

Cognitive Schemas Activated in Sexual Context: A Comparative Study with Homosexual and Heterosexual Men and Women, With and Without Sexual Problems

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Abstract The role of cognitive schemas on sexual functioning has been studied in samples of heterosexual men and women. However, there are no published studies on the impact of cognitive schemas on sexual functioning in gay men or lesbian women. The current study analyzed the differences in cognitive schemas associated with negative sexual events in a sample of heterosexual and homosexual men and women, with and without sexual problems. A total of 168 women and 148 men completed a web-survey. Participants answered questions about self-perceived sexual problems, and completed the Questionnaire of Cognitive Schemas Activated in Sexual Context. Results for men and women were analyzed in separate MANOVAs (sexual problems \times sexual orientation). Men with sexual problems scored significantly higher in negative cognitive schemas when facing an adverse sexual episode compared with sexually healthy men, regardless of sexual orientation. Women with sexual problems also scored significantly higher in Undesirability/rejection, Incompetence, and Difference/Loneliness schemas when compared women without sexual problems, regardless of sexual orientation. Also, sexual orientation was also found to have a significant effect among women, with lesbian women activating significantly more Undesirability/rejection, Difference/Loneliness, and Helpless schemas, than heterosexual women. Overall, findings suggest that, despite some specific patterns particularly in lesbian women, the role of cognitive schemas on sexual functioning is very similar in heterosexual and homosexual men and women. These results

highlight the core role of cognitive factors on sexual problems in gay men and lesbian women.

Keywords Cognitive schemas · Negative sexual episodes · Sexual problems · Sexual orientation

Introduction

Cognitive schemas, or core beliefs, represent central conceptualizations about the self that guide human behavior, and assign meaning to past experiences (Beck 1995). Dysfunctional cognitive schemas may act as vulnerability or predisposing factors for the development of different psychopathological manifestations (e.g., depression, anxiety disorders, sexual dysfunction) (Beck 1995, 1996). Barlow's cognitive-affective model (Barlow 1986; Sbrocco and Barlow 1996; Wiegel et al. 2007) was one of the first attempts to explain the role of the cognitive dimension as a vulnerability factor for sexual dysfunction. Sbrocco and Barlow (1996) postulated that individuals with sexual dysfunction tend to present unrealistic and inflexible sexual beliefs (e.g., "A real man should have an erection whenever and wherever"). Whenever these demanding and unrealistic standards are not met, catastrophic personal implications may arise ("A man who cannot attain an erection is not a real man"), facilitating the development of negative self-views (negative self-schemas): "I'm not a real man". Thus, unrealistic schemas regarding sexuality and outcome expectations, as well as personal negative implications resulting from its non-accomplishment, work as vulnerability factors in the development of sexual dysfunction.

Following Barlow's work there has been an increased interest in the role of sexual schemas on sexual behavior and

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sexual functioning. Andersen et al. (1994, 1999) proposed the concept of sexual self-schemas, cognitive generalizations about sexual issues based on previous experiences that influence current and future sexual behavior. Empirical research has supported the role of sexual self-schemas on women's and men's sexual behavior Anderson and Cyranowski 1994; Anderson et al. 1999; Cyranowski and Anderson 1998; Cyranowski et al. 1999; Hill 2007; Reissing et al. 2005). Women with negative sexual self-schemas were described as unromantic and as being more inhibited in their sexual interactions (Anderson and Cyranowski 1994). Findings also suggested that women with negative sexual self-schemas may be more likely to develop sexual problems (Anderson and Cyranowski 1994; Cyranowski et al. 1999). Recently, negative sexual self-schemas have been associated with sexual distress and sexual pain (Pazmani et al. 2013), and lower levels of positive sexual self-schemas were reported by women with vaginismus (Reissing et al. 2003). Moreover, after gynecological cancer, positive sexual self-schemas may act as protective factors from psychological distress, promoting sexual satisfaction and a healthier sexual life (Anderson et al. 1994; Carpenter et al. 2009).

Studies conducted in laboratorial settings have also suggested the role of cognitive schemas on sexual response, with positive self-schemas being associated to higher levels of positive affect and female sexual arousal (Kuffel and Heiman 2006; Middleton et al. 2008), and negative self-schemas predicting negative affect before the visualization of sexual stimulus (Rellini and Meston 2011).

Recently, Nobre and colleagues developed a new measure, the *Questionnaire of Cognitive Schemas Activated in Sexual Context* (QCSASC), to assess cognitive schemas activated in response to negative sexual events (Nobre and Pinto-Gouveia 2009a), related to the most common sexual difficulties. Individuals who may have experienced these unsuccessful sexual episodes are invited to rate the frequency in which they usually happen, as well as the associated emotions, and respond to a list of 28 negative sexual schemas based on J. Beck theory (1995). The cognitive schemas cover five main domains: Undesirability/rejection schemas (e.g. "I am defective - others don't love me"); Incompetence schemas (e.g. "I am incompetent"); Difference/Loneliness schemas (e.g. "I am lonely"); Self-depreciation schemas (e.g. "I am unworthy"); and Helpless schemas (e.g. "I am needy"). Studies conducted in samples of men and women, with and without sexual dysfunction, indicated that sexually dysfunctional men and women activated significantly more negative schemas (in particular, Incompetence, Difference/loneliness, Self-depreciation and Helpless) in response to negative sexual episodes (Oliveira and Nobre 2013; Nobre and Pinto-Gouveia 2009b; Quinta-Gomes and Nobre 2012a).

Studies conducted in samples of men and women with specific sexual dysfunctions have also supported the role of

cognitive schemas. More specifically, women with orgasmic disorder reported significantly more Incompetence and Difference/Loneliness cognitive schemas, women with hypoactive sexual desire disorder reported more frequent Incompetence, Helpless, and Difference/Loneliness schemas, while women with vaginismus reported more Incompetence, Undesirability/rejection, Self-depreciation, and Difference/Loneliness schemas when compared with sexually healthy controls (Nobre and Pinto-Gouveia 2008).

Moreover, studies using structural equation models have shown a significant association of Incompetence schemas on erectile function in men (Nobre 2010) and vaginismus in women (Nobre and Pinto-Gouveia 2008). One consistent finding in the previous studies is the main role of the Incompetence schema, the dimension that best distinguished between sexually functional and dysfunctional men and women (Nobre 2010; Nobre and Pinto-Gouveia 2008, 2009b; Oliveira and Nobre 2013; Quinta-Gomes and Nobre 2012a).

Regardless of this accumulated knowledge about the role of cognitive schemas on sexual dysfunction, no research has ever been published using samples of gay men and lesbian women. However, studies have shown that sexual dysfunction is highly prevalent among gay men and lesbian women. Recent findings indicated that 42.5 % of gay men (Lau et al. 2008) and 75.6 % of lesbian women (Lau et al. 2006) reported at least one sexual problem during their lifetime. These prevalence rates are similar to those found in heterosexual men (41.6 %; Mitchell et al. 2013), but higher than those usually reported in studies conducted with heterosexual women (51.2 %; Mitchell et al. 2013). Furthermore, studies on the content of cognitive schemas have shown that gay men and lesbian women with depression, chronic stress and anxiety-related disorders are more likely to report negative self-schemas, compared with gay men and lesbian women without mental health problems (e.g. Safren et al. 2001; Safren and Rogers 2001; Walsh and Hope 2010). Finally, negative self-schemas have been associated with sexual dysfunction in heterosexual samples of men and women. Therefore, we can hypothesize that cognitive schemas are also related to sexual functioning in gay men and lesbian women. However, and despite the high prevalence rates of sexual problems among non-heterosexual men and women, there are still no studies addressing this topic in gay men and lesbian women. The knowledge of the role of cognitive schemas on sexual functioning in non-heterosexual populations is of the utmost importance for a better understanding of the cognitive processes involved in the vulnerability and maintenance of sexual problems and may inform the development of cognitive therapies for sexual dysfunction in gay men and lesbian women.

The current study aimed at analyzing the differences between men and women with different sexual orientation

(heterosexual men and women, gay men, and lesbian women), with and without distress and self-perceived sexual problems. We expected to find greater activation of negative cognitive schemas in response to negative sexual events in men and women with distress and self-perceived sexual problems, regardless of sexual orientation. We also hypothesized that the activation of Incompetence schemas would best differentiate between participants with and without sexual problems.

Additionally, we aimed to test the ability of cognitive schemas activated in response to negative sexual events to predict sexual functioning (as a dimensional construct) in men and women with different sexual orientation. We expected that cognitive schemas activated in sexual context would be significant predictors of both male and female sexual functioning, after controlling for the effects of sexual orientation.

Methods

Participants and Procedures

A total of 188 men and 252 women completed an online survey about sexual problems and cognitive variables, between May 2012 and May 2013. The survey was announced on Portuguese LGBT forums, websites, and social networks. Additionally, an invitation by email was sent using university and LGBT association mailing lists. A full explanation about the study was given along with the link to the survey (www.limesurvey.org, LimeSurvey™, Fa. Carsten Schmitz/Germany). Initially, participants were requested to select a link to best identify their sexual orientation (gay men; heterosexual men; lesbian women; heterosexual women). After that, participants read an informed consent, and after agreeing, volunteers were invited to answer the survey. In order to safeguard privacy and anonymity, data were collected and archived in an Aveiro University server, and no IP address was recorded. Completion of the online survey took, on average, 20 min and no monetary compensation or other incentives were given. The study was approved by an Ethics Committee.

Measures

Socio-Demographic Questionnaire

Socio-demographic characteristics were evaluated by several questions about personal information (age, education, marital status). Regarding sexual orientation, participants answered the following question “How would you define your sexual orientation?”, according to a *Likert* scale (from 1—*Exclusively homosexual* to 7—*Exclusively heterosexual*). Also, participants answered the following question “Over the past 6 months, how often have you engaged in sexual activity with a man?” (lesbian

women and heterosexual men version) or “Over the past 6 months, how often have you engaged in sexual activity with a woman?” (gay men and heterosexual women version).

Self-Perceived Sexual Problems in Men

Self-perceived distress plays a major role in sexual dysfunction clinical diagnosis (APA 2013), suggesting that only a subgroup of men and women experience moderate to extreme distress associated with their sexual difficulties, regardless of sexual orientation (Lau et al. 2006; Mitchell et al. 2013; Peixoto and Nobre 2015). Feeling distress about sexual difficulties could be more relevant than the sexual difficulties per se (Stephenson and Meston 2012). Therefore, in order to assess perceived sexual problems (erectile difficulties, premature ejaculation, delayed ejaculation, and lack of sexual desire) a specific questionnaire was developed. To evaluate erectile difficulties, participants answered the question: “Over the last six months, have you experienced marked decrease in erectile rigidity, or inability to obtain/maintain an erection until the completion of the sexual activity?”. Premature ejaculation was assessed by the following question “Over the last six months, how rapidly have you usually ejaculated after beginning sexual activity?”. For delayed ejaculation, participants answered the question: “Over the last six months, have you experienced delay in or absence of ejaculation?”. Lack of sexual desire was assessed by the following question: “Over the past six months, have you experienced absent or markedly reduced interest in sexual activity?”. Participants answered according to a 7 point *Likert* scale (1—*No/Never happened*; 7—*Yes, in all sexual encounters/Always*). For premature ejaculation, answer options were specifically related to time until ejaculation (1—*60 seconds or more*; 7—*Prior to start of sexual activity*). Regarding distress levels, participants answered the question: “How would you classify the rate (degree) of associated distress?” Answers were given in a 7 point *Likert* scale (1—*No distress*; 7—*Extreme distress*).

Self-Perceived Sexual Problems in Women

Likewise, a specific questionnaire was developed in order to assess perceived sexual problems, namely orgasmic difficulties, lack of sexual desire, arousal difficulties, and sexual pain. In order to evaluate orgasmic difficulties, participants answered the question: “Over the past six months, have you experienced an absence of orgasm?”. Lack of sexual desire was assessed by the following question: “Over the past six months, have you experienced absent or markedly reduced interest in sexual activity?”. For arousal difficulties participants answered the question: “Over the past six months, have you experienced absent or reduced sexual excitement

or pleasure during sexual activity?”. Participants answered according to a 7 point *Likert* scale (1—*Never*; 7—*Always*). Finally, for sexual pain, participants answered the following question: “How much pain do you feel during (attempted) penetration?”, according to a 7 point *Likert* scale (1—No pain; 7—Extreme pain). Additionally, an option for “0—*No sexual activity*” was also included. In order to assess distress levels, participants answered the question: “How would you classify the rate (degree) of associated distress?” using a 7 point *Likert* scale (1—*No distress*; 7—*Extreme distress*).

The International Index of Erectile Function (IIEF)

The International Index of Erectile Function (IIEF) (Rosen et al. 1997) is a 15-item self-administered measure assessing different areas of sexual functioning in men. A principal component analysis identified five factors: erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction. The IIEF allows the calculation of a sexual function total index, as well as specific indexes for each dimension. Higher values correspond to better levels of sexual functioning. Psychometric studies supported the validity (significant mean score differences between a clinical and a control group) and reliability (Cronbach’s alpha values of .73 and higher and test–retest from $r = .64$ to $r = .84$) of the measure. Studies with clinical samples demonstrated its sensitivity and specificity for detecting treatment related changes (Rosen et al. 1997). The Portuguese version also presented good psychometric properties, with test–retest analysis indicated correlations between two administrations with a 2 weeks interval ranging from .69 and .90, and Cronbach’s alpha values between .72 and .86 (Quinta-Gomes and Nobre 2012b). A modified version of the IIEF, for men who have sex with men was used with gay men (IIEF-MSM; Coyne et al. 2010). The psychometric study suggested good reliability with Cronbach’s alpha values of ranging from .82, .83, and .89 for erectile, orgasmic function and sexual desire function domains (Coyne et al. 2010).

The Female Sexual Function Index (FSFI)

The FSFI (Rosen et al. 2000) is a 19-item measure, easily administered and scored, providing detailed information on the major dimensions of sexual function. A principal component analysis identified six factors: sexual interest/desire, sexual arousal, lubrication, orgasm, sexual satisfaction and sexual pain. The measure presents acceptable test–retest reliability ($r = .79$ to $r = .86$), internal consistency (Cronbach’s alpha values of .82 and higher), and validity (demonstrated by significant mean difference scores between a clinical and a control group) (Rosen et al. 2000). The measure allows the calculation of specific

indexes for each dimension as well a sexual function index, with higher scores indicating greater levels of sexual functioning. The Portuguese version also presented good psychometric properties with Cronbach’s alpha values ranging between .88 and .93 (Pechorro et al. 2009).

Questionnaire of Cognitive Schemas Activated in Sexual Context (QCSASC)

The QCSASC (Nobre and Pinto-Gouveia 2009a) is a 28-item measure that allows the assessment of cognitive schemas in response to specific sexual episodes. Firstly, four sexual episodes related to common sexual dysfunctions are presented: hypoactive sexual desire disorder, erectile disorder, premature ejaculation and retarded ejaculation in the male version; and hypoactive sexual desire disorder, orgasmic disorder, sexual pain, and subjective arousal difficulties in the female version. Participants rated the frequency of each sexual episode (1—Never happened; 5—Happens often). Secondly, participants indicated the emotions aroused by the episode (checking all that apply from a list of ten emotions: worry, sadness, disillusion, fear, guilt, shame, anger, hurt, pleasure, and satisfaction). Finally, participants were instructed to focus on the most frequent situation and associated emotions, and answer to 28 self-statements reproducing the self-schemas presented by Beck (1995), using a 5-point *Likert* scale (1—Completely false; 5—Completely true). A factor analysis of the 28 schemas suggested a five factor structure (Nobre and Pinto-Gouveia 2009a): Undesirability/rejection, Incompetence, Self-depreciation, Difference/loneliness, and Helpless. Scales were computed as sums, with higher scores representing more cognitive schemas. Psychometric studies suggested adequate test–retest reliability, with 4-week interval ($r = .66$) and excellent internal consistency with Cronbach’s alpha of .94 (Nobre and Pinto-Gouveia 2009a). For the gay male version, sexual episodes were rewritten in order to describe realistic sexual episodes between two men; and an episode was added to describing receptive anal sex pain. For the lesbian women version, minimal changes were added to sexual episodes. Cronbach alpha’s values for current study were .96 for the heterosexual men sample; .95 for the gay men sample; .95 for the heterosexual women sample; and .96 for the lesbian women sample.

Characterization of the Sample

From the 104 participants who completed the survey for gay men, 24 were excluded for scoring 4 or above on the seven point *Likert* scale of sexual orientation, and 6 were also excluded for reporting sexual activity with a woman in the previous 6 months. Likewise, from the 84 participants who completed the heterosexual men survey, four were excluded

for scoring 4 or less on the sexual orientation scale, and six were excluded for indicating sexual activity with another man in the previous 6 months. From the 134 participants self-identified as lesbian women, 31 were excluded for scoring 4 or above on the seven point Likert scale of sexual orientation, and 19 were also excluded for reporting sexual activity with a man in the previous 6 months. Likewise, from the 118 women self-identified as heterosexual, 17 were excluded for scoring 4 or less on the sexual orientation scale, and 17 were also excluded for indicating sexual activity with another woman in the previous 6 months.

A total of 74 male participants (37 gay men and 37 heterosexuals) reported distress and self-perceived sexual problems, indicating at least one sexual problem (erectile difficulties, premature ejaculation, delayed ejaculation, and lack of sexual desire), over the past 6 months, in 50 % of the times or more,¹ and with associated distress levels ranging from moderate to severe (4–7 on a 7 point *Likert* scale). The main sexual problems in the gay men group with distress and self-perceived sexual problems were: sexual desire problems (35.1 %), delayed ejaculation (27 %), erectile difficulties (21.6 %), and premature ejaculation (16.2 %). Almost a third (27 %) of the group reported additional sexual problems. The main sexual problems in the heterosexual male group with distress and self-perceived sexual problems were: delayed ejaculation (29.7 %), premature ejaculation (27 %), erectile difficulties (21.6 %), and sexual desire problems (21.6 %). Almost a fourth (24.3 %) of the group reported other comorbid sexual problems. No significant differences were found between gay and heterosexual men with distress and self-perceived sexual problems regarding the percentage of erectile difficulties, $\chi^2(1) = 0.00$, $p > .999$, premature ejaculation, $\chi^2(1) = 0.294$, $p = .588$, delayed ejaculation, $\chi^2(1) = 0.00$, $p > .999$, and lack of sexual desire, $\chi^2(1) = 1.418$, $p = .234$. A total of 74 men (37 gay men and 37 heterosexuals) were selected from the database in order to match the sociodemographic characteristics (age, marital status, and educational level) of the groups with distress and self-perceived sexual problems. No significant differences were found in the four groups regarding age, $F(3, 147) = 0.272$, $p = .846$; and educational level, $\chi^2(3) = 0.736$, $p = .865$. However, differences were found between groups on marital status, $\chi^2(3) = 13.805$, $p = .003$, with heterosexual men reporting higher rates of married/living together. Additionally, gay men with sexual problems scored significantly lower on the International Index of Erectile Function-Version for Men Who Have Sex with Men (IIEF-MSM; Coyne et al. 2010), compared with gay men without sexual problems, $t(45) = 4.467$, $p < .001$. Likewise, heterosexual men with sexual problems scored significantly lower on the

International Index of Erectile Function (IIEF; Rosen et al. 1997), compared with heterosexual men without sexual problems, $t(60) = 3.369$, $p = .001$. Table 1 presents the socio-demographic characteristics of the sample.

Among females, a total of 79 female participants (38 lesbian and 41 heterosexual) reported distress and self-perceived sexual problems indicating at least one sexual problem (lack of sexual desire, sexual arousal difficulties, orgasmic difficulties, and sexual pain), over the past 6 months, in 50 % of the times or more, and with distress levels ranging from moderate to severe (4–7 on a 7 point *Likert* scale). The main sexual problems in the lesbian group with distress and self-perceived sexual problems were: sexual pain (50 %), orgasmic difficulties (18.4 %), sexual desire problems (18.4 %), and sexual arousal difficulties (13.2 %). More than a third (39.5 %) of the group reported other comorbid sexual problems. Regarding the heterosexual group with distress and self-perceived sexual problems, the main sexual problems were: sexual pain (43.9 %), orgasmic difficulties (24.4 %), sexual desire problems (17.1 %), and sexual arousal difficulties (14.6 %). Almost a third (31.7 %) of the group reported additional sexual problems. No significant differences were found between lesbian and heterosexual women with distress and self-perceived sexual problems regarding the percentage of orgasmic difficulties, $\chi^2(1) = 0.223$, $p = .637$, lack of sexual desire, $\chi^2(1) = 0.231$, $p = .631$, sexual arousal difficulties, $\chi^2(1) = 0.216$, $p = .641$, and sexual pain, $\chi^2(1) = 0.294$, $p = .587$. A total of 38 lesbian and 41 heterosexual women were selected from the database in order to match the sociodemographic characteristics (age, marital status, educational level) of the groups with distress and self-perceived sexual problems. No significant differences were found in the four groups regarding age, $F(3, 157) = 0.135$, $p = .939$; marital status, $\chi^2(3) = 2.078$, $p = .556$, and educational level, $\chi^2(3) = 0.811$, $p = .847$. Additionally, lesbian women with sexual problems scored significantly lower on the Female Sexual Functioning Index (FSFI; Rosen et al. 2000), compared with lesbian women without sexual problems, $t(58) = 7.676$, $p < .001$. Likewise, heterosexual women with sexual problems scored significantly lower on the FSFI, compared with heterosexual women without sexual problems, $t(65) = 5.634$, $p < .001$. Table 1 shows the sociodemographic characteristics of the sample.

Results

Cognitive Schemas in Sexual Context, Sexual Orientation, and Sexual Problems in Men

In order to assess the effects of sexual problems and sexual orientation, and their interaction on the activation of cognitive schemas in sexual context, a 2 (with vs. without sexual problems) \times 2 (gay vs. heterosexual men) MANCOVA was

¹ For Premature Ejaculation, cutoff was ≥ 2 in 7 point Likert scale (“Less than 60 seconds”).

Table 1 Socio-demographic characteristics of the male sample (N = 148) and of the female sample (N = 158)

	Gay men (n = 74)		Heterosexual men (n = 74)		Lesbian women (n = 76)		Heterosexual women (n = 82)	
	Clinical group (n = 37) M (SD)	Control group (n = 37) M (SD)	Clinical group (n = 37) M (SD)	Control group (n = 37) M (SD)	Clinical group (n = 38) M (SD)	Control group (n = 38) M (SD)	Clinical group (n = 41) M (SD)	Control group (n = 41) M (SD)
Age	30.84 (11.15)	29.46 (10.94)	31.76 (10.22)	30.35 (12.32)	26.29 (8.80)	26.76 (6.61)	25.98 (8.79)	25.66 (7.70)
	%	%	%	%	%	%	%	%
Marital status								
Single	86.5	91.9	59.5	70.3	86.8	86.8	78.0	78.0
Married/living together	13.5	8.1	40.5	29.7	13.2	13.2	22.0	22.0
Educational level								
0–9 years	–	–	–	2.7	–	–	–	–
10–12 years	40.5	40.5	45.9	45.9	36.8	36.8	43.9	43.9
13 or more years	59.5	59.5	54.1	51.4	63.2	63.2	56.1	56.1
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
IIEF/IIIEF-MSM/FSFI total score	60.30 (11.72)	72.53 (5.54)	56.62 (13.36)	65.87 (7.07)	13.68 (3.54)	30.12 (2.90)	16.63 (2.55)	30.12 (2.52)

IIEF total score range from 5 to 75; IIIEF-MSM total score range from 5 to 110; and FSFI total score range from 2 to 36

Table 2 Means and standard deviations for the Questionnaire of Cognitive Schemas Activated in Sexual Context and dimensions as a function of group and sexual orientation in the male sample (n = 148)

Cognitive schemas	Sexually dysfunctional group			Sexually functional group			Total		
	Gay men (n = 37) M (SD)	Heterosexual men (n = 37) M (SD)	Total (n = 74) M (SD)	Gay men (n = 37) M (SD)	Heterosexual men (n = 37) M (SD)	Total (n = 74) M (SD)	Gay men (n = 74) M (SD)	Heterosexual men (n = 74) M (SD)	Total (n = 148) M (SD)
	Undesirability/rejection	13.43 (0.83)	12.68 (0.83)	13.05 (0.59)	12.35 (0.83)	9.70 (0.83)	11.03 (0.59)	12.89 (0.59)	11.19 (0.59)
Incompetence	15.05 (0.99)	17.54 (0.99)	16.30 (0.71)	13.84 (0.99)	11.35 (0.99)	12.60 (0.71)	14.45 (0.71)	14.45 (6.41)	14.45 (6.41)
Self-depreciation	5.22 (0.37)	5.89 (0.37)	5.55 (0.26)	5.05 (0.37)	4.08 (0.37)	4.57 (0.26)	5.14 (0.26)	4.99 (0.26)	5.06 (2.29)
Difference/loneliness	8.68 (0.44)	7.78 (0.44)	8.23 (0.31)	7.22 (0.44)	6.14 (0.44)	6.68 (0.31)	7.95 (0.31)	6.96 (0.31)	7.45 (2.83)
Helpless	4.76 (0.31)	4.73 (0.31)	4.74 (0.22)	4.54 (0.31)	3.30 (0.31)	3.92 (0.22)	4.65 (0.22)	4.01 (0.22)	4.33 (1.94)
QCSASC total	47.14 (2.41)	48.62 (2.41)	47.88 (1.70)	43.00 (2.41)	34.57 (2.41)	38.78 (1.70)	45.07 (1.70)	41.60 (1.70)	43.33 (15.50)

Ranges of 7–35 for Undesirability/rejection and Incompetence; 3–15 for Self-depreciation and Difference/loneliness; 2–10 for Helpless; and 28–140 for QCSASC total

performed, with the five factors from the QCSASC (Undesirability/rejection, Incompetence, Self-depreciation, Difference/loneliness, and Helpless) as dependent variables. Marital status was included as covariate in order to control its effects on cognitive schemas, Wilk's $\lambda = 0.932$, $F(5, 139) = 2.032$, $p = .078$, partial $\eta^2 = 0.068$. Table 2 shows the means and standard deviations of the groups on the QCSASC domains and total scores. Significant main effects were found for sexual problems, Wilk's $\lambda = 0.872$, $F(5, 139) = 4.091$, $p = .002$, partial $\eta^2 = 0.128$, but not for sexual orientation, Wilk's $\lambda = 0.953$, $F(5, 139) = 1.364$, $p = .241$, partial $\eta^2 = 0.047$, or for the interaction between both effects, Wilk's $\lambda = 0.932$, $F(5, 139) = 2.043$, $p = .076$, partial $\eta^2 = 0.068$.

As presented on Table 3, results from univariate analysis indicated that men with sexual problems scored significantly higher on the activation of cognitive schemas of Undesirability/rejection ($p = .016$; partial $\eta^2 = 0.040$), Incompetence ($p < .001$; partial $\eta^2 = 0.086$), Self-depreciation ($p = .008$; partial $\eta^2 = 0.049$), Difference/loneliness ($p < .001$; partial $\eta^2 = 0.092$), and Helpless ($p = .005$; partial $\eta^2 = 0.053$) compared with sexually healthy men. Additionally, univariate tests also indicated that the activation of cognitive schemas of Incompetence ($p = .014$; partial $\eta^2 = 0.041$), Self-depreciation ($p = .025$; partial $\eta^2 = 0.034$), and Helpless ($p = .043$; partial $\eta^2 = 0.028$) were able to discriminate sexually functional and dysfunctional heterosexual men, but not gay men.

A hierarchical regression analysis was performed to explore the relationship between cognitive schemas activated in sexual context and male sexual functioning (assessed by the IIEF; Coyne et al. 2010; Rosen et al. 1997). Male sexual functioning was the criterion variable, age and marital status were entered in the first step, and sexual orientation (dummy variable: 0 = gay men; 1 = heterosexual men) was entered in the second step. Cognitive schemas activated in sexual context (assessed by the QCSASC; Nobre and Pinto-Gouveia 2009a) were introduced in the third step. The inclusion of cognitive schemas in the third step accounted for a significant increment in the prediction of sexual functioning over and above age, marital status, and sexual orientation, $R^2_{change} = .304$, $F(5, 100) = 9.544$, $p < .001$. Both Undesirability/rejection ($\beta = -0.393$; $p = .003$) and Incompetence schemas ($\beta = -0.303$; $p = .010$) were significant predictors of male sexual functioning, indicating that the higher the activation of these schemas in response to negative sexual events the lower the sexual functioning.

Cognitive Schemas in Sexual Context, Sexual Orientation, and Sexual Problems in Women

Table 4 shows means and standard deviations for each factor of the QCSASC as a function of group and sexual

Table 3 Cognitive schemas activated in sexual context as a function of group, sexual orientation, and group \times sexual orientation for male sample ($N = 148$)

Cognitive schemas	Group ^a			Sexual orientation			Group \times sexual orientation		
	$F(4, 143)$	p	η^2	$F(4, 143)$	p	η^2	$F(4, 143)$	p	η^2
Undesirability/rejection	5.917	.016	0.040	3.681	.057	0.025	1.296	.257	0.009
Incompetence	13.385	<.001	0.086	0.004	.951	0.000	6.127	.014	0.041
Self-depreciation	7.322	.008	0.049	0.103	.748	0.001	5.106	.025	0.034
Difference/loneliness	14.553	<.001	0.092	2.013	.158	0.014	0.093	.761	0.001
Helpless	8.005	.005	0.053	2.517	.115	0.017	4.160	.043	0.028

Multivariate analysis of variance; Bonferroni adjustment for multiple comparisons

^a Group: sexually functional men versus sexually dysfunctional men

orientation. In order to assess the main effects of group and sexual orientation, and its interaction on the activation of cognitive schemas in sexual context, a 2 (with vs. without sexual problems) \times 2 (lesbian vs. heterosexual women) MANOVA was performed, with the five factors of the QCSASC (Undesirability/rejection, Incompetence, Self-depreciation, Difference/loneliness, and Helpless) as dependent variables. Significant main effects were found for sexual problems, Wilk's $\lambda = 0.921$, $F(5, 150) = 2.589$, $p = .028$, partial $\eta^2 = 0.079$, and for sexual orientation, Wilk's $\lambda = 0.868$, $F(5, 150) = 4.557$, $p = .001$, partial $\eta^2 = 0.132$, but not for the interaction between main effects, Wilk's $\lambda = 0.991$, $F(5, 150) = 0.281$, $p = .923$, partial $\eta^2 = 0.009$.

As shown in Table 5, univariate effects indicated that women with sexual problems scored significantly higher on the activation of cognitive schemas of Undesirability/rejection ($p = .049$; partial $\eta^2 = 0.025$), Incompetence ($p = .019$; partial $\eta^2 = 0.035$), and Difference/loneliness ($p = .001$; partial $\eta^2 = 0.067$). Also, univariate tests indicated that lesbian women scored higher on the activation of cognitive schemas of Undesirability/rejection ($p = .022$; partial $\eta^2 = 0.034$), Difference/loneliness ($p = .001$; partial $\eta^2 = 0.073$), and Helpless ($p < .001$; partial $\eta^2 = 0.116$).

To explore the association between cognitive schemas activated in sexual context and female sexual functioning (assessed by the Female Sexual Functioning Index; Rosen et al. 2000), a hierarchical regression analysis was also conducted. Sexual functioning was the criterion variable, age was entered in the first step, and sexual orientation (dummy variable: 0 = lesbian women; 1 = heterosexual women) was entered in the second step. Cognitive schemas activated in sexual context (assessed by the QCSASC; Nobre and Pinto-Gouveia 2009a) were introduced in the third step. Sexual orientation significantly explained sexual functioning over and above age, $R^2_{change} = .044$, $F(1, 124) = 5.694$, $p = .019$, with lesbian women predicting lower levels of sexual functioning. Cognitive schemas

activated in sexual context did not account for a significant increment in the proportion of explained sexual functioning in women, above and beyond age and sexual orientation, $R^2_{change} = .064$, $F(5, 119) = 1.705$, $p = .139$.

Discussion

The role of cognitive schemas activated in response to negative sexual events has been supported, based on evidence from studies conducted exclusively with heterosexual samples of men and women (Nobre 2010; Nobre and Pinto-Gouveia 2008, 2009b; Oliveira and Nobre 2013; Quinta-Gomes and Nobre 2012a). This study is the first to explore the role of activation of negative cognitive schemas on sexual dysfunction in gay men or lesbian women. The main findings extended the pattern found among heterosexuals, namely that men and women with sexual problems report significantly greater activation of negative schemas when exposed to negative sexual events, compared with sexually healthy controls, regardless of sexual orientation.

Men with sexual problems activated significantly more cognitive schemas of Incompetence, Difference/loneliness, Undesirability/rejection, Helpless, and Self-depreciation, when compared with sexually functional men. Our findings were in line with previous studies indicating that sexually dysfunctional heterosexual men activate more negative cognitive schemas than sexually healthy heterosexual men (Nobre 2010; Nobre and Pinto-Gouveia 2009b; Quinta-Gomes and Nobre 2012b). Moreover, women with sexual problems activated significantly more cognitive schemas of Difference/loneliness, Incompetence, and Undesirability/rejection, compared with sexually healthy controls. These findings were also in line with previous data (Nobre and Pinto-Gouveia 2008, 2009b; Oliveira and Nobre 2013).

Among women, sexual orientation also presented a significant main effect, indicating that lesbian women activated significantly more cognitive schemas of Difference/loneliness, Helpless, and Undesirability/rejection schemas,

Table 4 Means and standard deviations for the Questionnaire of Cognitive Schemas Activated in Sexual Context and dimensions as a function of group and sexual orientation in the female sample (N = 158)

Cognitive schemas	Sexually dysfunctional group		Sexually functional group		Total	
	Lesbian women (n = 38)	Heterosexual women (n = 41)	Lesbian women (n = 38)	Heterosexual women (n = 41)	Lesbian women (n = 76)	Total (n = 158)
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Undesirability/rejection	10.63 (0.66)	9.37 (0.64)	9.99 (0.46)	7.83 (0.64)	10.11 (0.47)	9.32 (4.57)
Incompetence	13.50 (0.98)	11.59 (0.95)	12.54 (0.68)	9.68 (0.95)	12.17 (0.70)	11.37 (6.17)
Self-deprecation	4.40 (0.28)	4.00 (0.27)	4.20 (0.20)	3.56 (0.27)	4.33 (0.20)	4.04 (1.75)
Difference/loneliness	7.50 (0.42)	6.17 (0.41)	6.84 (0.29)	4.66 (0.41)	6.87 (0.30)	6.11 (2.78)
Helpless	3.95 (0.25)	3.00 (0.24)	3.47 (0.17)	2.44 (0.24)	3.80 (0.17)	3.24 (1.61)
QCSASC total	39.97 (2.14)	34.12 (2.06)	37.05 (1.48)	28.17 (2.06)	37.28 (1.51)	34.09 (13.70)

Ranges of 7–35 for Undesirability/rejection and Incompetence; 3–15 for Self-deprecation and Difference/loneliness; 2–10 for Helpless; and 28–140 for QCSASC total

compared with heterosexual women. Lesbian women, regardless of having a sexual problem or not, activated significantly more negative cognitive schemas when facing an unsuccessful sexual event. More specifically, lesbian women more frequently felt “needy”, “lonely” and “defective” when exposed to a negative sexual episode.

Although no interaction effect between sexual problems × sexual orientation was found, univariate analysis in the male sample suggested that the activation of cognitive schemas of Incompetence, Self-depreciation, and Helpless might significantly differentiate between heterosexual men with and without sexual problems, but not gay men. Sexually healthy gay men reported only slightly lower activation of cognitive schemas, compared to gay men with sexual problems. Our data suggests that some cognitive schemas activated that are central to explaining differences between heterosexual men with and without sexual problems are no longer helpful in distinguishing gay men with and without sexual problems. One important example is the activation of Incompetence schema, found to be the strongest predictor of sexual problems in heterosexual men, but which seems less important to sexual problems in gay men. More specifically, heterosexual men with sexual problems activated significantly more Self-depreciation and Helpless schemas, suggesting that negative sexual episode often trigger core beliefs such as “I’m unworthy” and “I’m vulnerable”, for instance. Similar findings were not found in the gay men sample, suggesting that heterosexual men with sexual problems are more likely to interpret negative events as a sign of worthless and vulnerability compared with gay men. Additionally, heterosexual men reported higher rates of being married/living together, which may help explain why they activate schemas more often related to unworthiness and vulnerability, when facing a negative sexual event.

Regarding sexual orientation, findings indicated its significant effect in the female sample, with lesbian women activating significantly more negative cognitive schemas (particularly Helpless, Difference, and Undesirability/rejection) when exposed to unsuccessful sexual episodes, regardless of whether they had a sexual problem. Although there was no previous hypothesis for this result, several clinical considerations should be considered. First, this finding suggests that lesbian women tend to interpret unsuccessful sexual events as more negative and may be more likely to develop sexual problems compared with heterosexual women. Also, as suggested by Masters and Johnson (1979), lesbian women appear to be more oriented towards the partner’s satisfaction. It is possible that for lesbian women not performing sexually and, consequently, not satisfying the partner, may promote cognitions such as “I am needy”, “I am different”, “I am bound to be rejected”. Second, negative cognitive schemas have been

Table 5 Cognitive schemas activated in sexual context as a function of group, sexual orientation, and group \times sexual orientation for female sample ($N = 158$)

Cognitive schemas	Group ^a			Sexual orientation			Group \times sexual orientation		
	<i>F</i> (3, 154)	<i>p</i>	η^2	<i>F</i> (3, 154)	<i>p</i>	η^2	<i>F</i> (3, 154)	<i>p</i>	η^2
Undesirability/rejection	3.950	.049	0.025	5.357	.022	0.034	0.138	.711	0.001
Incompetence	5.572	.019	0.035	2.532	.114	0.016	0.153	.696	0.001
Self-deprecation	1.060	.305	0.007	3.916	.050	0.025	0.308	.580	0.002
Difference/loneliness	11.104	.001	.067	12.187	.001	0.073	0.089	.765	0.001
Helpless	3.115	.080	0.020	20.213	<.001	0.116	0.318	.574	0.002

Multivariate analysis of variance; Bonferroni adjustment for multiple comparisons

^a Group: sexually functional women versus sexually dysfunctional women

described as vulnerability factors for clinical depression (e.g. Beck 1995). Regarding mental health issues, mood disorders (e.g. clinical depression; anxiety disorders; emotional stress) are highly prevalent in lesbian women (Cochran et al. 2003; Koh and Ross 2006; Sandfort et al. 2001). Although being part of a minority group per se is not a risk factor for psychological maladjustment (Koh and Ross 2006), feeling distressed about sexual orientation discrimination increases the odds of having a mental health problem (Koh and Ross 2006; Mays and Cochran 2001; Sandfort et al. 2006, 2009). Therefore, feelings and cognitions common among lesbian women due to their sexual orientation may have an important impact on their sexual interactions and sexual functioning. Clinical implications should be acknowledged. Health professionals should be alert to the specific cognitive-emotional vulnerabilities presented by lesbian women. Also, sex education policies should consider developing prevention and sexual health promotion programs targeted for non-heterosexual individuals.

To explore the relationship between the activation of cognitive schemas in sexual context and sexual functioning in men and women, two regression analyses were performed, with sexual functioning entered as the criterion variable. Although sexual functioning in these analyses did not take into account the levels of personal distress associated with probable sexual difficulties, results added a significant input to current findings. In the male sample, cognitive schemas activated in response to negative sexual events significantly predicted sexual functioning, above and beyond age, marital status, and sexual orientation. In particular, greater activation of negative cognitive schemas in sexual context predicted lower sexual functioning in gay and heterosexual men. These findings were in consonance with the multivariate analysis, supporting the relationship between the activation of negative cognitive schemas and sexual function/dysfunction. Concerning women, results have indicated a significant effect of sexual orientation on sexual functioning after controlling for age. Lesbian women in this sample tended to present with lower levels

of sexual functioning. On the other hand, our hypothesis that the activation of cognitive schemas would significantly predict female sexual functioning above and beyond age and sexual orientation was not supported. However, these findings may be interpreted in a way that is consistent with the results of the multivariate analysis, suggesting that lesbian women activate significantly more cognitive schemas in response to negative sexual events, when compared to heterosexual women. A possible explanation for this finding may be related to the greater activation of cognitive schemas in sexual context presented by lesbian women, regardless of reporting distressed sexual problems. Additionally, the fact that the measure of sexual functioning (based on the FSFI scores) used as criterion variable in the regression analysis did not include levels of associated distress may also partly explain the absence of a significant effect. In other words, it would be expected that the effect of the activation of cognitive schemas in sexual context would be particularly relevant in predicting distress associated to sexual functioning.

Cognitive schemas have been conceptualized as vulnerability factors for psychopathology (Beck 1995, 1996) including sexual dysfunction (Barlow 1986; Carey et al. 1993; Nobre 2013; Sbrocco and Barlow 1996; Wiegel et al. 2007). Previous research has supported the role of cognitive schemas activated in sexual dysfunction among heterosexual men and women (Nobre 2010; Nobre and Pinto-Gouveia 2008, 2009b; Oliveira and Nobre 2013; Quinta-Gomes and Nobre 2012b). Also, cognitive-behavioral interventions were found to be effective for sexual dysfunctions among heterosexual men and women (cf. McCabe 2001). As illustrated by Hart and Schwartz (2010), dysfunctional sexual beliefs, similar to those previously found in heterosexual samples (e.g. Nobre and Pinto-Gouveia 2006), are important variables in the clinical work with gay men with erectile disorder. The present study was the first conducted in gay men and lesbian women, and gives additional support to the role of the activation of cognitive schemas on sexual problems in this population.

Despite the relevance of the current findings, some limitations should be acknowledged. A convenience sample was collected using a web survey. Therefore, only volunteers with internet access were able to participate in the current study. Additionally, heterosexual men reported higher rates of married/living together, which was controlled by adding marital status as a covariate when the MANCOVA was performed. Although same-sex marriage was recently legislated in Portugal and, consequently, interferes in current data, cohabitation (living together) has been allowed, even when marriage was illegal, which may have an impact on current findings. Nonetheless, these are preliminary findings and need further replication.

Sexual problems were self-perceived and, although temporal criteria and related distress were assessed, a clinical diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders (APA 2013) was not assigned by a clinician. Also, although available, data from the IIEF (Rosen et al. 1997) and FSFI (Rosen et al. 2000), were not used to differentiate the groups of men and women with sexual problems since these measures do not take into account important criteria defined by Diagnostic and Statistical Manual of Mental Disorders (APA 2013), such as time since the onset (6 months) and distress related to sexual difficulties, a fundamental aspect highlighted in previous studies (Lau et al. 2006; Mitchell et al. 2013; Peixoto and Nobre 2015; Stephenson and Meston 2012).

The most commonly reported difficulties in heterosexual men and women with self-perceived sexual problems within our study differ from those most typically observed in clinical samples. For example, the most frequently reported problem in women, when the levels of associated distress are considered, was sexual pain, rather than lack of sexual desire. This finding is consistent with a previous study conducted in a sample of heterosexual and lesbian women, and may be explained partially because of the young age of the participants as well as the potential negative impact and distress associated with the experience of pain in sexual interactions (Peixoto and Nobre 2014). For heterosexual men in the sample, delayed ejaculation represents the most common sexual problem experienced, rather than premature ejaculation.

The QCSASC (Nobre and Pinto-Gouveia 2009a) is a valid measure for heterosexual men and women. In the present study, minor modifications were made to the QCSASC (specifically in the hypothetical scenarios describing negative sexual events) to increase the applicability for non-heterosexual individuals. Reliability analyses in the present study indicated excellent values for both heterosexual and homosexual samples, suggesting that the measure is also suitable for use in non-heterosexual men and women. Nevertheless a psychometric study is being

conducted in a different sample of gay men and lesbian women to further test the applicability of the QCSASC in non-heterosexual samples.

Finally, the current study aimed at assessing cognitive schemas in heterosexual and homosexual men and women. The inclusion of bisexual men and women was considered, however methodological problems (related to the nature of the measures used) as well as difficulties in recruiting a sizeable sample precluded its integration in the present study.

Despite these limitations, this was the first study attempting to understand the role of cognitive schemas on sexual problems in a sample of gay men and lesbian women. Further studies are needed in order to test the role of cognitive schemas activated by gay men and lesbian women with specific sexual disorders (e.g. erectile disorder; genito-pelvic pain disorder). Also, future studies should consider including bisexual individuals in order to expand current knowledge. Overall, the present findings support the important role of cognitive schemas activated in sexual problems in heterosexual and homosexual individuals. Specifically, findings suggested that the core cognitive schemas associated with sexual dysfunction are very similar in heterosexual individuals, gay men and lesbian women. Moreover, lesbian women reported greater activation of negative schemas compared with heterosexual women, regardless of having a sexual problem. Taken together these findings encourage the use of cognitive treatment interventions, particularly oriented to questioning the meaning that individuals assign to negative sexual events, regardless of sexual orientation. Importantly, the fact that lesbian women reported activating more schemas in response to negative sexual events when compared with heterosexual women, suggests that they are more vulnerable to making negative interpretations and may be more at risk of developing sexual difficulties. Therefore, specific programs designed to prevent possible catastrophic interpretations of negative sexual events may be helpful in particular for lesbian women.

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Conflict of Interest Maria Manuela Peixoto and Pedro Nobre declare that they have no conflict of interest.

Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all participants for being included in the study.

Animal Rights No animal studies were carried out by the authors for this article.

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