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Religiosity and Sexual Behavior: Tense Relationships and Underlying Affects and Cognitions in Samples of Christian and Muslim Traditions

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Summary

Religion's historical mistrust of sexuality shapes people's behavior by inhibiting liberal sexuality. Still, it is unclear whether this inhibitive role also includes common, normative sexual behavior, particularly in secularized contexts. Moreover, the possible mediating effects emotions, affects, and thoughts have on the association between religiosity and restricted sexuality have never been integrated into a single model. Finally, cross-religious differences in common sexual behavior have still yet to be documented. We addressed these three issues in two studies, with samples of Catholic and Muslim tradition (total $N = 446$). Consistently across samples, religiosity predicted, either directly or indirectly, less frequent common heterosexual behaviors and masturbation, partly through sexual guilt and inhibition, and/or decreased sexual fantasy and the search for sexual pleasure. However, married Muslims' religiosity, unlike Catholics', did not directly undermine fertility-oriented sexuality and the search for pleasure. Religion's role in restricting sexuality seems to be rooted in deep psychological rationale.

Keywords

religion – sexual behavior – guilt – disgust – Islam – Catholicism

1 Introduction¹

The major world religions have traditionally been suspicious of sexuality, or at least of some aspects of it, and have established norms aiming to regulate and restrict sexuality (Hunt & Yip, 2012; Thatcher, 2015). Is this suspicion part of a historical past or does it translate into contemporary religious peoples' sexual lives, in particular in modern secularized contexts? There has been substantial psychological research investigating the links between religion and sexuality (see below). The present study aims to advance our knowledge in this domain in three ways. First, it focuses on common, conventional, and normative heterosexual behavior and masturbation, and not on attitudes toward liberal and permissive sexuality such as extramarital sex and homosexuality. Moreover, it integrates various cognitive and affective constructs into a single set to test their possible role in mediating and explaining the relationship between religiosity and (restricted) sexual behavior. Finally, it examines the similarities and differences in the associations between religiosity and sexual behavior between participants of Christian and Muslim traditions. Below we review the relevant research, develop the rationale of the present work, and formulate our expectations.

2 Religiosity and (Restricted) Sexuality

Evidence from studies on single religious or ethnic groups, or more than one group within the same country, shows that religious people, when compared to non-religious people, tend to report lower sexual interest, search less for sexual opportunities, experience sexual intercourse for the first time at a later age, have fewer premarital or extramarital relationships, engage in fewer unconventional sexual behaviors (same-sex relations, multiple-partner sex, oral, and anal sex), and also report fewer sexual behaviors that are widely considered to be conventional, natural, and appropriate, such as masturbation, foreplay, and vaginal intercourse within heterosexual marriage (e.g., Baćak & Štulhofer, 2011; de Visser, Smith, Richters, & Rissel, 2007; Farmer, Trapnell, & Meston, 2009;

1 This work is part of the doctoral dissertation of Caroline Rigo (CR) under the supervision of Vassilis Saroglou (VS). Results of Study 1 were presented at the International Association for Psychology of Religion Conference (Istanbul, Turkey, August, 2015). Results of Study 2 were presented at the 2nd International Convention for Psychological Science (Wien, Austria, March, 2017). Data of Study 1 were collected by CR. Data of Study 2 were collected by Kenza Walli El Marsni, for her Master's thesis, under the supervision of CR and VS. CR analyzed the data from both studies. CR and VS contributed equally to the writing of the paper.

Hull, Hennessy, Bleakley, Fishbein, & Jordan, 2011; Regnerus, 2007; see also, for reviews: Hernandez, Mahoney, & Pargament, 2013; Li & Cohen, 2014). However, most of that research has been carried out in one country, i.e., the US, whereas studies in secular contexts such as Europe have primarily focused on how religiosity relates to unconventional liberal sexual behaviors (e.g., homosexuality or multiple partners), which are typically considered immoral within religion. Thus, it has not been clearly empirically established that, even in very secular contexts, religiosity may be negatively related to common, conventional, and normative sexual behavior limited to heterosexual couples, i.e., sexual behavior that is not clearly qualified as immoral within religion.

Similarly, evidence from large international studies suggests that the relationship between religiosity and restrictive socio-sexuality is present across religions, countries, and major world regions, though there may be differences in the strength of the effects as a function of characteristics at the individual and societal level (e.g., Adamczyk & Hayes, 2012; Hoffarth, Hodson, & Molnar, 2018; Jung, 2016; Schmitt & Fuller, 2015; see Saroglou, 2019, for review). Nevertheless, these data typically focus on indicators of a strong moral divide between conservatives and liberals, such as attitudes toward homosexuality, premarital and extramarital sex, and number of partners, or use a broad global index of sexual attitudes. Thus, they do not provide specific information on the more common and conventional sexual behavior that is broadly present in heterosexual couples' and individuals' lives, such as sexual intercourse, kissing, foreplay, oral sex, and masturbation.

It is important to note that the above-mentioned large body of evidence attesting to a negative association between religiosity and (permissive) sexual attitudes and behavior applies to measures of personal, general religiosity and indicators of various aspects and forms of religious beliefs, practices, and attitudes. Nevertheless, this negative association is weaker or in-existent when it comes to: (1) the *religion-as-quest* orientation (e.g., Rowatt & Schmitt, 2003), which is heavily characterized by religious doubt; (2) *spirituality* (Brelsford, Luquis, & Murray-Swank, 2011; Woo, Morshedian, Brotto, & Gorzalka, 2012), which denotes attachment to the sacred independently from religious institutions; and (3) the specific orientation called *sanctification of sexuality in marital/loving relationships*, i.e., seeing a sexual union as sacred and encouraged by God (Hernandez et al., 2013), which by definition implies positive attitudes toward sexuality.

Beyond cross-sectional studies based on self-reports, longitudinal and experimental studies have further confirmed the contrast between religion and sexuality, and do so in both causal directions. Longitudinal evidence (see earlier reviews: Rostosky, Wilcox, Wright, & Randall, 2004; Zimmer-Gembeck

& Helfand, 2008) shows that religious factors predict later restricted socio-sexuality (Hull et al., 2011; Pedersen, 2014), and a decrease of religiosity predicts a later increase of sexual behavior (Aalsma et al., 2013). Inversely, sexual experience predicts a later decrease of religious/spiritual interests (Grubbs, Exline, Pargament, Volk, & Lindberg, 2017; Vasilenko & Lefkowitz, 2014). Similarly, supraliminal religious priming invokes Belgian adults to more negatively evaluate erotic—simply sensual and semi-nude—pictures and dedicate less time to looking at them (Rigo & Saroglou, 2013). Inversely, immersion in a sexual mindset, through remembering one's personal sexual experiences, provokes Western Europeans to lower their spiritual interests and moral behavioral tendencies (Rigo, Uzarevic, & Saroglou, 2016).

In line with the substantial above-mentioned cross-sectional, longitudinal, and experimental evidence, we expected religiosity to be negatively related to intense sexual behavior, measured in our study as the frequency of various kinds of sexual acts, be they religiously or socially unconventional and non-universally normative (anal sex), not encouraged (masturbation), or religiously tolerated or accepted, socially encouraged, conventional and normative heterosexual behavior. A critical reason for this expectation comes from substantial evidence showing a fundamental opposition between religion and sensual pleasure: even among young people of very secular Western European countries in the 1990s and 2000s, religiosity is typically associated with a low endorsement of the value of hedonism (Roccas & Elster, 2014; Saroglou, Delpierre, & Dernelle, 2004; Schwartz, 2012).

3 Related Affects and Thoughts

How and why does religiosity predict low and restrictive sexual behavior? We hypothesized that religiosity is related to key moral emotions (guilt and disgust), physiology-based individual differences (inhibition), and affective and cognitive dispositions (low search for sexual pleasure and low sexual fantasy), which in turn diminish sexual behavior. For some of these constructs, evidence already exists regarding their mediating role on the relationship between religion and sexuality; the other constructs are tested here for the first time to our knowledge. By integrating all of these constructs into a single model, this study takes an additional step forward with regard to the existing literature.

Sexual guilt denotes the belief that sex is immoral and that sexual thoughts and acts are subject to punishment (Mosher & Cross, 1971). Most religions, at least the monotheistic ones, have associated sexuality, or aspects of it, with sin and subsequent punishment. In Christianity for instance, the original sin

has received a sexual connotation for centuries. Being familiar with Judeo-Christian culture, Freud (1907/1961) argued that the religious aim is to both allow a canalized expression of sexual guilt and to repress sexual desire. Several studies, consistently across decades, have shown that religiosity is positively related to sexual guilt, which in turn leads to more restrictive sexuality (e.g., Gunderson & McCary, 1979; Woo et al., 2012; Wyatt & Dunn, 1991).

Sensitivity to disgust and the related moral value of *purity* refer to thoughts and feelings of fear of contamination by unhealthy, dirty, and/or immoral elements, and this extends from the physical to the moral domain (Rozin, Haidt, & McCauley, 2016). Purity is a central value in the experience of the sacred, the latter even being defined as a space that is separated from the “profane” in order to avoid contamination. The roles of disgust and purity apply to religious beliefs (orthodoxy vs. heresy; Ritter, Preston, Salomon, & Relihan-Johnson, 2016), rituals (of moral cleanliness: Preston & Ritter, 2012), norms (of sexual and family morality; Deak & Saroglou, 2015; Olatunji, 2008), and groups (to protect themselves from ecumenism, schisms, and society’s immorality, mostly sexual; e.g., Ritter & Preston, 2011).

Disinhibition refers to a physiology-based disposition to prefer “out of control” activities. Not surprisingly, it fuels sexual desire and behavior (see the disinhibiting role of alcohol and peer pressure in sexual experiences: Dogan, Stockdale, Widaman, & Conger, 2010; Epstein et al., 2014), and does so even longitudinally (Khurana et al. 2012; Riggs et al., 2013). This disposition contrasts with what is at the heart of religiosity, i.e., a “moral muscle”, self-control, and inhibitory resistance to temptations (Baumeister & Exline 1999; McCullough & Carter, 2013, for a review). In favor of the idea that religion and disinhibition are mutually exclusive, especially with regard to sexuality, evidence shows that disinhibition in puberty predicts religious doubt (Saroglou, 2012), and that a sexual experience decreases spiritual aspirations among those high in disinhibition (Rigo et al., 2016).

Search for *sexual pleasure* is very likely the most critical motive for (frequent) sexual behavior (Meston & Buss, 2007). Similarly, *sexual fantasy* is an important contributor to sexual desire and has a central role in the maintenance, anticipation, and repetition of sexual activities, including solitary ones (Leitenberg & Henning, 1995). Search for pleasure and fantasy constitute affective and cognitive components of sexual desire. With regard to religiosity, these cannot simply be considered as constructs that overlap with (intense) sexual behavior and permissive sexuality. If religious morality inhibits immoral acts more than immoral thoughts (e.g., among Jews: Cohen & Rozin, 2001), then the negative association between religiosity and sexual behavior should be clearer than that between religiosity and sexual fantasy and the search for pleasure.

However, given the clear associations reported above between religiosity and a low consideration of the value of hedonism and low impulsivity and disinhibition, we expected religiosity to predict low sexual pleasure and fantasy and, in turn, low sexual behavior. Indeed, there is evidence that intrinsic religiosity, not only conservative and fundamentalist religiosity, predicts low sexual fantasy (Ahrold, Farmer, Trapnell, & Meston, 2011).

4 A Cross-Cultural/Religious Perspective: Christianity and Islam

Do theory and evidence on the relationships between religion and sexual behavior apply to all religions, or at least to all monotheistic ones? In this work, we focused on Christianity and Islam. The fact that both Christianity and Islam have established rules and justifications across centuries aiming to canalize, if not restrict, sexuality, or at least some aspects of it (Hunt & Yip, 2012; Thatcher, 2015), suggests that both religions sustain some negative views about sexuality that should translate into contemporary religionists' sexual attitudes and behaviors across both religions. Moreover, the fact that large international studies (Saroglou, 2019, for a recent review) have found that individuals' Christian and Muslim affiliation and a country's Christian or Muslim heritage imply a lower tolerance of specific sexual and family-related behaviors (homosexuality, divorce, premarital, and extramarital relations) compared, respectively, to non-religious individuals and secular contexts, indicates strong commonalities between these two religions in the way sexuality is affected. From a more psychological perspective, a low consideration for the value of hedonism (Saroglou et al., 2004) and a strong valorization of an ascetic perspective in life, for instance in work (Saroglou, 2019, for review), have been found to be typical of both Christian and Muslim persons and societies.

However, beyond these commonalities, it is possible that religiosity in an Islamic context may have different outcomes than Christian religiosity, either on sexuality in general, or on some particular sexual issues. Two rationales suggest predictions that diverge, to some extent. On the one hand, large international studies have indicated that restrictive sexuality- and family-related morality has a much stronger presence among Muslims than among Christians, even if they both differ similarly from the morality of nonbelievers (Adamczyk & Hayes, 2012; Hoffarth et al., 2018; Malka, 2014; Norris & Inglehart, 2004). Thus, one should expect greater concern, suspicion, and restriction regarding sexual behaviors, including mainstream behaviors, among Muslims compared to Christians. This could be explained for instance by greater sensitivity to disgust and a stronger attachment to purity.

On the other hand, there is an extensive religious tradition in Islam of intra-marital sexuality being valued, in particular when oriented toward fertility, making this normative heterosexual behavior well accepted (Dialmy, 2010). Fertility rates of Muslims are typically higher than those of Christians across all major world regions (Pew Research Center, 2017). In Catholicism in particular, chastity has been even more highly valued than marriage and family. Thus, one may expect Islamic religiosity to be negatively associated with various other sexual behaviors, but not with mainstream, fertility-oriented, intra-marital, normative sexuality. Similarly, in this context, some critical determinants of sexual behavior, such as the search for sexual pleasure, may not be negatively affected by Islamic religiosity.

5 Overview of the Studies

In two studies, we investigated the relationships between religiosity and various aspects of sexual behavior, mostly normative conventional heterosexual acts, but also less conventional sexual practices, i.e., anal sex and masturbation. We also investigated whether religiosity predicts relevant moral emotions, affects, and thoughts, specifically high sexual guilt, high sensitivity to disgust/attachment to purity, low disinhibition, low sexual fantasy, and low search for sexual pleasure, and whether these effects can explain the relationship between religiosity and less frequent sexual behavior. We also examined the possible roles of gender and relational status. Participants in Study 1 were Western Europeans of Christian tradition. Study 2 aimed to replicate the findings of Study 1 among Westerners or North Africans of Muslim tradition and identify possible cross-religious differences, in particular differences stemming from Islam's clearer emphasis on intra-marital sexuality and fertility.

6 Study 1

7 Method

7.1 *Participants*

Participants were 276 adults ranging in age from 17 to 77 years old ($M = 24.46$, $SD = 7.28$; 58% women) recruited on social networks (French-speaking). Participants were mostly from Belgium (62%) and France (29%), with the

remaining participants coming from other countries (9%). In terms of religious affiliation/conviction, participants were Catholics (47%), atheists (39%), and agnostics (12%), and the remaining 2% reported "other". Sixty-three percent of the participants reported being in a relationship, and 37% reported being single. The original sample was slightly larger (316), but, given the study's focus on heterosexuality, we excluded 30 participants from the analyses who reported being a virgin and 10 participants who self-identified as gay or lesbian. The number of participants was determined to ensure a sufficient power of .80, based on previous evidence on the associations between religiosity and sexual attitudes and behaviors (r s typically varying from .15 to .25).

7.2 Measures

7.2.1 Religiosity

Personal religiosity was measured through a 3-item religiosity index that included questions about the importance of God and the importance of religion in the participant's personal life, as well as the frequency of prayer ($\alpha = .89$; 7-point Likert scales). This index has been found to reflect intrinsic religiosity (Saroglou & Mathijsen, 2007).

7.2.2 Mediators

Participants first completed measures of sexual guilt, sensitivity to disgust, purity as a moral foundation, and disinhibition, using 7-point Likert scales. *Sexual guilt* was measured through the 10-item revised Mosher Sex-Guilt Scale (Janda & Bazemore, 2011; α in the present data = .75). A sample item is "When I have sexual dreams I try to forget them". *Sensitivity to disgust* was measured through the 12 Likert-type statements of the revised Disgust scale (Olatunji et al., 2007). A sample item is "If I see someone vomit, it makes me sick to my stomach". The value placed on *purity* (considering the body as a temple that can be desecrated by immoral activities and contaminants) was assessed through six items from the Moral Foundations Questionnaire (Graham et al., 2011; $\alpha = .65$). A sample item consists of evaluating "Whether or not someone violated standards of purity and decency". For the economy of the analyses and the presentation of results, we averaged the sensitivity to disgust items and the purity items for each participant (a variable hereafter called "disgust/purity"; $\alpha = .72$). Finally, we included the 10 items of the *Disinhibition* subscale of the Sensation Seeking Scale (Zuckerman, Eysenck & Eysenck, 1978) that measure one's search for intense experiences in activities like parties, social drinking, and sex ($\alpha = .82$). A sample item is "I like wild parties".

Participants then completed measures of two basic motivational components of sexual behavior, that is proneness to sexual fantasy and the search for pleasure in sexual activities. Proneness to *sexual fantasy*, was assessed using seven items from the index of sexual fantasy (Hurlbert & Apt, 1993; $\alpha = .79$). A sample item is “I’m easily aroused by sexual thoughts”. Search for *sexual pleasure* as the main goal in sexual activities was assessed through four items from the Pleasure subscale of a scale measuring the various reasons humans give for having sex (Meston & Buss, 2007; $\alpha = .87$). A sample item is “I have had sex in the past because ... it feels good”.

7.2.3 Sexual Behaviors

Finally, participants were asked to report the frequency of 16 sexual behaviors. The items were taken from Farmer et al. (2009). Four items were specifically worded for heterosexual women: (1) *Kissing, petting with a male*; (2) *Mutual petting of genitals to orgasm with male*; (3) *Having genitals orally stimulated by a male*; and (4) *Giving oral stimulation to a male*. Four other items were specifically worded for heterosexual men: (5) *Kissing, petting with a female*; (6) *Mutual petting of genitals to orgasm with female*; (7) *Having genitals orally stimulated by a female*; and (8) *Giving oral stimulation to a female*. The remaining eight items concerned both genders: (9) *Masturbating alone*; (10) *Finger penetration of vagina*; (11) *Finger penetration of partner’s anus*; (12) *Mutual oral stimulation of genitals*; (13) *Vaginal intercourse (male on top)*; (14) *Vaginal intercourse (female on top)*; (15) *Vaginal intercourse (entry from behind)*; and (16) *Anal intercourse*. Participants rated the frequency of their behaviors on 7-point Likert scales (1 = *never* and 7 = *always*).

An exploratory factorial analysis, using Oblimin rotation, of the 12 (8 common, 4 gender-specific) questions suggested four clusters explaining 76% of the variance: masturbation (item 9), foreplay (items 1, 2, 3, 4, 5, 6, 7, 8, 10, and 12), vaginal intercourse (items 13, 14, and 15), and anal behaviors (items 11 and 16). We also noted that the foreplay factor was highly intercorrelated with the vaginal intercourse factor ($r = .72$), whereas intercorrelations between the other factors were weak (r s varied from .05 to .36). Therefore, for the economy of the analyses and the presentation and interpretation of results, we retained three kinds of sexual behavior variables and computed the average scores for the respective items. These were: (1) *Masturbation*—a single sexual activity, often condemned by conservative religious discourse as deviating from the goal of procreation; (2) *Common heterosexual behavior*—foreplay and vaginal intercourse items, referring to normative, conventional sexuality necessary for procreation and tolerated by religions only within marriage; and (3) *Anal sexuality*—which is often condemned as non-normative, deviating

from the goal of procreation, and being more typical in homosexual male relations.

8 Results

Means and standard deviations for all measures, as well as intercorrelations between them, are detailed in Table 1. All hypothetical mediators showed meaningful associations. Sexual pleasure, sexual fantasy, and disinhibition, were positively interrelated and were associated with higher frequency of all three sexual behaviors. Sex guilt and disgust/purity, which were interrelated and inversely related to the former constructs, were associated with less frequent sexual behaviors (only one out of the 18 correlations was nonsignificant).

TABLE 1 Means, standard deviations, and intercorrelations between all measures (Study 1: Christian tradition's sample)

	<i>M</i>	<i>SD</i>	2	3	4	5	6	7	8	9
1. Religiosity	2.14	1.49	.45***	.32***	-.18**	-.18**	-.19**	-.04	-.24***	-.05
2. Guilt	2.25	0.82		.44***	-.35***	-.54***	-.40***	-.37***	-.33***	-.16**
3. Disgust/Purity	3.55	0.70			-.20**	-.24***	-.20**	-.24***	-.25***	-.18**
4. Disinhibition	3.93	1.12				.39***	.25***	.41***	.18**	.05
5. Fantasy	5.51	0.96					.42***	.44***	.37***	.18**
6. Pleasure	6.16	1.16						.22***	.32***	.10+
7. Masturbation	4.33	1.63							.13*	.16**
8. Com. heter. beh.	4.64	1.23								.35***
9. Anal sex	1.69	0.99								

N = 276. Com. heter. beh. = Common heterosexual behavior.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 1 also includes the correlations between religiosity and the sexuality-related measures. To determine if the results held for both genders and for participants of both relationship statuses, that is single and coupled, we also computed the same correlations distinctly for each subgroup. This provided more precise and accurate information than simply controlling for gender and relationship status in partial correlations on the total sample. Results are presented in Table 2.

TABLE 2 Correlation coefficients between religiosity and sexual attitudes and behaviors, distinctly by gender and relationship status

		Guilt	Disgust/ Purity	Disinhi- bition	Sexual Fantasy	Search f. Pleasure	Mastur- bation	Common heter. beh.	Anal sex beh.
Study 1: Sample of Christian tradition									
Gender	Men	.49***	.41***	-.24**	-.22*	-.23*	-.13	-.21*	-.03
	Women	.43***	.28***	-.17*	-.19*	-.20*	-.07	-.28***	-.09
Status	In couple	.45***	.36***	-.13+	-.12	-.13+	-.03	-.21**	-.10
	Single	.46***	.27**	-.27**	-.26**	-.30**	-.10	-.29**	.06
Study 2: Sample of Muslim tradition									
Gender	Men	.71***	.61***	-.48***	-.19*	-.16	-.51***	-.14	-.15
	Women	.57***	.34***	-.47***	-.20*	.02	-.28**	-.07	-.05
Status	In couple	.62***	.43***	-.54***	-.18*	-.03	-.34***	-.03	-.04
	Single	.65***	.52***	-.31*	-.35*	-.09	-.41**	-.31*	-.35*

Note. Ns: Sample 1: men, women = 113, 163; in couple, single = 175, 101; Sample 2: men, women = 55, 115; in couple, single = 126, 43.

+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

The results deriving from the total sample showed that religiosity was related to all hypothesized mediating variables. Specifically, religiosity was positively associated with guilt, and negatively associated with disgust/purity, disinhibition, sexual fantasy, and the search for pleasure. Furthermore, religiosity was negatively associated with the reported frequency of common heterosexual behavior, whereas it was unrelated to masturbation and anal sex. Note that, when repeating these correlational analyses only for Christians, the relationships between religiosity and all sexuality-related variables were very similar to those of the entire sample, $r_s = .41$ (guilt), $.34$ (disgust/purity), $-.22$ (disinhibition), $-.15$ (sexual fantasy), $-.15$ (sexual pleasure), $-.02$ (masturbation), $-.26$ (common heterosexual behavior), and $-.01$ (anal sex). Thus, the results of Table 1 regarding religiosity seem to hold true both for believers vs. non-believers and as a function of the intensity of religiosity among believers.

Distinct correlations for each gender confirmed this pattern for both men and women. Concerning men's masturbation and women's anal sexual behavior, the negative associations between religiosity and non-normative sexuality

were stronger than in the total sample, yet still non-significant. Note that men scored higher in almost all sexuality-related mediators, i.e., non-disgust/purity, disinhibition, fantasy, search for pleasure (all $ps < .001$), and the two unconventional sexual behaviors, i.e., masturbation ($p < .001$) and anal sex ($p = .026$).

Moreover, when the correlations were carried out separately for each relationship status, overall, the pattern of results found in the total sample held for both single participants as well as those who were in a relationship. In comparison to the entire sample, these status-distinct correlations showed that the association between religiosity and low frequency of sexual behavior were somewhat stronger, although still not significant, as far as single's masturbation and couple's anal sex were concerned. Note that those in couples reported more frequent heterosexual behavior, whereas singles reported higher disinhibition and more frequent masturbation (all $ps < .001$); no differences were observed in religiosity.

Given that religiosity was related to sexual behavior and that the hypothesized mediators were related to both religiosity and sexual behavior, we subsequently conducted structural equation modeling analysis using the AMOS software, version 20 (Byrne, 2009). The model controlled for possible theoretical and empirical overlap between the five hypothesized mediators, as well as between the different kinds of sexual behavior. We tested a mediation model where the associations between religiosity and two sexual behaviors, masturbation and common heterosexual behavior, were indirect, passing through five variables: sexual guilt, disgust/purity, disinhibition, sexual fantasy, and the search for pleasure. Anal behavior was not included in the model because, in addition to the non-significant correlation with religiosity, the mean frequency of this behavior, as shown in Table 1, was extremely low. In order to evaluate the fit of the model, the following statistic indexes were used: chi-square statistic, the normed fit index (NFI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). The model (see Figure 1) showed a good fit to the data: $\chi^2(8) = 21.22, p = .007, NFI = .96, CFI = .97,$ and $RMSEA = .078,$ with 90% CI = [0.04, 0.12]. The indirect effect for mainstream sex was $-0.09, p = .006,$ with 95% CI [-0.20, -0.05], and for masturbation was $-0.16, p = .004,$ with 95% CI [-0.28, -0.11]. Precisely, religiosity predicted all hypothesized inhibitory sexual variables: high sexual guilt and disgust/purity, as well as low disinhibition, proneness to sexual fantasy, and search for sexual pleasure. In turn, guilt, low disinhibition, and low fantasy—but not disgust and search for pleasure—predicted a low frequency of masturbation, whereas low sexual fantasy and low search for pleasure predicted a low frequency of common heterosexual behavior.

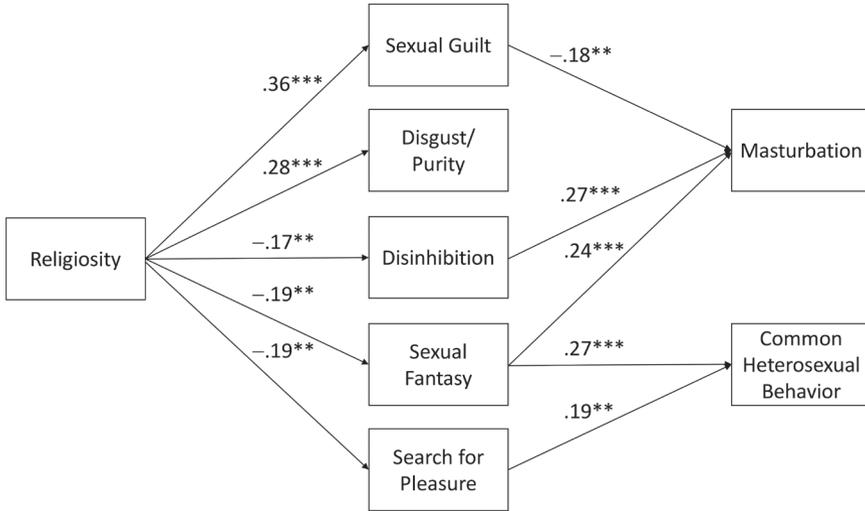


FIGURE 1 Religiosity as predicting low frequency of sexual behaviors through sexuality-related affects and cognitions, in Study 1, with participants of Christian tradition. Numbers on paths represent standardized coefficients.

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

9 Discussion

In a rather secular, in terms of low mean religiosity, but still balanced sample of about half Catholics and half non-believers from very secular Western European countries (Belgium and France), personal religiosity was found, in line with our expectations, to be related to low frequency of common heterosexual behavior and to be negatively associated with affects and thoughts facilitating that behavior (disinhibition, search for sexual pleasure, and sexual fantasy) while positively associated with its undermining moral emotions (sexual guilt and disgust/purity). Remarkably, all the above relationships were present among both men and women and among both single and coupled participants. Finally, the association between religiosity and low common heterosexual behavior was indeed partly mediated by decreased sexual aspirations at the cognitive (fantasy) and the affective (search for pleasure) levels.

The fact that religiosity, in bivariate correlations, was negatively related only to common heterosexual behavior but not to masturbation or anal sex could simply be due to the low predictive capacity of the one-item indicator of masturbation and the very low reported frequency of anal sex. Nevertheless, religiosity also indirectly predicted a low frequency of masturbation through

high inhibition, high sexual guilt, and low sexual fantasy. Finally, though all five hypothesized mediators were meaningfully related to both sexuality and religiosity, disgust/purity failed to directly or indirectly mediate religiosity's effect on decreased sexual behaviors. Thus, Study 2 gives the opportunity for a more thorough evaluation of whether this null finding was due to chance or not.

10 Study 2

In Study 2, we aimed to replicate and cross-culturally/religiously validate and extend the results of Study 1 obtained from individuals of Christian tradition, by asking the same research questions to a sample of participants of Muslim tradition. For reasons we detailed in the Introduction, this study is of additional and unique intellectual interest. Given the commonalities between monotheisms regarding sexual morality, one should expect similar findings between people of Christian tradition and people of Muslim tradition. However, based on several specifics in Islamic teachings, specifically in the high value placed on intra-marital fertility, differences may exist between single and non-single Muslim participants or between Muslim and Christian participants who are in a relationship.

11 Method

11.1 Participants

Participants were 170 adults ranging in age from 18 to 53 years old ($M = 25.31$, $SD = 6.06$; 71% women), recruited on social networks (French-speaking), and having parents of North African and Turkish origin. Participants were mostly from Belgium or France (81%) and North Africa (13%), with the remaining participants coming from other countries (6%). In order to be sure of participants' origins, we asked about the origin of their father, which was North Africa (76%; mostly Morocco), Belgium or France (9%), Middle-East (7%), and other (8%), as well as the origin of their mother, which was North Africa (68%), Belgium or France (16%), Middle-East (7%), and other (9%). Participants mostly self-identified as Muslims (74%), whereas 26% self-identified as non-believers. Seventy-five percent of the participants reported being in a relationship. The original sample was larger (280) but, given the purpose of the study, we excluded 84 participants from the analyses who reported being a virgin, 16 participants who reported being gay or lesbian, and 10 participants for which there was no evidence of Muslim ethnic/religious background on the basis of the parents' country of birth and/or reported religious affiliation other than Muslim.

11.2 Measures

We measured religiosity, sexual behaviors, and hypothesized mediators, that is sexual guilt, disgust/purity, disinhibition, sexual fantasy, and search for sexual pleasure, as in Study 1. The only difference was that, to facilitate the analyses, we did not distinguish sexual behavior items referring to men from those referring to women, but rather replaced “men” or “women” by “partner”. As in Study 1, we grouped the scores of the various items of sexual behaviors under three types: masturbation, common heterosexual behavior, and anal sex. The intercorrelation between foreplay and vaginal intercourse was again very high ($r = .60$), compared to all other intercorrelations, which varied from .17 to .36. Reliabilities for all measures were satisfactory, with Cronbach’s alphas ranging from .70 to .88.

12 Results

Means, standard deviations, and intercorrelations for all measures are detailed in Table 3. As in Study 1, the intercorrelations between the hypothesized mediators as well as their correlations with the sexual behaviors were significant and in the meaningful direction—only two out of the 36 correlations were non-significant.

TABLE 3 Means, standard deviations, and inter-correlations between all measures (Study 2: Muslim tradition’s sample)

	<i>M</i>	<i>SD</i>	2	3	4	5	6	7	8	9
1. Religiosity	5.16	2.01	.62***	.45***	-.49***	-.21**	-.05	-.36***	-.11	-.12
2. Guilt	3.48	1.37		.58***	-.65***	-.46***	-.26**	-.47***	-.27***	-.30***
3. Disgust/Purity	4.39	1.02			-.33***	-.23**	-.06	-.32***	-.12	-.15*
4. Disinhibition	2.92	1.35				.48***	.33***	.54***	.29***	.31***
5. Fantasy	3.95	1.09					.39***	.49***	.42***	.21**
6. Pleasure	5.35	1.59						.23**	.38***	.26**
7. Masturbation	3.52	1.94							.23**	.36***
8. Com. heter. beh.	4.88	1.19								.32***
9. Anal sex	1.66	1.20								

N = 170. Com. heter. beh. = Common heterosexual behavior.

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

For exploratory purposes, we compared the means of this study's sample (majority Muslim) with the same means from the participants of Study 1 (predominantly Christian). Study 2's sample was higher in religiosity, sexual guilt, and disgust/purity, and lower in all other sexuality-fueling affects and cognitions (disinhibition, sexual fantasy, and search for pleasure) as well as the frequency of masturbation, $F_{s(1,440)} > 5.69$, all p s $< .001$, except for disinhibition, $p = .004$. No differences were found between the two groups with regard to the frequency of foreplay or anal intercourse, but the Muslim tradition group reported more frequent vaginal intercourse than the Catholic tradition group, $F(1,440) = 2.25$, $p = .025$.

Correlations between religiosity and all the sexuality-related measures, in the overall sample, are also detailed in Table 3. As in Study 1, religiosity was positively related to sexual guilt and disgust/purity, and negatively related to disinhibition and sexual fantasy. However, religiosity was unrelated to the search for sexual pleasure. Moreover, like in Study 1, religiosity had an overall negative relationship with the frequency of sexual behaviors, but, unlike Study 1, the significant effect was for masturbation—and not for common heterosexual behavior. Note that repeating the same correlational analyses only for those who self-identified as Muslims provided overall similar effects for most of the variables, r s = .48 (guilt), -.46 (disinhibition), -.03 (sexual pleasure), -.17 (masturbation), .01 (common heterosexual behavior), and -.12 (anal sex). The only effects that were markedly weaker or disappeared were those related to disgust/purity (.14) and sexual fantasy (-.08).

To better examine whether the above pattern of results held for both men and women, and for both single and coupled persons, we computed distinct correlations by subgroup (see Table 2), rather than trusting partial correlations controlling for gender or relationship status. (Note that men reported higher frequencies of all sexual behaviors—and not only for the unconventional behavior, as in Study 1; and higher disinhibition, sexual fantasy, and search for pleasure—but the two genders did not differ in guilt and disgust/purity.) All of the associations found in the overall sample, between religiosity and all five hypothesized sexual mediations, as well as masturbation, were significant for both men and women and for both single and coupled persons. Furthermore, the remaining associations between religiosity and common heterosexual and anal sexual behaviors were negative across the four groups, and were strongest and significant among the single participants. Note also that, similarly to Study 1, compared to singles, coupled participants reported a higher frequency of foreplay and, at a marginally significant level, vaginal intercourse, whereas singles reported a higher frequency of masturbation and greater disinhibition; no differences in religiosity were observed.

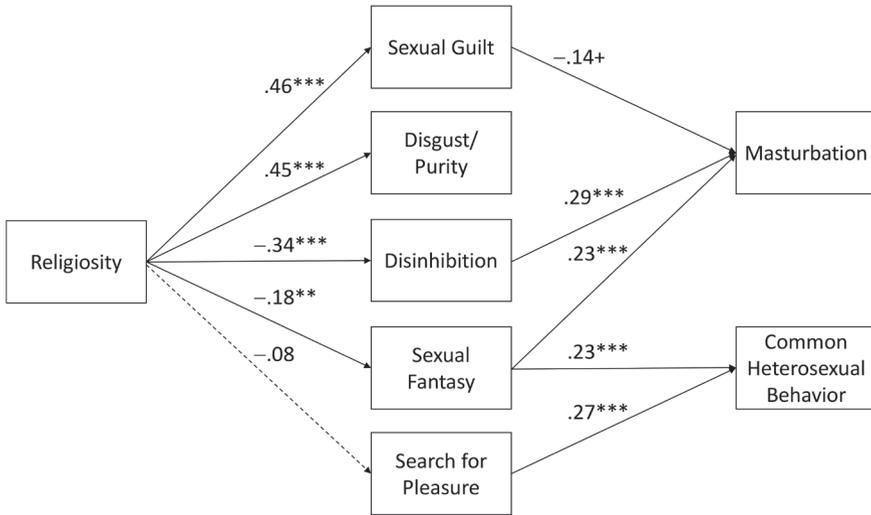


FIGURE 2 Religiosity as predicting low frequency of sexual behaviors through sexuality-related affects and cognitions, in Study 2, with participants of Muslim tradition. Numbers on paths represent standardized coefficients. + $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

As in Study 1, we tested a mediation model, with the five hypothesized variables as mediators (guilt, disgust/purity, disinhibition, sexual fantasy, and search for sexual pleasure) and the two behaviors, masturbation and common heterosexual behavior, as outcomes (see Figure 2). Similar to Study 1, the mean frequency of anal behavior was extremely low, compared to the other behaviors. The model showed a good fit to the data: $\chi^2(8) = 5.39, p = .715, NFI = .98, CFI = 1$, and $RMSEA = .000$, with 90% CI = [0.00, 0.07]. The indirect effect for mainstream sex was $-0.05, p = .077$, with 95% CI [-0.11, 0.00] and for masturbation was $-0.17, p = .016$, with 95% CI [-0.26, -0.10]. Precisely, religiosity predicted sexual guilt, disgust/purity, low disinhibition, and a low proneness for sexual fantasy, but not a significantly low search for sexual pleasure. In turn, guilt, low disinhibition, and low fantasy, but not disgust and search for pleasure, predicted low masturbation frequency; low sexual fantasy and search for pleasure predicted a low frequency of common heterosexual behavior.

13 Discussion

Study 2, carried out on a sample of Muslim tradition, replicated most of the findings of Study 1 (sample of Christian tradition). All five hypothesized

mediators were related to the frequency of all three kinds of sexual behavior—only one of the 15 correlations was nonsignificant. Religiosity was related to four out of the five hypothesized mediators, i.e., high guilt and disgust/purity and low disinhibition and sexual fantasy. Moreover, religiosity indirectly predicted (in mediations) a low frequency of (1) common heterosexual behavior, through decreased sexual fantasy and search for sexual pleasure, and (2) masturbation, through increased sexual guilt and decreased disinhibition and sexual fantasy (there was even a direct association between religiosity and low masturbation). The above findings held for both genders and for both relationship statuses. These similarities between the two studies underline the fact that religion's suspicion of sexuality is not restricted to Christianity, whose theology is perceived as having amplified sexual guilt, but extends to the second major world religion, Islam. The underlying psychological mechanisms also seem to be the same.

Study 2, however, also provided notable differences in results compared to Study 1. Religiosity was not directly related to a low search for sexual pleasure and was associated with decreased heterosexual behavior (common and anal) only among single people, but not among people in relationships, which in the case of this predominantly Muslim sample meant mostly married. These findings can be interpreted as pointing to the fact that Islam is more tolerant of, and perhaps even places value on, intramarital sexuality, and does so due to the strong emphasis placed on fertility. As the results of the present study suggest, even if Muslim religiosity sustains emotions, affects, and thoughts undermining sexuality (guilt, disgust/purity, inhibition, and low sexual fantasy), it (1) does not inhibit the search for pleasure, i.e., the most basic motive to have sex and thus procreate, and (2) does not inhibit fertility-oriented heterosexual behavior among married partners, but (3) does inhibit masturbation, i.e., a prototype of sexual behavior that does not contribute to procreation, and (4) inhibits heterosexual behavior among single people, i.e., premarital and extra-marital, non fertility-oriented, sex.

Finally, the mean differences between the two samples, with the Muslim sample being much higher than the Catholic sample on religiosity—but still with a non-negligible variability—and significantly lower than the Catholic sample in affects, emotions, and cognition favoring sex, as well as on the frequency of masturbation (but, again, not on the frequency of common heterosexual behavior) are in line with the general pattern coming from large international data. The more religious a society is, the more its people are conservative and in favor of a restrictive socio-sexuality (e.g., Doeblner, 2015). Notably, Muslim individuals and societies have the highest fertility rates (Pew Research Center, 2017).

14 General Discussion

Consistently across these two studies we found that, across religious traditions (Christianity and Islam), genders, and relationship statuses, people who were more religious, compared those who were less or nonreligious, were characterized by stronger feelings of sexual guilt, higher sensitivity to disgust and attachment to purity, higher physiology-based inhibition, and a lower cognitive propensity for sexual fantasy. These religious tendencies in moral emotions, affects, and thoughts, in turn, either directly or indirectly impacted sexual behavior, i.e., predicted less frequent common heterosexual behavior and/or masturbation. The effects were not weak, but typically moderate, varying across outcomes from $> .20$ to almost $.50$. Overall, the findings indicate that the conflict between religion and sexuality is not limited to a historical past, but still influences people's sexual lives, in terms of affects, moral emotions, cognitions, and behaviors. This conflict colors even normative and "everyday" sexuality (masturbation and common heterosexual behavior), and is not limited to liberal, unconventional, non-normative sexual behaviors viewed with social, moral, and/or explicit religious suspicion (e.g., premarital or extramarital sex, homosexuality, or multiple sexual relations). Also, whereas the present findings cannot be generalized to all world religions, it is of interest to note that Christians and Muslims together represent about 55% of the world population (Pew Research Center, 2017).

Moreover, these effects were found even in contexts, like that of Study 1, where traditional theological discourse, at least Christian, has been progressively replaced by a more positive consideration and valorization of the body, body-related emotions, sexual pleasure, and sexual behavior, at least in the context of a loving, faithful, heterosexual relationship, preferably within marriage. Interestingly, analyses of large international data suggest that in modern and secular societies, compared to traditional ones, restrictive socio-sexuality is attenuated on average even among religionists, but the associations between individual religiosity and restrictive socio-sexuality are actually stronger due to the greater variability of moral attitudes within these secular societies (Saroglou, 2019, for review).

From a cross-cultural/religious psychological perspective, an interesting pattern of differences was found between the two samples. Unlike for the Christian tradition sample in Study 1, in the Muslim tradition sample of Study 2, religiosity was not negatively related to sexual pleasure and did not directly predict decreased heterosexual behavior among married participants—but did so only among those who were single. Inversely, religiosity's role in decreasing the reported frequency of masturbation was clearer in the Muslim

tradition sample, compared to the Christian tradition sample. These findings denote the consequences of Islam's much stronger emphasis on the ideal of fertility (Pew Research Center, 2017) and thus the acceptance of sexual pleasure to facilitate intra-marital, procreation oriented, heterosexual behavior. However, in Western Christianity, sexuality may be seen with a more generalized suspicion, possibly due to the moral questions it raises regarding its focus on hedonism over asceticism and the self or couple over work- and society-oriented concerns. Interestingly, across the world, contemporary Catholics, compared to other Christians or Muslims, seem more tolerant—or less intolerant—of homosexuality (e.g., Malka, 2014) and, as the present work suggests, of masturbation. The moral priority in a Catholic culture seems to be placed on the concern of whether satisfying sexual interests may harm the broader society and other domains of human activity, rather than the concern for fertility regulation.

Across the two studies, the only unexpected null findings were that the frequency of anal behavior seemed unaffected by religiosity, except among single individuals of Muslim tradition, and that sensitivity to disgust/purity failed to play an explanatory role in the association between religiosity and low sexual behavior, though such sensitivity was related to both religiosity and infrequent sexual behavior. We do not see theoretical reasons to change our expectations regarding these two constructs. First, when aggregating the two samples (the low mean scores and low variability of the frequency of anal behavior may have contributed to a Type II error), anal behavior was significantly negatively related to religiosity: $r = -.14$, $p = .004$. Second, as far as disgust/purity is concerned, it may be that the measure used, and the items selected, were too conceptually broad, referring to various dimensions of sensitivity to disgust that included pathogen and moral disgust, and thus did not primarily focus on the sexual dimension of disgust. Future research should investigate this issue.

The observed similarity across genders on religion's role with regard to sexual affects, emotions, thoughts, and behaviors deserves comment. Though the men in both studies confirmed the stereotype of men being more interested and involved in sexuality than women, religious men, similarly to women, tended to report infrequent sexual behavior and restrictive sexual affects, emotions, and thoughts. Thus, in line with findings from large international data (Schmitt & Fuller, 2015), these results indicate that religion's discomfort with sexuality could be universal, resulting from deeply imbedded psychological processes rather than being solely a result of patriarchal beliefs preferentially restricting women's socio-sexuality. If anything, the negative associations between religiosity and sexual outcomes were consistently stronger, sometimes

double in size, for men, compared to women (in 13 out of 16 cases; see Table 2). If this is not by chance, it could be due to the higher variability of sexuality-related attitudes and behavior among men than women. It may also be that, at least in secularized contexts (because across the world, the effects are larger for women; Schmitt & Fuller, 2015), men show higher variability on religious and moral attitudes compared to women, with men clearly “swimming against the stream” when they are religious.

Beyond its interest, this work also presents some limitations. First, all measures, in particular sexual behavior, were self-reported. It could thus be that religious respondents conform more to what is religiously normative, i.e., restrictive socio-sexuality, rather than accurately reporting their sexual behavior. Nevertheless, although discrepancies between self-reported and actual behavior cannot be fully excluded (e.g., Grubbs, Exline, Pargament, Hook, & Carlisle, 2015; Hook et al., 2015), there is evidence that religion's discomfort with sexuality goes beyond self-reports. As detailed in the Introduction, this evidence comes from longitudinal studies and experimental work. Second, the present results may be different, very likely in effect size rather than the direction of the associations, if one moves from Christianity and Islam to other religions, like Judaism or Buddhism, where, all else being equal, there seems to exist more tolerance for some sexuality- and family-related moral issues (Norris & Inglehart, 2004; see also Saroglou, 2019, for review). Third, the hypothesized mediators explained only part of religiosity's effects. Further research should identify and investigate additional hypothetical explanatory variables. Finally, we do not deny the possibility that some specific religious forms and expressions of faith and spirituality, such as the sanctification of sexuality (Hernandez et al., 2013) or a religion-as-quest orientation (Rowatt & Schmitt, 2003), may not imply restrictive or inhibitory forms of sexual life.

Beyond these limitations, the present works sheds light on the depth of religiosity's role on sexuality, a role that seems embedded on a series of emotions, affects, and thoughts. Though this issue can stand on its own in terms of its theoretical and societal importance for understanding individuals' and groups' sexuality and the related moral differences and conflicts in contemporary societies, it also has non-negligible health implications. Sexual life in general, and in particular among couples, contributes to one's well-being and happiness and to partners' and spouses' global and sexual satisfaction, as well as to one's children's well-being. Thus, it is of critical importance to be aware of the implications that religiosity has on sexual life, from thoughts and affects to desires and behaviors.

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