different research questions. Because of the theoretical complexity of our goals and the difficulty in integrating all information in a manuscript, we decided to develop two separate manuscripts. Each manuscript answers different research questions and uses different predictors and mediators. The current manuscript includes an important covariate and uses a different method of data analysis. Our decision is in line with the recommendations regarding manuscripts using the same database of the International Committee of Medical Journal Editors (2017).

After approval by the Ethics Committee of the Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, participants were recruited through an online link, between November 2014 and May 2015, using LimeSurvey software. The release of the study and the subsequent data collection used a snowball method, using a variety of networks, including throughout the Portuguese academic community (i.e., universities), as well as from the general population. In addition, we placed the study online, requesting that scientific societies, social networks, and blogs advertise our study.

The survey protocol was preceded by the informed consent form, which explained the purpose of the study and provided some essential information for the questionnaire (e.g., absence of monetary compensation, volunteer study, the possibility to end your participation at any time, confidentiality and anonymity of data, estimated time to time indication response, and e-mail address to answer possible questions and share tips) and in which the participant indicates s/he was clarified about the conditions for participation in the study, as well as their agreement to participate. Participants were not asked for any personal details in order to guarantee the anonymity of the study.

Measures

General questionnaire

This questionnaire asked for sociodemographic information on the participants such as age, gender, relational situation/marital status, and education.

Table 1. Sociodemographic Characteristics of the Sample ($N = 421$).

Characteristic	Men ($n = 124$)		Women ($n = 297$)		Total sample ($N = 421$)	
Age						
M	30.78		26.14		27.55	
Range	18-68		18-60		18-68	
SD	11.77		7.69		9.35	
	n	%	*n*	%	*n*	%
Relational situation						
Married/living together	43	34.7	67	22.6	110	26.2
Dating	81	65.3	230	77.4	311	73.8
Education						
0–9 years	2	1.6	2	0.7	4	0.9
10–12 years	36	29	80	27	116	27.6
>13 years	86	69.4	215	72.4	301	71.5

Beliefs About Sexual Functioning Scale

The Beliefs About Sexual Functioning Scale (BASEF) consists of 15 items assessing dysfunctional beliefs about sexual functioning. It consists of five factors (anal sex beliefs, sexual pain beliefs, male performance beliefs, aging beliefs, and primacy of the relationship beliefs) aggregated in a single latent factor. Agreement with the beliefs could vary between 1 (*totally disagree*) and 5 (*totally agree*), higher values indicating higher agreement with the beliefs. The original study indicated that the BASEF is gender-invariant and therefore suitable to be used with a sample including both males and females (Pascoal et al., 2017). The authors advise its use as a single scale if the goal is to assess beliefs underlying sexual functioning, which corresponds to the goal of our study. In our study, the Cronbach's alpha for the total scale of .77 values in both genders.

Cognitive Distraction Scale (CDS)

The CDS was developed by Dove and Wiederman (2000) and consists of 20 Likert-type items that assess the focus of female attention during sexual activity. The scale consists of two dimensions: distraction based on body appearance and distraction based on sexual performance (Dove & Wiederman, 2000). Participants respond to each item using a 6-point scale, ranging from 1 (*always*) to 6 (*never*), to indicate how often they think the statement would be true of themselves in a situation of sexual involvement. We reversed the scores in this study to facilitate the interpretation of results. Thus, higher scores indicate higher cognitive distraction levels during sexual activity. In the original study, the internal consistency coefficient was .95 for both subscales, which were in turn highly intercorrelated ($r = 0.83$). In this study, we used the total scale (Cronbach's alpha = .90 for both genders).

International Index of Erectile Function

The International Index of Erectile Function (IIEF) is a questionnaire used to assess male sexual functioning, and participants respond depending on their situation within the last four weeks prior to taking the questionnaire (Rosen et al., 1997). The IIEF consists of 15 items (Likert type) divided into five dimensions of sexual function: erectile function (six items), orgasmic function (two items), sexual desire (two items), satisfaction with intercourse (three items), and overall satisfaction (two items). The IIEF determines the specific indexes for each dimension and the total index of sexual function resulting from the sum of specific indexes (minimum = 5; maximum = 75). Several studies have shown the validity and fidelity of the instrument and its sensitivity to treatment (Rosen et al., 1997). The Portuguese version (Quinta-Gomes & Nobre, 2012) showed good internal consistency for the total scale, as well as the test-retest reliability analysis supported the stability of the measurement over time. Our study utilizes the total scale (Cronbach's alpha = .85).

Female Sexual Function Index

The Female Sexual Function Index (FSFI) is a brief multidimensional scale assessing sexual functioning in women. This instrument consists of 19 Likert-type items for assessing six dimensions of female sexual functioning (sexual interest/desire, arousal, lubrication, orgasm, sexual satisfaction, and sexual pain) during the four weeks prior to their completion. As the IIEF, this instrument allows the calculation of specific indexes for each dimension, as well as a total index of sexual function (Rosen et al., 2000). The level of sexual functioning may vary between 2 and 36 points. Lower

values indicate poor sexual functioning, and higher values correspond to higher sexual functioning levels. Rosen et al. (2000) have demonstrated that the total scale has temporal stability of the results ($r = .88$) as well as good internal consistency (Cronbach alpha = .97). The Portuguese version of the FSFI revealed good internal consistency for the total scale (Cronbach alphas equal or higher than .93; Pechorro, Diniz, Almeida, & Vieira, 2009). In this study, the total scale presented a Cronbach's alpha of .90).

Data analysis

Some authors argue that mediation models can only be established with longitudinal data (Maxwell, Cole, & Mitchell, 2011). We acknowledge that causality can only be established through mediation analysis with longitudinal data that establishes change over time. However, mediation techniques can also be viewed as a type of variance partitioning, similar to other statistical control methods such as various forms of multiple regression and partial correlation. These procedures can be useful even if none of the variables involve a temporal dimension. That is, "a discovery that the relation between A and C is reduced when variance in B is controlled but that there is little change in the A–B relation when variance in C is controlled or in the B–C relation when variance in A is controlled is likely to be informative even if all variables are static and have no temporal connotation" (Salthouse, 2011, p. 797). In this sense, our data analysis plan explores possible patterns of correlation between variables and is based on an existing theory that can serve as a framework for future longitudinal research that may establish causality.

All data analysis was performed with IBM SPSS Statistics for Windows software, version 23. To verify the assumption of normality of the data, we used the Kolmogorov-Smirnov test. Student's *t*-test for independent samples was used to compare the means of men and women in the total scale of CDS. To determine the association between different variables (sexual beliefs, cognitive distraction, and sexual functioning), we used the Pearson correlation coefficient. The assumption of residuals normality required for the ordinary least squares linear regression was not met according to results of Kolmogorov-Smirnov tests (all *p*s <.05). In addition, Breusch-Pagan tests showed evidence of heteroscedasticity. To alleviate statistical problems due to a violation of the assumption of normality and homoscedasticity we applied the bootstrap method (5,000 bootstrap resamples) to the two mediation models—men ($n = 124$) and women ($n = 297$)—via PROCESS macro 2.16 for IBM-SPSS (Model 4; Hayes, 2013). Our conclusions on the indirect effect (i.e., the path from dysfunctional sexual beliefs to sexual functioning via cognitive distraction) were based on the 95% bias-corrected bootstrap confidence intervals (95% BCBCI; Preacher & Hayes, 2008). The 95% BCBCI that did not include 0 were considered significant for the indirect effect of the independent variable on dependent variable via a mediator. The effect of age was controlled in the mediation model because it is considered an important covariate of sexual functioning. The effect size was assessed with completely standardized indirect effect size (ab_{cs}) indicating that dependent variable is expected to decrease by the magnitude of effect size standard deviations for every one standard deviation increase in independent variable indirectly via the mediator. The effect size was interpreted as small (0.01), medium (0.09), and large (0.25) following the criteria of Preacher and Kelley (2011). The proportion of total effect mediated (P_m), which is defined as ab/c was also analyzed (Shrout & Bolger, 2002). In the case of correlations, the strength of relationships found were also analyzed according to the following guidelines (Cohen, 1988): $r = .10$ to .29, weak correlation; $r = .30$ to .49, moderate correlation; $r = .50$ to 1.0, strong correlation.

Results

Sexual beliefs, cognitive distraction, and sexual functioning

The means, median, standard deviations, and range of the responses to the BASEF, CDS, FSFI, and IIEF are shown in **Tables 2** and **3**. In the domain of erectile function in the male sample, 14% of participants showed values lower than the cut-off point (<22) established for diagnosing the presence of sexual problems. In the female sample, 15.2% of women showed totals scoring lower than 26.55 (i.e., were below the cutoff point). According to studies developed in Portugal using the same cut-off points, these results indicate a sample with a low prevalence of sexual problems (Quinta- Gomes & Nobre, 2014; Peixoto & Nobre, 2014).

Table 2. Means, Standard Deviations, Range, and Median of Sexual Beliefs, Cognitive Distraction, and Sexual Functioning in Men.

Measure	*M*	*SD*	Range	Median
BASEF total	31.13	8.11	16-50	31.00
CDS total	52.06	14.77	25-102	49.00
IIEF total	66.15	7.32	43-75	68.00

Note. Analysis were conducted for men ($n = 124$). BASEF = Beliefs About Sexual Functioning Scale; CDS = Cognitive Distraction Scale; IIEF = International Index of Erectile Function.

Cognitive distraction during sexual activity in men and women

To compare the values of general cognitive distraction in men and women, an independent samples *t*-test was performed. From the results, it can be verified that there are no significant differences between men ($M = 52.06$; $SD = 14.76$) and women ($M = 50.04$; $SD = 17.06$) in the total range of cognitive distraction, $t(405) = 1{,}140$, $p > .05$.

Association among variables

The result of the correlation among variables is presented in **Table 4**.

Mediation role of cognitive distraction

Among men, results indicated a negative significant total effect of beliefs on sexual functioning ($c = -.232$; 95% BCBCI: -.407, -.057) and a negative direct effect of beliefs on sexual functioning ($c' = -.190$; 95% BCBCI: -.359, -.020), once controlling for the cognitive distraction and age effects. However, a nonsignificant indirect effect upon the relationship between beliefs and on sexual functioning was found ($ab = -.042$; 95% BCBCI: -.137, .006), with a small effect size ($ab_{cs} = -.044$; 95% BCBCI: -.141, .006).

In contrast, results from the female sample revealed a negative significant total effect of beliefs on sexual functioning ($c = -.079$; 95% BCBCI: -.140, -.018), when controlling for age. A nonsignificant direct effect of beliefs on sexual functioning was found ($c' = -.049$; 95% BCBCI: -.106, .009), which demonstrates the full mediation of the effect of sexual beliefs on sexual functioning by cognitive distraction ($ab = -.031$; 95% BCBCI: -.063, -.006), indicating a small effect size for the indirect effect ($ab_{cs} = -.058$; 95% BCBCI: -.120, .010). Thus, 38.7% of the total effect of dysfunctional sexual beliefs on sexual functioning is mediated by cognitive distraction ($P_{m} = .387$).

Table 3. Means, Standard Deviations, Range, and Median of Sexual Beliefs, Cognitive Distraction, and Sexual Functioning in Women.

Measure	*M*	*SD*	Range	Median
BASEF total	28.34	6.24	15-50	29.00
CDS total	50.04	17.07	20-119	48.00
FSFI total	30.39	4.01	13-36	31.20

Note. Analysis were conducted for women ($n = 297$). BASEF = Beliefs About Sexual Functioning Scale; CDS = Cognitive Distraction Scale; FSFI = Female Sexual Function Index.

Table 4. Pearson's Correlations Between Sexual Beliefs, Cognitive Distraction, and Sexual Function in Men and Women.

Measure	BASEF total	CDS total
IIEF total	-.233*	-.333***
FSFI total	-.201**	-.391***

Note. BASEF = Beliefs About Sexual Functioning Scale; CDS = Cognitive Distraction Scale; IIEF = International Index of Erectile Function; FSFI = Female Sexual Function Index. Analysis were conducted for men ($n = 124$) and women ($n = 297$).
*$p < .05$. **$p < .01$. ***$p < .001$;

Discussion

The general objective of this study was to assess the effects of cognitive distraction and sexual beliefs on sexual functioning of men and women. More specifically, we wanted to test the mediating role of the first variable.

The first hypothesis of our study—women have higher levels of cognitive distraction than men—was not confirmed. We did not find any significant differences between men and women in their total range of cognitive distraction. This result is not in line with earlier studies' findings that women reported higher levels of cognitive distraction than men. It is possible that the findings of our study may be explained by the gender similarity hypothesis, which sustains that in recent years the differences between men and women have been reduced and, therefore, present more similarity than differences in sexual outcomes (Petersen & Hyde, 2011). On one hand, it is possible that women's performance-based cognitive distraction has risen due to the emerging expectation that women should be sexually assertive and competent (Purdon & Watson, 2011) and, on the other, it is also possible men's appearance-based cognitive distraction has likewise risen as men's overall body image concerns have also risen, making them as vulnerable as women to body image-related outcomes (Blashill, 2011; Daniel &

Bridges, 2013; Farquhar & Wasylkiw, 2007). The result of the combination of these processes may be that male and female experiences of cognitive distraction during sexual activity—based on both performance and appearance—have been converging.

The analysis of the results reveal that the second hypothesis was confirmed—sexual beliefs will be negatively associated with the sexual functioning of the participants. Sexual beliefs are negatively associated with male and female sexual functioning and emerged as a predictive variable of sexual functioning of both genders. Overall, these results are in line with previous research based on cognitive models of sexual functioning, which has shown that sexual beliefs on sexual function can be related to lower levels of sexual functioning in men and women (e.g., Nobre & Pinto-Gouveia, 2006; Nobre et al., 2003). In our study, the link between sexual beliefs and sexual functioning is weak to moderate. This can be explained by two factors: First, sexual functioning is better explained by a multifactorial perspective and, in this sense, sexual beliefs about sexual functioning are a small albeit still relevant factor; and, second, sexual beliefs about sexual function are a very specific set of beliefs amongst other more general beliefs. Thus, sexual beliefs role in explaining sexual function may be more limited when compared with more holistic beliefs about sexuality (e.g., beliefs about sex as a sinful practice). Nevertheless, for theoretical consistency and relevance, it is worth assessing whether or not this impact is mediated by cognitive distraction.

As expected in the third hypothesis, the results confirmed the fact that cognitive distraction during sexual activity is negatively associated with sexual functioning of men and women, as found in previous studies (e.g., Cuntim & Nobre, 2011; Dove & Wiederman, 2000; Nelson & Purdon, 2011) even when we controlled for the effect of age. Thus, based on theoretical models, the fact that an individual is focused in his/her sexual performance or physical appearance, in detriment of focusing on sexual stimuli and positive sensations, can cause sexual difficulties.

Finally, to verify the fourth hypothesis of this study—cognitive distraction plays a mediating role in the relationship between sexual beliefs and sexual functioning—we analyzed the effect of sexual beliefs in female and male sexual functioning. We tested the mediating role of cognitive distraction controlling for the effect of age. We found that cognitive distraction only had a mediationg effect amonge woman, as depicted in Figure 1. Thus, despite the results indicating sexual beliefs as predictors of male sexual function, this association was not mediated by cognitive distraction. We think one explanation may be that men and women experience a different set of automatic thoughts during sexual activity and the measure we used in this study was not suitable to capture the specific contents of cognitive distraction that men may experience during sexual activity. Specifically, previous research has established that during sexual activity women experience thoughts referring to sexual abuse, failure and disengagement, the partner's lack of affection, sexual passivity and control, eroticism, and self-body image, while men tend to present thoughts of failure anticipation and catastrophizing, erection concern, age and body function-related thoughts, negative conservative thoughts toward sex, and erotic thoughts (Nobre & Pinto-Gouveia, 2008c). However, we used a measure of cognitive distraction that neglects the content of automatic thoughts that may be explained by sexual beliefs about sexual functioning and that are male-specific, namely negative conservative thoughts, age and body function, and failure anticipation and catastrophizing. Another possibility is that for men a mediation model that takes into account a lack of sexual thoughts may better explain the association of dysfunctional sexual beliefs with sexual functioning. These are thoughts that are usually linked to higher levels of sexual functioning, namely arousal (Goldey & van Anders, 2011), and it may be the case that rigid dysfunctional beliefs may be related to the suppression of sexual thoughts in men rather than to cognitive distraction. Finally, another possibility is that dysfunctional beliefs about sexual functioning predict cognitive distraction during sexual activity among sexually dysfunctional men but not among highly functional men, like those included in our sample. This possibility is in line with previous research that demonstrated that the same set of beliefs can work as both a protective and as a vulnerability factor for men, depending on whether or not they have a diagnosis of sexual dysfunction (Nobre, 2010). In this sense, future studies should explore the possible mediators of the association of sexual beliefs with sexual functioning that were not contemplated in our study (e.g., conservative negative thoughts during sexual activity, lack of sexual thoughts).

Regarding the results found in the female sample, cognitive distraction presented a complete mediation

between sexual beliefs and female sexual functioning. Thus, the data demonstrate that women with such beliefs are more prone to cognitive distraction, showing a more negative sexual functioning. This gender difference in our findings may be explained by the possibility that cognitive distraction is related to relational factors in women but not in men (Pascoal, Narciso, & Pereira, 2012; Pascoal, Pereira, & Raposo, 2015).

In general, the inclusion of the mediating variable (cognitive distraction) reduced the influence of sexual beliefs on women's sexual functioning, which supports the idea that sexual beliefs only operate as a vulnerability factor for the development of sexual difficulties, and that it is necessary to take into account other explanatory factors that may be associated with sexual functioning (e.g., frequency of sexual activity, diversity of sexual practices, relationship satisfaction, body image) to predict actual dysfunction. The fact that this model of mediation explains only 37.8% of the total effect of dysfunctional sexual beliefs on a women's sexual functioning is also consistent with this idea.

Baron and Kenny (1986) have shown that a variety of phenomena in psychological and social sciences usually have multiple causes, it is not common to find perfect/full mediations. Thus, it is important to recognize that sexual beliefs and cognitive distractions are a small albeit important part of the multiple factors involved in sexual functioning. No causality can be established from the results

Previous research has tested a model on the impact of appearance beliefs on sexual function using appearance-based cognitive distraction as a mediator (Silva, Pascoal, & Nobre, 2016) and has demonstrated that beliefs that are not sexual specific play a role in sexual functioning in men and women. The current study extended knowledge in this field as, to the best of our knowledge, previous research had yet to test the mediating role of cognitive distraction on the relationship between shared sexual beliefs of both men and women and sexual functioning, so this is one of the strengths of the current study. Taken together these two studies suggest an interconnection of different sets of shared beliefs by men and women (nonsexual and sexual) to explain sexual functioning and cognitive distraction in men and women with possibly different mediation paths for each gender. The fact that our data were not collected face-to-face is another strength. Research suggests that, compared with studies that use traditional paper and pencil questionnaires, social desirability is reduced in online studies, particularly for more sensitive questions on sexuality (Pealer, Weiler, Pigg, Miller, & Dorman, 2001). However, the importance of our results notwithstanding, they should be interpreted with some caution, taking into account the limitations of the study.

A major limitation of the study is its cross-sectional nature, which does not allow us to establish causality. It is well-known that longitudinal data is mandatory to establish changes that have occurred and what processes mediate the changes that have occurred. Nevertheless, as Salthouse clearly pointed out, "we should … resist universal rejection of analytical procedures that can be informative when their limitations are recognized" (Salthouse, 2011, p. 797). Although no causality can be established, this study provides valuable information. Furthermore, there are other limitations that need to be considered. It could be that the associations found are due to other factors, for example, global inflexible patterns of interpreting and relating to the environment (Zemishlany & Weizman, 2008) or even differences between the items that constitute the outcome measures, that are different for men and women. Despite the advantages of online surveys in reducing social desirability, among other positive aspects (e.g., greater ease of access to larger samples, more accessible disclosure, and shorter time-frames), they also have their drawbacks, such as the limiting the participation to only participants who are online thus excluding or underrepresenting people without access to the internet, such as older people and people with lower socioeconomic or educational levels. Just by observing the sociodemographic characteristics of our sample, it is clear that it consists mostly of adults with high educational levels, so it is impossible to make a generalization of the results to the population at large. In addition, given that this study follows an existing line with research in the field and was designed for people who self-identify as heterosexual women or men, the results cannot be generalized to lesbian, gay, bisexual, transgender, and intersexual people. Furthermore, given that the present sample is mostly composed of highly sexually functional individuals, it is not possible to generalize the results to people with lower levels of sexual functioning or with a diagnosis of sexual dysfunction; also, we could not assess if clinical status moderates the associations found. This is a major limitation of the

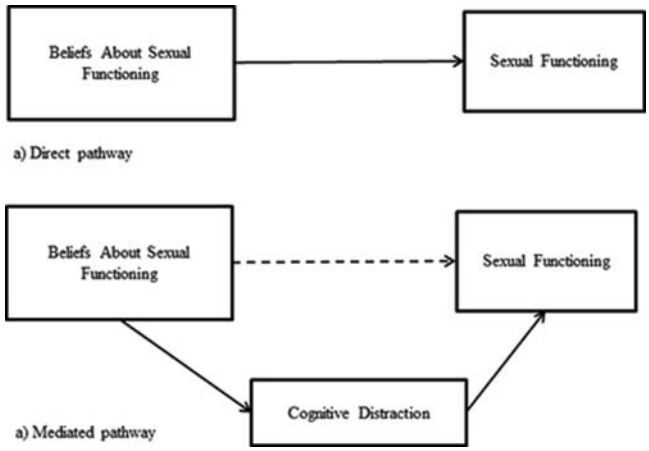

Figure 1. Mediation model for the female sample.

study. The original cognitive model aimed to understand sexual function in general, but it theoretically was developed to be especially meaningful to understand sexual dysfunction. Our study only highlights that inflexible beliefs are related to lower levels of sexual functioning in a non-clinical sample, even when controlling for age. The model still needs to prove its adequacy in clinical samples.

Despite the limitations inherent in this study, the results may have implications for clinical practice. As such, the negative relationship of beliefs and cognitive distraction with sexual functioning of the participants emphasizes the importance of cognitive factors in sexual functioning, which, in future clinical studies, can contribute to supporting the inclusion of cognitive therapeutic strategies in the treatment of sexual problems. The use of measures specifically designed to assess the cognitive aspects related to sexuality is essential to understand the psychological processes associated with sexual difficulties and to develop case conceptualizations as well as treatment plans (Nobre, 2009). The results also underscore the need to include the demystification of common-sense beliefs about sexual performance that are not based on existing scientific knowledge, whether in the content of sex education programs, in the development of continuous training, or targeting health professionals (e.g., psychologists, doctors, nurses) to emphasize the influence of cognitive factors in sexual functioning (Aker & Böke, 2016; Frühauf, Gerger, Schmidt, Munder, & Barth, 2013). In addition, taking into account the negative associations between cognitive distraction and sexual functioning of men and women, it is advisable to help people direct their attention to erotic clues and pleasurable erotic stimuli at the expense of negative thoughts relating to their sexual performance or body appearance.

Future research should also examine the association of this set of variables in populations with different characteristics from those of the current samples, namely, higher age groups and/or with lower levels of education. Furthermore, studies with a clinical sample (with sexual dysfunction) are necessary to establish the role of these beliefs as predisposing or maintenance factors of sexual disorders. Furthermore, we suggest that the analysis of the relationship between the different subscales of BASEF and specific domains of female and male sexual functioning would allow the examination of gender differences in the possible effect of different sexual beliefs (e.g., sexual pain, anal sex) on sexual functioning.

Conclusions

The evidence in the literature and the results of this study are consistent in respect to the negative relationship of sexual beliefs and cognitive distraction with sexual functioning in men and women. Although cognitive models consider cognitive distraction as a mediator between sexual beliefs and sexual functioning, there are no empirical studies to test the mediating role of cognitive distraction on the relationship between sexual beliefs and sexual functioning. Thus, one of this study's objectives was to fill this gap in research. Despite increasing the existing knowledge on the association of sexual beliefs and sexual functioning by finding a relationship between sexual beliefs and cognitive distraction during sexual activity, the

study only demonstrated the existence of mediation in the female group. Although this result supports the emotional cognitive model of sexual functioning, the lack of mediation in men raises questions that future research should clarify, especially whether these results can also be found in populations with sexual dysfunction. The findings are important for a better understanding of sexual functioning in marital/conjugal contexts and to reaffirm the role of cognitive models while also contributing to their clarification and understanding of their complexity.

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References

Aker, S., & Böke, Ö. (2016). The effect of education on the sexual beliefs of family physicians. *International Journal of Sexual Health*, *28*(1), 111–116. doi:10.1080/19317611.2015.1137669

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology*, *54*, 140–148. doi:10.1037/0022-006X.54.2.140

Baron, R., & Kenny, D. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. doi:10.1037/0022-3514.51.6.1173

Blashill, A. J. (2011). Gender roles, eating pathology, and body dissatisfaction in men: A meta-analysis. *Body Image*, *8*(1), 1–11. doi:10.1016/j.bodyim.2010.09.002

Carvalho, J., & Nobre, P. (2010). Predictors of women's sexual desire: The role of psychopathology, cognitive-emotional determinants, relationship dimensions, and medical factors. *Journal of Sexual Medicine*, *7*, 928–937. doi:10.1111/j.1743-6109.2009.01568.x

Carvalho, J., & Nobre, P. (2011). Biopsychosocial determinants of men's sexual desire: Testing an integrative model. *Journal of Sexual Medicine*, *8*, 754–763. doi:10.1111/j.1743-6109.2010.02156.x

Christensen, B. S., Grønbaek, M., Osler, M., Pedersen, B. V., Graugaard, C., & Frisch, M. (2010). Sexual dysfunctions and difficulties in Denmark: Prevalence and associated sociodemographic factors. *Archives of Sexual Behavior*, *40*, 121–132. doi:10.1007/s10508-010-9599-y

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cuntim, M., & Nobre, P. (2011). The role of cognitive distraction on female orgasm. *Sexologies*, *20*, 212–214. doi:10.1016/j.sexol.2011.08.001

Daniel, S., & Bridges, S. (2013). The relationships among body image, masculinity, and sexual satisfaction in men. *Psychology of Men & Masculinity*, *14*(4), 345–351. doi:10.1037/a0029154

Dove, N. L., & Wiederman, M. W. (2000). Cognitive distraction and women's sexual functioning. *Journal of Sex and Marital Therapy*, *26*, 67–78. doi:10.1080/009262300278650

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression based approach*. New York, NY: Guilford Press.

Hawton, K. (1985). *Sex therapy: A practical guide*. Northvale, NJ: Jason Aronson Inc.

Heiman, J. R., & LoPiccolo, J. (1988*). Becoming orgasmic: A sexual and personal growth program for women* (rev. ed.). New York, NY: Prentice-Hall.

Farquhar, J. C., & Wasylkiw, L. (2007). Media images of men: Trends and consequences of body conceptualization. *Psychology of Men & Masculinity*, *8*(3), 145–160. doi:10.1037/1524-9220.8.3.145

Frühauf, S., Gerger, H., Schmidt, H., Munder, T., & Barth, J. (2013). Efficacy of psychological interventions for sexual dysfunction: A systematic review and meta-analysis. *Archives of Sexual Behavior*, *42*, 915–933. doi:10.1007/s10508-012-0062-0

Goldey, K. L., & van Anders, S. M. (2011). Sexy thoughts: Effects of sexual cognitions on testosterone, cortisol, and arousal in women. *Hormones and Behavior*, *59*, 754–764. doi:10.1016/j.yhbeh.2010.12.005

International Committee of Medical Journal Editors. (2017). *Manuscripts based on the same database*. Retrieved from http://www.icmje.org/recommendations/browse/publishing-and-editorial-issues/overlapping-publications.html

Lammerink, E. A., de Bock, G. H., Pascal, A., van Beek, A. P., van den Bergh, A. C., Sattler, M. G., & Mourits, M. J. (2017). A survey of female sexual functioning in the general Dutch population. *The Journal of Sexual Medicine*, *14*(7), 937–949. doi:10.1016/j.jsxm.2017.04.676

Laumann, E. O., Nicolosi, A., Glasser, D. B., Paik, A., Gingell, C., Moreira, E., & Wang, I. (2005). Sexual problems among women and men aged 40–80 years: Prevalence and correlates identified in the Global Study of Sexual Attitudes and Behaviors. *International Journal of Impotence Research*, *17*, 39–57. doi:10.1038/sj.ijir.3901250

Masters, W., & Johnson, V. (1970). *Human sexual inadequacy*. Boston, MA: Little, Brown.

Maxwell, S. E., Cole, D. A., & Mitchell, M. A. (2011). Bias in cross-sectional analyses of longitudinal mediation: Partial and complete mediation under an autoregressive model. *Multivariate Behavioral Research*, *46*(5), 816–841. doi:10.1080/00273171.2011.606716

Meana, M., & Nunnink, S. (2006). Gender differences in the content of cognitive distraction during sex. *The Journal of Sex Research*, *43*(1), 59–67. doi:10.1080/00224490609552299

Nelson, A., & Purdon, C. (2011). Non-erotic thoughts, attentional focus, and sexual problems in a community sample. *Archives of Sexual Behavior*, *40*, 395–406. doi:10.1007/s10508-010-9693-1

Nobre, P. (2006). *Disfunções Sexuais*. Lisbon, Portugal: Climepsi Editores.

Nobre, P. (2009). Determinants of sexual desire problems in women: Testing a Cognitive-Emotional Model. *Journal of Sex and Marital Therapy*, *35*, 360–377. doi:10.1080/00926230903065716

Nobre, P. (2010). Psychological determinants of erectile dysfunction: Testing a cognitive-emotional model. *Journal of Sexual Medicine*, *7*, 1429–1437. doi:10.1111/j.1743-6109.2009.01656.x

Nobre, P., Pinto-Gouveia, J., & Gomes, F. A. (2003). Sexual dysfunctional beliefs questionnaire: An instrument to assess sexual dysfunctional beliefs as vulnerability factors to sexual problems. *Sexual and Relationship Therapy*, *18*, 101–135. doi:10.1080/1468199031000061281

Nobre, P., & Pinto-Gouveia, J. (2006). Dysfunctional sexual beliefs as vulnerability factors for sexual dysfunction. *Journal of Sex Research*, *43*(1), 68–75. doi:10.1080/00224490609552300

Nobre, P., & Pinto-Gouveia, J. (2008a). Cognitions, emotions and sexual response: Analysis of the interaction between automatic thoughts and emotional responses during sexual activity and its impact on sexual arousal. *Archives of Sexual Behavior*, *37*, 652–661. doi:10.1007/s10508-007-9258-0

Nobre, P., & Pinto-Gouveia, J. (2008b). Cognitive and emotional predictors of female sexual dysfunctions: Preliminary findings. *Journal of Sexual Medicine*, *34*(4), 325–342. doi:10.1080/00926230802096358

Nobre, P. J., & Pinto-Gouveia, J. (2008c). Differences in automatic thoughts presented during sexual activity between sexually functional and dysfunctional men and women. *Cognitive Therapy and Research*, *32*(1), 37–49. doi:10.1007/s10608-007-9165-7

Nobre, P. (2010). Psychological determinants of erectile dysfunction: Testing a cognitive-emotional model. *Journal of Sexual Medicine*, *7*(4, Pt 1), 1429–1437. doi:10.1111/j.1743-6109.2009.01656.x

Pascoal, P. M., Alvarez, M.-J., Pereira, C. R., & Nobre, P. (2017). Development and initial validation of the Beliefs About Sexual Functioning Scale: A gender invariant measure. *The Journal of Sexual Medicine*, *14*, 613–623. doi:10.1016/j.jsxm.2017.01.021

Silva, E., Pascoal, P. M., & Nobre, P. (2016). Beliefs about appearance, cognitive distraction and sexual functioning in men and women: A mediation model based on cognitive theory. *The Journal of Sexual Medicine*, *13*(9), 1387–1394. doi:10.1016/j.jsxm.2016.06.005

Pascoal, P. M., Narciso, I., & Pereira, N. M. (2012). Predictors of body appearance cognitive distraction during sexual activity in men and women. *Journal of Sexual Medicine*, *9*(11), 2849–2860. doi:10.1111/j.1743-6109.2012.02893.x

Pascoal, P. M., Pereira, L. B., & Raposo, C. F. (2015). Predictors of body appearance cognitive distraction during sexual activity in a sample of men with erectile disorder. *International Journal of Impotence Research*, *27*, 103–107. doi:10.1038/ijir.2014.40

Pealer, L. N., Weiler, R. M., Pigg, R. M., Miller, D., & Dorman, S. M. (2001). The feasibility of a web-based surveillance system to collect health risk behavior data from college students. *Health Education & Behavior*, *28*, 547–559. doi:10.1177/109019810102800503

Pechorro, P., Diniz, A., Almeida, S., & Vieira, R. (2009). Validação portuguesa do Índicede Funcionamento Sexual Feminino (FSFI). *Laboratório de Psicologia*, *7*(1), 33–44. doi:10.14417/lp.684

Peixoto, M., & Nobre, P. (2014). Prevalence of sexual problems and associated distress among lesbian and heterosexual women. *Journal of Sex & Marital Therapy*, *41*(4), 427–439. doi:10.1080/0092623X.2014.918066

Petersen, J. L., & Hyde, J. S. (2010). A meta-analytic review of research on gender differences in sexuality, 1993-2007. *Psychological Bulletin*, *136*(1), 21–38. doi:10.1037/a0017504

Petersen, J. L., & Hyde, J. S. (2011). Gender differences in sexual attitudes and behaviors: A review of meta-analytic results and large datasets. *Journal of Sex Research*, *48*, 149–165. doi:10.1080/00224499.2011.551851

Preacher, K., & Hayes, A. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*, 879–891. doi:10.3758/BRM.40.3.879

Preacher, K., & Kelley, K. (2011). Effect size measures for mediation models: Quantitative strategies for communicating indirect effects. *Psychological Methods*, *16*(2), 93–115. doi:10.1037/a0022658

Purdon, C., & Watson, C. (2011). Non-erotic thoughts and sexual functioning. *Archives of Sexual Behavior*, *40*, 891–902. doi:10.1007/s10508-011-9755-z

Quinta-Gomes, A. L., & Nobre, P. (2012). The International Index of Erectile Function (IIEF-15): Psychometric properties of the Portuguese version. *The Journal of Sexual Medicine*, *9*(1), 180–187. doi:10.1111/j.1743-6109.2011.02467.x

Quinta-Gomes, A. L., & Nobre, P. (2014). Prevalence of sexual problems in Portugal: Results of a population-based study using a stratified sample of men aged 18 to 70 years. *The Journal of Sex Research*, *51*(1), 13–21. doi:10.1080/00224499.2012.744953

Richters, J., Grulich, A. E., de Visser, R. O., Smith, A. M. A., & Rissel, C. E. (2003). Sex in Australia: Sexual difficulties in a representative sample of adults. *Australian and New Zealand Journal of Public Health*, *27*, 164–170. doi:10.1111/j.1467-842X.2003.tb00804.x

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

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

Salthouse, T. A. (2011). All data collection and analysis methods have limitations: Reply to Rabbitt (2011) and Raz and Lindenberger (2011). *Psychological Bulletin*, *137*(5), 196–199. doi:10.1037/a0024843

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and non-experimental studies: New procedures and recommendations. *Psychological Methods*, *7*(4), 422–445. doi:10.1037/1082-989X.7.4.422

Wagle, K. C., Carrejo, M. H., & Tan, R. S. (2012). The implications of increasing age on erectile dysfunction. *American Journal of Men's Health*, *6*, 273–279. doi:10.1177/1557988311431629

Zemishlany, Z., & Weizman, A. (2008). The Impact of Mental Illness on Sexual Dysfunction. In R. Balon (Ed.), *Sexual dysfunction: The brain-body connection*. (pp. 89–106). Basel: Karger.

Zilbergeld, B. (1983). *Men and sex*. London, UK: Fontana.

Zilbergeld, B. (1999). *The new male sexuality* (rev. ed.). New York, NY: Batam Books.