

Does Female Promiscuity Increase Religious Beliefs? Testing the Male Control

Theory versus the Female Control Theory

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DOES FEMALE PROMISCUITY INCREASE RELIGIOUS BELIEFS? TESTING THE
MALE CONTROL THEORY VERSUS THE FEMALE CONTROL THEORY

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Abstract

Most psychological articles examining religion treat this construct as either an independent or controlled variable. Few studies have addressed the possibility that religiosity may shift as a function of environmental cues (i.e., that religiosity may be studied as a dependent variable). Among these studies, even fewer have looked into how religion may be a viable means to suppressing the sexuality of others, particularly that of females. My work aims to test two theories as to which sex stifles female sexual behavior the most. I examined whether reading about a highly versus a less promiscuous target affects participants' religiosity and whether the sex of the target and the participant interact in this effect. A series of ANCOVAs revealed that, while promiscuity levels did not seem to affect religiosity, target and participant sex did interact, with men reporting less religiosity when presented with same-sex targets but females not varying significantly as a result of the target's sex. Results support the existing research that religiosity is a more flexible construct than previously thought.

Introduction

Because the end goal of evolution is to pass one's genes onto future generations, humans have evolved a plethora of mating strategies to increase their reproductive fitness (Gangestad & Simpson, 2000). Further, others' sexual behaviors may impact one's own reproductive success, and, as a result, several of these mating strategies do not necessarily focus on one's own sexual behavior, but on the behavior of others, be it members of the same sex (i.e., intrasexual selection) or members of the opposite sex (i.e., intersexual selection). Given that "few things lie closer to the engine of the evolutionary process than sexual behavior" (Buss, 2002) it is no surprise that humans show a general interest in monitoring the sexual behavior of others and that even the earliest civilizations sought to impose injunctions on sexual morality (Berkowitz, 2012).

Many early legal codes not only attempted to regulate sexual conduct, but also focused on women when dictating the law. This sometimes translated in women suffering more ruthless punishments than men (Reynolds, 1914). For instance, among the Babylonians, adultery was solely the crime of the wife, and, if caught, she and her paramour were to be strangled together. The nearest approach to punishment for an adulterous husband, on the other hand, was that the wife was allowed to take her marriage portion and return to her parental home. Even in cases where men were severely punished for breaking a law concerning sex, the austerity of such measures was typically contingent on the status of the woman involved.

Early civilizations around the Mediterranean, the Far East, the Andes and Mexico, Northern Europe, and Africa coincided in defining adultery in terms of the woman's marital

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status while the status of the adulterous man was irrelevant (Berkowitz, 2012; Wilson & Daly, 2002). When it came to rape, a man who sexually assaulted a betrothed virgin was put to death, while a man who raped a girl not yet promised in marriage simply owed the father compensation for the lost chance at marrying the daughter off at high prices. A father could sue the rapist, force him to marry the daughter, or sell her to another prospect (Berkowitz, 2012). Such laws exhibiting sexual male proprietariness (i.e., laying a claim over a particular woman and advertising and exercising the intention of defending this “property”) were and are still common across some cultures (Wilson & Daly, 2002). Thus, it seems that not only are humans interested in the sexual behavior of others, but that we are especially interested in the sexual actions of females.

While sexual conduct is often a target of judicial law, other social institutions, such as religious groups, also attempt to control sexual behavior. Despite the great variability across today’s world religions, some near-universal features in their regulation of sociosexuality can be found. For instance, religion has tried to regulate aspects such as when conception should take place, the age at which intercourse should begin, how many sexual partners an individual is allowed to have, the moral standing of premarital sex, and so on (Schmitt & Fuller, 2015). Additionally, Weeden, Cohen, and Kenrick (2008) argue that religious groups tend to support a high-fertility, marriage-centered, low-promiscuity, and long-term sexual strategy. This approach results in individuals who favor long-term mating strategies having increased incentives to affiliate to religious groups. Thus, the proposed study argues that when males and females have motives to try and regulate the sexual behavior of others, they might turn to religion as a means to suppress sexuality.

Advantages of Female Sexual Suppression

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The Male Control Theory

Two theories may account for the suppression of female sexuality (Baumeister & Twenge, 2002; Baumeister & Vohs, 2004; Baumeister & Mendoza, 2011). The male control theory (MCT) states that it is in men's interest to suppress female sexuality, particularly that of their wives. This strategy would lead to higher paternity certainty given that males who pursue long-term mating allocate resources such as food and protection toward their mates and offspring, sacrificing time that could otherwise be spent in search of other mating opportunities (Buss & Schmitt, 1993). Given this high investment, cuckoldry would be fatal because a male would be spending resources on a child that is not genetically related to him. As a result, a male may feel tempted to control his partner's sexuality to decrease the chances of paternal uncertainty.

It is important to note that the MCT emphasizes the male mate as the primary influence in suppressing *his mate's* sexuality. Stifling the sexual behavior of other women would be of little to no interest for men who already have long-term mates. Meanwhile, an individual male pursuing a short-term mating strategy would have no reason to wish women to control their sexual appetite. Instead, because he is not investing in the females he copulates with or in any offspring that might result from such encounters, he should prefer females to have higher sexual desires, thus making sex more easily available and increasing his reproductive success (Baumeister & Twenge, 2002).

The Female Control Theory

Unlike the MCT, the female control theory (FCT) states that women play the bigger role in suppressing other women's sexuality, regardless of whether they have a permanent

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mate (Baumeister & Twenge, 2002; Baumeister & Vohs, 2004; Baumesiter & Mendoza, 2011). According to this theory, females cooperate through an unconscious agreement to stifle each other's sexuality and reap the benefits of such actions. Because sex is not only pleasurable, but also essential for reproduction during most of our evolutionary history (i.e., before technologies such as artificial insemination), it is an incredibly valuable resource that men seek and women control. Keeping the price of sex high works to women's advantage as, the higher the price, the more inducements men will have to provide to persuade females of having sex.

In this manner, sex can be considered a market in which males represent the demand and females the supply. Women who offer sex easily jeopardize this system by lowering the value of sex and are consequently viewed as threats that must be stifled. Additionally, not only does suppressing female sexuality keep the value of sex high forcing males to offer appetitive resources, but it also reduces the risk of losing one's mate to another woman. Because men tend to prefer women with high reproductive value (Buss & Schmitt, 1993), men might be tempted to leave their mates if they find a more sexually appealing partner. Similarly, an individual female might also benefit from stifling her own sexuality since any indications of promiscuity may result in her mate withdrawing resources necessary for survival due to his fear of being cuckolded (Price, Pound & Scott, 2014; Wilson & Daly, 2002). Unlike the MCT, the FCT states that both single and committed women benefit from stifling female sexuality.

Evidence of Female Sexual Suppression

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The main argument behind the MCT is that legal codes were written by males in patriarchal societies, and that patriarchy and sex role socialization are the underlying factors behind a greater concern for female sexuality. Males use their economic and political power to stifle female sexuality and increase paternal certainty. Supporting this argument, Reiss (1986, as cited in Baumeister & Twenge, 2002) found a positive correlation between indexes of greater male power and suppression of female sexuality across cultures; however, one must be careful to assume that these findings uniquely support the MCT. Baumeister and Twenge (2002) offer an alternative explanation; when women lack political and economic power, sex becomes a crucial means to gain access to resources, and thus suppressing female sexuality becomes more important compared to when women have alternative sources of power.

In line with this reasoning, Baumeister and Mendoza (2011) hypothesized that sexual norms and practices would be less restrictive in countries with higher gender equality. Across 37 nations, higher gender equality was negatively correlated to abstinence promotion and age of first sex, and positively correlated to casual sex and number of sexual partners. However, as previously stated, both the MCT and FCT could account for these findings, and thus correlations between gender equality and sexual behavior are not sufficient evidence for either theory.

Following similar reasoning with regards to gender equality, if the patriarchy and sex role socialization were behind gender differences in sexual behavior and attitudes, then the MCT would predict smaller gender differences among cultures with higher equality because, in such cultures, men would no longer possess significantly more power than females, and women would be able to break the shackles of oppression and behave as

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sexually permissive as they wish. Schmitt (2015) found the exact opposite. For instance, sex differences in the sociosexuality item “I can imagine myself being comfortable and enjoying casual sex with different partners” were largest across the most egalitarian nations (i.e., Scandinavian countries), with men scoring significantly higher than women. This evidence suggests that, across cultures, reducing patriarchy does not make sex differences disappear but rather makes them larger.

Another phenomenon studied to compare the MCT and FCT is *operational sex ratio*; the proportion of sexually competing males to sexually competing females (Baumeister & Twenge, 2002). According to the MCT, if males are the minority then the sex market would have a lower demand (represented by males) than supply (represented by females), giving men the power over the market. Men could then use this power to enforce a greater suppression of female sexuality. On the other hand, according to the FCT, too many women would equal a high surplus of sexual opportunities, which would lower the value of sex and force women to engage in more permissive behaviors because an individual woman who does not offer her man the sexual satisfaction he wants can be easily replaced. Research by Guttentag and Secord (1983) support the FCT; throughout history, there has been more sexual activity when men are in the minority, whereas when females are scarce, permissive sexual behaviors such as premarital and extramarital sex are rare.

Finally, one of the most common ways to examine both control theories is by studying the sexual double standard (SDS). The MCT does receive some support in this area. For instance, a meta-analysis on gender differences (Petersen & Hyde, 2010) found that male participants reported higher endorsement of the sexual double standard than did female participants. Similarly, Rudman, Fetterolf, and Sanchez (2016) found that men

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showed more favorable attitudes towards the SDS and that the gender gap was mediated by hostile sexism but not benevolent sexism. Men also endorsed the SDS to the extent that they believed it existed, whereas women showed the reverse. In terms of encouraging friends to have casual sex, men encouraged their male friends the most and discouraged their female relatives the most. Going against the FCT, women encouraged their female friends more than they did their male friends. These results seem to support the MCT; however, there are a few caveats that may have led to these findings.

The methodology used by Rudman et al. (2016) may be eliciting a confirmation bias. As explained by Marks and Fraley (2005), while the SDS seems ubiquitous in our environment partly because of the attention it receives by media outlets, empirical research does not necessarily show that people evaluate sexually active men and women differently. Whether an individual believes the SDS is present in society does not necessarily mean that the individual endorses the SDS. Attitudes about sexual behavior differ from evaluations in that the first relate to the perceived norms within a culture regarding sex and the appropriateness of certain behaviors, whereas the latter involves actual judgments made about people who engage in these particular sexual acts. Thus, attitudes may be independent of the way people actually evaluate one another, and not differentiating between both in SDS research can be problematic.

While Rudman et al. (2016) did measure both beliefs and attitudes (although not evaluations), the way they phrased their questions may have elicited demand characteristics. For instance, the SDS belief item “The sexual double standard, whereby men have more freedom than women to engage in casual sex with many partners, is still true today” may prime participants to answer in manners that match what they believe is

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the norm. Similarly, the attitudes item “In my opinion, the sexual double standard is good and should be maintained” leads the participant to assume that a SDS exists in the first place, which may not be the case. In fact, when Marks and Fraley (2005) removed any SDS language and simply asked participants to read vignettes about a target person and rate said target across several traits with regards to values, peer popularity, power/success, and intelligence, female targets were not derogated any more than male targets were as a function of sexual partners, and the few domains in which small differences manifested themselves accounted for less than 1% of the variance in target perception. Overall, Marks and Fraley (2005) found virtually no evidence for a SDS.

Research on the SDS has yielded a plethora of different results. For instance, Sprecher and Hatfield (1996) found that men endorsed the SDS for women and men who were dating casually but not for women and men dating seriously, and while American men generally endorsed the SDS more than women, this was not the case for Russian and Japanese samples. That the SDS would be embraced for casual dating but not for serious dating directly contradicts the MCT as the theory argues men with long-term mates would be more interested in stifling the sexuality of their partners while men pursuing casual, short-term mating should prefer females to be more sexually permissive. Alternatively and in line with the FCT, Milhausen and Herold (1999) found that while most participants believed a SDS existed, 42% of participants believed *women* judged other women with multiple partners more harshly, and results showed that women were more likely to discourage a female friend from dating a man with multiple past sexual partners. While SDS research has yielded conflicting evidence (see Crawford & Popp, 2003 for a more

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thorough review), even studies where men seem to endorse the SDS more than women fail to fully support the MCT (Sprecher and Hatfield, 1996).

Overall, more research seems to support the FCT suggesting that women promoting female sexual restraint (see Baumeister & Twenge, 2002), and as such, the FCT is the focus of this paper.

Religion and Sexual Behavior

Religiosity and Sexual Experiences

That religiosity and sociosexuality are related is an understatement. To name a few studies that have found links between religious affiliation and sociosexuality, Weeden et al. (2008) found that sexual behaviors were better predictors of religious attendance than were personality traits. Rowatt and Schmitt (2003) found that religious orientation was correlated to a variety of sexual dimensions of the self. Intrinsic religiosity, for instance, was negatively correlated with the number of sex partners desired, openness to having sex with a desirable person known for a shorter time, and mate poaching. Extrinsic religiosity was correlated with less sexual restraint, more relationship exclusivity, unrestricted sociosexuality, and mate poaching. While we cannot conclude that religion leads to more restricted sexuality because a) the study was only correlational, and b) people with an extrinsic religious orientation were somewhat less restricted, both religious orientations did account for unique variance in sexual dimensions after controlling for variables such as gender, social desirability, and personality traits. Continuing with studies on religion and sexual experiences, Schmitt and Fuller (2015) studied 10 major world regions (i.e., North America, South America, Western Europe, Eastern Europe, Southern Europe, Middle East,

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Africa, Oceania, South/Southeast Asia, and East Asia) and found that unrestricted sociosexuality and short-term mating interests were inversely associated with religiosity across nearly all world religions (with South/Southeast Asia, and East Asia being the exceptions) and that these links were typically stronger among women than among men.

In terms of FCT versus MCT, I have discussed that stifling female sexuality may prove beneficial for members of both sexes. In such scenarios, any group that enforces behaviors such as male proprietariness or condemns sexual permissiveness can effectively manipulate the sexual behavior of its members. Similarly, in the degree to which a religion emphasizes the importance of female sexual suppression and ensures its compliance, its effectiveness in manipulating female sexual conduct will increase, thus rendering religion more useful (Buss, 2002). For instance, Strassman, Kurapati, Hug, Burke, Gillespie, Karafet, and Hammer (2012) found that religions that were stricter in forcing females to signal menstruation among the Dogon community in Mali had higher chances of paternity certainty. Similarly, when it comes to alternative sources of sexual gratification such as masturbation and pornography that may lower the value of sex, religious groups have led part of the fight against these outlets, and studies suggest a negative correlation between religiosity and pornography use due perhaps to higher cognitive dissonance in religious individuals who engage in such shunned sexual behaviors (Nelson, Padilla-Walker, & Carroll, 2010, Patterson & Price 2012). That women tend to be more religious than men could also potentially support the FCT insofar religion emphasizes sexual suppression.

All studies mentioned to this point focus on the relationship between religion and sexual behavior with the assumption that one's religion will typically have consequences on one's sexual behavior and that religion is a more-or-less stable trait. Little research has

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considered the possibility that individuals may shift in religiosity as a result of contextual cues. Because religion is such a complex phenomenon that has been partially shaped by a variety of evolved mechanisms related to domains from large-scale social cooperation to alloparental care, to monogamous reproductive strategies, any environmental factors that activate these mechanisms may collaterally affect religiosity. The following section explores this possibility further.

Religiosity as Contingent on Environmental Factors

Research commonly focuses on religiosity as an independent variable used to influence other dependent variables (e.g., altruism, out-group biases, attitudes towards pornography, and so on). By contrast, some studies offer insight to religiosity as a dependent variable in which another independent variable is used to alter not only religious beliefs, but also religious attitudes and behaviors. Many of these are not exclusive to religion and mating behavior. For instance, exposing participants to secular arguments has been found to reduce both implicit and explicit religious beliefs (Shariff, Cohen, & Norenzayan, 2008). Similarly, narrative virtual gaming decreases propensity for self-reported spiritual and religious experiences compared to single text based narratives by offering an absorbing “escape” narrative with little cognitive effort (Burriss & Dow, 2015). Social connectedness also seems to affect religiosity, as participants who were made to feel excluded from a social group had an increased perceived agency in gadgets and gods (Epley, Akalis, Waytz & Cacioppo, 2008). Finally, the assumption of contractive body postures led to more agreement with conventional religious beliefs than did the assumption of expansive postures. (Fuller & Montgomery, 2015).

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When it comes to religion as a variable contingent on mating factors, Li, Cohen, Weeden, and Kenrick (2010) found that both males and females reported higher religiosity when confronted with profiles of same-sex attractive individuals as opposed to profiles of opposite-sex individuals. When competitors are salient, participants may perceive higher levels of intrasexual competition and will thus turn to methods and groups that favor imposing restrictions on others' sexual conduct, with religious groups being an example of such. Similarly, Durante, Rae, and Griskevicius (2013) found that single women reported less religiosity during ovulation than single women outside their ovulating phase, whereas women in committed relationships who were ovulating at the time of the study were more religious than committed women not ovulating at the time of the study.

It is worthwhile to note that, although Li et al. (2010) and Durante et al. (2013) provided supporting evidence for religion being contingent on environmental factors, neither seemed to entirely support the female control theory. Li et al. (2010) did predict that the effect of salient competitors would be stronger among women than among men, yet data revealed no interaction between gender and profile condition. The authors were surprised when results showed that men, similar to women, were more religious when seeing attractive men and less religious when seeing attractive women. They concluded that any change in religiosity following exposure to mating markets with different characteristics would suggest the potential of religiosity as a mating strategy. Further, it is hard to predict what the FCT would have hypothesized in the Durante et al. (2013) study. Single ovulating females may be more likely to pursue a short-term mating strategy, which comes into conflict with the low-promiscuity mentality of most religious groups. Similarly, because any indications of female promiscuity may result in a male mate withdrawing

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resources for fear of cuckoldry, an individual female in a committed relationship may show increased religiosity as a means to assure her mate of her long-term commitment.

The Reproductive Religiosity Model

Weeden et al. (2008) argue that religious attendance supports a long-term sexual strategy (at least in the contemporary United States). Religious groups enforce this strategy through the provision of support to members who abide by the moral norms dictated by the group and exclusion of members who fail to follow them. As a result, individuals favoring long-term mating strategies will have increased incentives to affiliate with religious groups, whereas those pursuing alternate strategies will have decreased incentives. This Reproductive Religiosity Model (RRM) suggests that individuals adapt their levels of religious participation throughout their lives so that these match their ongoing life-history plans and outcomes. According to the authors, this model could help explain the difference in religiosity between younger and older adults. Young adults, particularly young males, may abandon religious participation in the years before they settle down because they are pursuing short-term mating. Submitting to religion and religious groups that try to enforce long-term strategies and monogamy would present a cost (i.e., foregoing extra-pair mating opportunities). Elderly people on the other hand have little to lose by submitting themselves to prohibitions against promiscuity. If anything, it might be beneficial to belong to a community that shuns sexual permissiveness because it decreases the risk of a partner cheating (both for males and females). Similarly, the RRM could explain the findings that women tend to be more religious than men because women are usually less sexually permissive and have fewer short-term mating interests than men.

Current Study and Goals

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The present study seeks to a) add to the existing literature on whether religion does fluctuate as a function of environmental contexts, and b) if so, observe the ways in which this fluctuation occurs (i.e., do results support the FCT and a stronger interest in female sexual suppression, or do they support intrasexual competition and a stronger same-sex interest in sexual suppression?)

Hypotheses

If religiosity is a trait that changes as a result of environmental input rather than as a result of genetic and societal influences, and if religion is, in fact, an effective way to regulate others' sexual behavior by imposing injunctions of moral and amoral actions, then I predict that religiosity will shift as a result of the amount of perceived promiscuity in a given environment. Additionally, if both males and females are more intent in regulating female sexual behavior, then shifts in religiosity should be particularly visible when female promiscuity seems high as opposed to male promiscuity. Finally, if females are more intent on monitoring other females, female participants should exhibit a higher increase in religiosity when looking at highly promiscuous female targets.

These three hypotheses can be thus summarized in the following manner:

H1: Individuals will report higher religiosity when promiscuity is salient (i.e., main effect of target promiscuity).

H2: Individuals will report higher religiosity when female (as opposed to male) promiscuity is salient (i.e., two-way interaction between target promiscuity and target sex).

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H3: Female participants will report a higher religiosity increase than male participants when female promiscuity is salient as opposed to when male promiscuity is salient (i.e., three-way interaction among target promiscuity, target sex, and participant sex) .

Methodology

Participants

A total of 185 participants took part in the study. Of these, 36 did not complete the study and were excluded from analyses, leaving a final sample of 149 participants ($N_{females} = 103$, $N_{males} = 47$). While I attempted to recruit a broader sample through Facebook, Reddit, and other social media outlets, the sample consisted mostly of college students ($N = 117$). The sample was also largely composed of younger adults, although there was high variability ($M = 26.24$; $SD = 11.29$).

Measures

To measure religiosity, I used three different measures. The first was a 7-item intrinsic religiosity questionnaire adapted from Li et al. (2010) and Shariff et al. (2008). Participants were asked to rate, on a 7 point scale, the degree to which they agreed or disagreed with statements such as “I believe in God” and “We’d be better off if religion played a bigger role in people’s lives” ($\alpha = .96$).

The second religiosity measure focused on belief in religious agents and was taken from Epley et al. (2008). Participants were asked to rate, on a 10 point scale, the degree to which they believed in angels, devils, miracles, curses, and God ($\alpha = .93$).

Finally, to have a separate measure from self-report scales, I implemented the single-item Implicit Association Test (IAT) used by Shariff et al. (2008). Participants had

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to sort religious objects across two poles of an attribute (i.e., true and false). Religious words included god, heaven, angel, devil, and soul. True attribute words included *actual*, *true*, *genuine*, *real* and *valid*. Finally, false attribute words included *fake*, *false*, *bogus*, *untrue* and *phony*. Block order was counterbalanced across participants.

Another measure used was the Revised Sociosexual Orientation Inventory (SOI-R) (Penke & Asendorpf, 2008). Sociosexual orientation was included to use as a control variable, as studies show that men generally score higher than women do, and religious individuals score lower than do non-religious ones. Higher scores on the SOI-R correspond to a more unrestricted orientation. The SOI-R measures three dimensions of sociosexuality; behavior (e.g., “With how many different partners did you have sex within the past 12 months?” $\alpha = .84$), attitude (e.g., “Sex without love is OK.” $\alpha = .78$), and desire (e.g., “How often do you have fantasies about having sex with someone you are not in a committed romantic relationship with?” $\alpha = .90$). These three dimensions can be aggregated to form a total SOI-R score ($\alpha = .85$).

Procedure

For participants to be able to complete the single-item IAT, the study was conducted via InquisitWeb by Millisecond. The first part of the study was adapted from Marks and Fraley (2005). Participants were told they would be taking part in a perception formation task where they would read about a target and the answers this target had provided in a previous survey. The target could be either male or female. The “previous survey” consisted of 5 questions followed by the target’s answers. Answers to 4 of these questions were the same across conditions, but a fifth question included a promiscuity manipulation. This question asked the target to mention something about himself or herself that not many

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people knew. In the high promiscuity condition, the target admitted to having slept with 19 guys (when the target was female) or 19 girls (when the target was male). In the low promiscuity condition, the target admitted to having slept with 0 partners (as with the high promiscuity condition the words “guys” and “girls” depended on whether the target was male or female). Finally, in the control condition, the target mentioned never having used any type of social network such as Facebook. After reading the fake survey, participants were asked to evaluate the target across several traits such as interesting, smart, lazy, boring, and, most importantly, promiscuous. This was done as a manipulation check to ensure that the promiscuity manipulation had been effective.

Participants were then asked to complete the intrinsic religiosity scale, the belief in religious agents scale and the single-item IAT, respectively. Afterward, they completed the SOI-R and were asked for demographics such as age, sex, sexual orientation, ethnicity, and religious and political affiliation.

Results

Manipulation check

If the promiscuity manipulation was efficient, then targets who have slept with 19 others should be perceived as more promiscuous than either targets who have slept with 0 others or targets in the control condition. Additionally, there should be no early evidence of a double standard because if one target sex is judged as significantly more promiscuous from the very start, then this could boost any effects for that sex but perhaps not for the other sex. For instance, if in line with a SDS, female targets are perceived as highly more promiscuous than male targets, and male targets are not seen as too promiscuous then the

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effect of high promiscuity will be seen for female targets but perhaps not for male targets, not because of lack of support of the FCT, but because the manipulation may not have been strong enough for participants to consider the male target as too sexually permissive, therefore feeling the need to ascribe to religious beliefs that would attempt to keep the target in place.

To assess if the manipulation check was effective, I conducted a 2 (participant sex) x 2 (target sex) x 3 (promiscuity condition) ANOVA. An ANCOVA with sociosexual orientation as a covariate was initially considered, as participants who have slept with many partners themselves may not perceive a target who has slept with 19 others as promiscuous as participants who have had fewer partners. However, correlations found no relationship between perception of the target and any of the dimensions of the SOI-R.

No interaction between sex of the target and perceptions of promiscuity was found, suggesting male targets and female targets were judged similarly. I did, however, find an interaction between the sex of the participant and perceptions of promiscuity $F(2, 136) = 3.49, p = .03$. A simple effects analysis revealed that male participants perceived the target with 19 partners as significantly more promiscuous ($M = 3.87, SE = .22$) than the target with 0 partners ($M = 1.41, SE = .19$) and as significantly more promiscuous than the control target who had never used social networks ($M = 1.87, SE = .29$), $F(2, 142) = 38.97, p < .001$, whereas there was no difference in males' promiscuity perceptions between targets with 0 partners and targets in the control condition. Female participants, on the other hand, also perceived the target with 19 partners as significantly more promiscuous ($M = 3.28, SE = .15$) than the target with 0 partners ($M = 1.42, SE = .14$) and as significantly more promiscuous than the control target ($M = 2.35, SE = .16$); however, they also perceived the

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control target as more promiscuous than the target with 0 partners, $F(2, 142) = 40.87, p < .001$. Overall, the manipulation seems effective as targets with 19 partners were judged as more promiscuous than targets with no partners or control targets, regardless of the target's sex. That female participants also perceived control targets as more promiscuous than targets with no partners should not be of huge concern as the focus of this study is mostly on highly promiscuous targets and whether they lead participants to show increased religiosity compared to lowly promiscuous targets and controls.

Assessing the validity of the Religiosity Measures

Shariff et al. (2008) assessed the convergent validity of the single-item IAT and the intrinsic religiosity scale by assessing their relationship in the control condition and finding a positive moderate correlation. Similarly, I decided to test the convergent validity of the three religiosity measures using bivariate correlations. Intrinsic religiosity was strongly correlated with belief in religious agents, $r(42) = .86, p < .001$, whereas the IAT was not related to either self-report measure.

I then also examined if religious individuals scored differently from non religious individuals across all three measures in the control condition. If the religiosity measures are tapping into religious belief (be these explicit or implicit), then religious individuals should score higher on them than non religious individuals. Participants were divided into a non religious category composed of atheists and agnostics ($n = 12$) and a religious category composed of all other religions such as Christianity, Judaism, Islam, etc. ($n = 20$). Independent samples t-tests revealed that participants in the religious category scored higher ($M = 4.19, SD = 1.81$) on intrinsic religiosity than those in the non religious category ($M = 1.46, SD = .59$), $t(24.96) = 6.19, p < .001$. They also scored higher ($M = 6.10, SD =$

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2.90) in belief in religious agents compared to non religious individuals ($M = 1.72$, $SD = .97$), $t(25.18) = 6.20$, $p < .001$. The single-item IAT did not find any differences for implicit religiosity between religious ($M = -.01$, $SD = .41$) and non religious individuals ($M = .11$, $SD = .45$), $t(30) = .75$, n.s.

Intrinsic religiosity ($\alpha = .96$) and belief in religious agents ($\alpha = .93$) seemed to be both reliable and valid measures. On the other hand, I found no support that the single-item IAT was a valid measure. As a result, all statistical analyses performed do not include the IAT.

Assessing Sociosexuality as a Covariate

Independent samples t-tests were run to examine if there were any gender differences in any of the sociosexual orientation dimensions. Females reported a significantly *more* unrestricted behavior ($M = 3.26$, $SD = 1.90$) than males did ($M = 2.54$, $SD = 1.85$), $t(146) = 2.16$, $p = .03$ whereas males reported a more unrestricted desire ($M = 3.74$, $SD = 1.32$) than females did ($M = 2.61$, $SD = 1.13$), $t(146) = 5.35$, $p < .001$. I found no significant gender differences in attitude nor in overall sociosexual orientation.

Next I examined the relationship between sociosexual orientation and religiosity. Bivariate correlations showed that intrinsic religiosity had a moderate inverse relationship with the attitude dimension, $r(149) = -.39$, $p < .001$ and a small negative correlation with total sociosexual orientation, $r(149) = -.26$, $p = .001$. Belief in religious agents similarly was negatively correlated with attitude, $r(149) = -.31$, $p < .001$) and total sociosexual orientation, $r(149) = -.18$, $p = .03$.

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The total sociosexual scores were used as a covariate because a) using all dimensions of sociosexuality simultaneously would have resulted in collinearity, b) total sociosexuality is more meaningful and a better index of unrestricted sociosexuality than any dimension alone, and c) it was related to the dependent variable but not to the independent variable of participant sex, which is an interpretation requirement for covariates (Field, 2013).

Intrinsic Religiosity

For intrinsic religiosity, a 2 (participant sex) x 2 (target sex) x 3 (promiscuity condition) ANCOVA with sociosexuality as a covariate was run. Sociosexuality was significantly related to intrinsic religiosity, $F(1, 135) = 16.62, p < .001, \text{partial } \eta^2 = .03$. The three way interaction was not significant. However, the interaction between participant sex and target sex was marginally significant $F(1, 135) = 3.73, p < .06, \text{partial } \eta^2 = .03$. Pairwise comparisons revealed that, while male and female participants did not differ in religiosity when evaluating either male or female targets, male participants who read about male targets ($M = 1.87, SE = .49$) scored significantly lower in intrinsic religiosity than male participants reading about female targets ($M = 3.48, SE = .36$), $F(1, 135) = 7.00, p < .01, \text{partial } \eta^2 = .05$ (see Figure 1). Table 1 shows the means and standard errors for the interaction between participant sex and target sex. There was also a main effect for target sex $F(1, 135) = 6.76, p = .01, \text{partial } \eta^2 = .05$ whereby participants reported higher intrinsic religiosity when presented with female targets ($M = 3.17, SE = .22$) than with male targets ($M = 2.24, SE = .28$).

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Table 1. *Interaction Between Participant Sex and Target Sex for Intrinsic Religiosity*

		Target Sex	
		Male	Female
Participant Sex	Male	1.87 ^a (.49) (<i>n</i> = 17)	3.48 ^b (.36) (<i>n</i> = 30)
	Female	2.61 ^{ab} (.26) (<i>n</i> = 50)	2.85 ^{ab} (.25) (<i>n</i> = 51)

Note: Standard errors are presented in parentheses next to each mean. Sample size is reported in parentheses below its respective mean. The covariate is evaluated at the mean value for total sociosexual orientation. Means with different subscripts are different at $p < .05$.

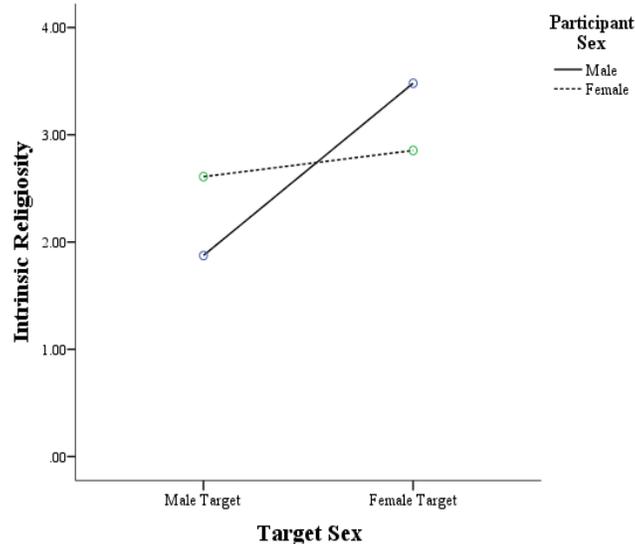


Fig 1. *Interaction between participant sex and target sex for intrinsic religiosity.* Male and female participants did not differ from each other in intrinsic religiosity when viewing male or female targets. However, male participants reading about a male target did have lower intrinsic religiosity scores than males reading about a female target. Additionally, the main effect for target sex revealed that intrinsic religiosity was higher when the target was female.

Belief in Religious Agents

For belief in religious agents, another 2 (participant sex) x 2 (target sex) x 3 (promiscuity condition) ANCOVA with sociosexuality as a covariate was conducted. Sociosexuality was significantly related to intrinsic religiosity, $F(1, 135) = 8.22, p = .005$, partial $\eta^2 = .06$. The three way interaction was not significant; however, the interaction

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between participant sex and target sex was, $F(1, 135) = 4.33, p = .04, \text{partial } \eta^2 = .03$. Pairwise comparisons revealed that while female participants who read about a female target did not differ in belief in religious agents from female participants who had read about a male target, male participants reading about male targets ($M = 2.46, SE = .77$) scored lower than male participants reading about female targets ($M = 4.60, SE = .57$), $F(1, 135) = 4.84, p = .03, \text{partial } \eta^2 = .04$. Additionally, no significant differences between male and female participants were found when reading about a female target. When reading about a male target, female participants scored higher in belief in religious agents ($M = 4.60, SE = .42$) than did male participants ($M = 2.46, SE = .78$), $F(1, 135) = 6.33, p = .01, \text{partial } \eta^2 = .04$ (see Figure 2). Table 2 shows the means and standard errors for the interaction between participant sex and target sex. There was also a marginal main effect for participant sex $F(1, 135) = 3.46, p = .06, \text{partial } \eta^2 = .02$ whereby female participants scored marginally higher ($M = 4.57, SE = .29$) than male participants ($M = 3.53, SE = .48$). Finally, there was a marginal main effect of target sex $F(1, 135) = 2.86, p = .09, \text{partial } \eta^2 = .02$. Participants had marginally higher scores when the target was female ($M = 4.53, SE = .35$) than when the target was male ($M = 3.57, SE = .44$).

Table 2. *Interaction Between Participant Sex and Target Sex for Belief in Religious Agents*

		Target Sex	
		Male	Female
Participant Sex	Male	2.46 ^a (.78) (<i>n</i> = 17)	4.60 ^b (.57) (<i>n</i> = 30)
	Female	4.67 ^b (.42) (<i>n</i> = 50)	4.46 ^b (.40) (<i>n</i> = 51)

Note: Standard errors are presented in parentheses next to each mean. Sample size is reported in parentheses below its respective mean. The covariate is evaluated at the mean value for total sociosexual orientation. Means with different subscripts are different at $p < .05$

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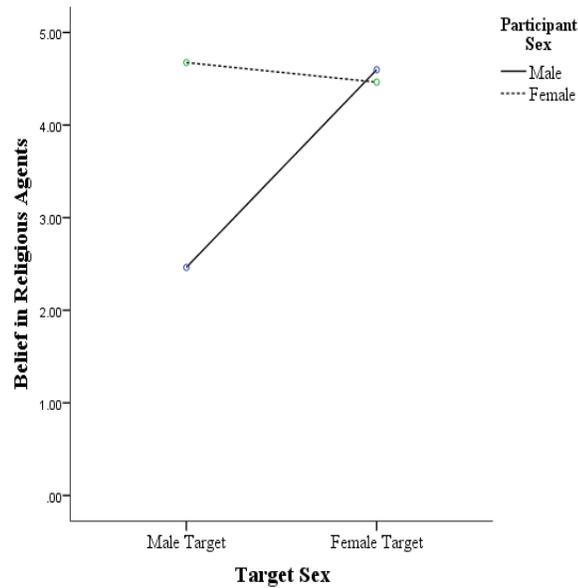


Fig 2. Interaction between participant sex and target sex for belief in religious agents. Belief in religious agents was not different for females exposed to a male target and females exposed to a female target, but it was different for males exposed to a male target and males exposed to a female target. Male participants did not differ from female participants when reading about a female target, but, when reading about a male target, female participants scored higher than male participants.

Discussion

Because religious groups seek to regulate several aspects of sociosexuality and promote a long-term, monogamous mating strategy, I hypothesized that high promiscuity of anonymous targets would lead participants to become more religious, and that this effect would be stronger for participants reading about a female target, particularly when the participants themselves were females. The first hypothesis, which predicted a main effect for promiscuity, was not supported. After controlling for sociosexuality, I found no differences in either intrinsic religiosity or belief in religious agents among the promiscuity conditions. In fact, promiscuity seemed unrelated to any results. This could mean that people are simply not interested in how promiscuous others are; however, this does not

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necessarily mean that people are not interested in those around them. That I found a few interactions suggests that, while promiscuity did not affect religiosity in any way, other variables did. Thus, perhaps people have a general interest to enforce long-term strategies and injunctions upon others regardless of whether or not others are already engaging in these strategies in the first place.

The second hypothesis predicted that participants, regardless of their sex, would show higher religiosity when female promiscuity was high than when male promiscuity was high. As mentioned, target promiscuity did not seem to be related to religiosity at all, and there was no interaction between target sex and promiscuity condition. There was, however, a two-way interaction between participant sex and target sex for both intrinsic religiosity and belief in religious agents, although the one for intrinsic religiosity was only marginally significant. Controlling for sociosexual orientation, male and female participants exposed to a female target did not differ from each other in either religiosity measure, although female participants exposed to a male target did score higher in belief in religious agents than male participants exposed to a male target. Given that the MCT and FCT debate states that one sex is more concerned with the sexual behavior of females than the other sex, these results do not support either theory. Nevertheless, that we found a significant main effect of target sex for intrinsic religiosity and a marginal effect of target sex for beliefs in religious agents does suggest a higher general interest in females, regardless of their sexual behavior.

Male participants did show lower intrinsic religiosity and belief in religious agents when reading about a male target than they did when reading about a female target. This was not the case for females presented with a male target versus females presented with a

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female target. Thus, while males seemed more affected than females were by a male target, females showed no religiosity differences as a function of target sex. Compared to all other means, male participants seemed to have a decrease in religiosity when the target was male, and this was true for both religiosity measures. This result goes against findings from Li et al. (2010) where male participants were more religious when looking at several dating profiles of same-sex others than when looking at profiles of opposite-sex others.

The final hypothesis predicted a three-way interaction where female participants were more religious than male participants when exposed to a highly promiscuous female target. No interaction between the three independent variables was found, even after controlling for participant sociosexuality. Overall, sociosexuality was a significant covariate, and controlling for it revealed that males did have decreased religiosity when exposed to a male target than to a female target, whereas the type of target females were given did not affect their religiosity. Target sex seemed to affect male participants but not female participants. Promiscuous behavior had no effects nor did it interact with any of the independent variables.

Limitations

A major caveat of this study is that the sample was composed mostly of younger college students at a highly liberal institution. Considering that a) there were no significant sex differences in overall sociosexuality when past studies suggest that males are more permissive than females cross-culturally, and b) females in the sample even had a more unrestricted sexual behavior than males, there is good reason to suspect the sample might not be representative of the general population. Additionally, low numbers for all conditions, particularly those with male participants make generalizability difficult.

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A second limitation is the use of written stimuli. Vignettes were chosen over visual stimuli because several factors moderate responses to visual sexual stimuli in men and women. For instance, men tend to perceive more sexual intent than women do when evaluating female targets (Koukounas & Letch, 2001), and this effect is even independent of whether these targets interact with another female or another male (Abbey, Cozzarelli, McLaughlin, & Harnish, 1987). Additionally, use of revealing clothing does not affect participants' ratings of male targets' sexuality, but it does affect that of female targets, who are rated higher on sexual traits such as flirtatiousness, seductiveness, sexiness, and promiscuity. Other nonverbal cues such as eye contact, touch, and proximity also create sex differences in perception of visual stimuli. Koukounas and Letch (2001) suggest that it is possible that men have lower perceptual thresholds for sexual-information processing and may require less sociosexual information than women before labeling a situation as sexual. Rupp and Wallen (2008) state that there are differential responses to the content of the stimuli being used. Men are more influenced by the sex of the actor and prefer stimuli that allow objectification of such, while contextual factors and social scenarios may be more important for women. Because the quantification of the characteristics that are differentially appealing to men and women are currently unknown, using visual stimuli could risk having one sex over perceive sexual intent more than the other sex. This could consequently lead to stronger activations of mating mechanisms in one sex, and thus it would not be possible to tell whether any effects are due to the target's actual promiscuity or the sex differences in the *perceived* promiscuity of the target. Even written stimuli might not solve this issue, as the manipulation check found sex differences in perception of target promiscuity (e.g., male participants perceiving no promiscuity difference between the target with 0 partners and the control target, whereas female participants judged the control target as more promiscuous

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than the target with no partners). Additionally, even if written stimuli did solve this problem, visual stimuli have higher ecological validity since people usually make judgments on others' sexual behavior through observations such as clothing, social context, body language, and so forth.

A final limitation of this study was the challenge of measuring trait versus state religiosity. While there are psychometrically valid religiosity scales, several of these focus on religiosity aspects that are not likely to change throughout the duration of the study. For instance, the religious commitment inventory (Worthington, Wade, Hight, Ripley, McCullough, Berry, Schmitt, Berry, Bursley & O'connor, 2003) includes items such as "I often read books and magazines about my faith." Responses to such items will naturally not change because they measure trait religiosity. To my knowledge, there is no scale that assesses state religiosity, and while Durante et al. (2013), Li et al. (2010), Shariff et al. (2008), and the present study found significant results using the adapted intrinsic religiosity scale, alternative methods to measure state religiosity would be worthwhile to investigate. In a study assessing whether liberals thought more analytically (more "WEIRD") than conservatives, Talhelm, Haidt, Oishi, Zhang, Miao, and Chen (2015) manipulated thought style (analytical, holistic, or control) to see if style caused people to come to more liberal or conservative conclusions with regards to a partisan article (i.e., more generous welfare programs) and a non partisan article (i.e., mainstreaming special education students). The authors argued that the articles gave participants the chance to form an opinion on a particular policy rather than a general attitude. A similar procedure could attempt to measure state religiosity. For instance, to further test the hypothesis that high promiscuity and permissive behavior are interpreted as a threat by individuals pursuing long-term

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interests and ascribing to religious groups that attempt to regulate sexual behaviors might be an effective means to deal with this threat, participants could read an article where a religious group (e.g., the Catholic church) wants to implement a new policy related to regulating sociosexuality. If groups exposed to different promiscuity levels show different degrees of agreement towards the policy, then perhaps religion is an institution people turn to when it is in their best interest to monitor and control the sexual behavior of their peers.

Future Directions

While only a few studies have attempted to manipulate religious thoughts and behaviors, the study of religiosity as contingent on environmental factors merits future research, especially since this handful of studies found significant results. Because religiosity is such a complex phenomena that taps into a plethora of psychological mechanisms related to survival and reproductive fitness, activating one of these mechanisms may collaterally affect religiosity. Such was the case when participants were made to feel excluded from a social group (Epley et al., 2008). Because exclusion could prove fatal in ancestral environments, individuals who felt they lacked social connection with other humans tried to compensate by creating a sense of human connection with nonhuman agents, thus leading to the study's results where excluded participants showed higher anthropomorphization of nonhuman animals, gadgets, and religious agents. Similarly, given results by Durante et al. (2013) and Li et al. (2010), future research should keep examining how religiosity is affected by mechanisms related to mating and reproductive fitness.

Additionally, if, according to the Reproductive Religiosity Model, people adapt their levels of religious participation so that these match their current life-history plans,

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then any social institution that, like religion, promotes regulations on sexual behavior should be beneficial for members pursuing long-term interests. Conservative versus liberal politics could be another example of these institutions, and so it would be of interest to see if political opinions are also contingent on mating mechanisms. Durante et al. (2013) did find that ovulation led single women to become more liberal and more likely to vote for Barack Obama whereas ovulating women in committed relationships became more conservative and more likely to vote for Mitt Romney. Thus, that both religious and political views are linked to reproductive goals is not an implausible idea.

Future research should also focus on methods to separate and measure different domains of religiosity. As previously mentioned, religion is a complex construct that seems related to a variety of psychological mechanisms. The domain this study sought to explore relates to interpersonal coercion and a desire to force others to behave in particular ways. As such, most religiosity scales do not tap into religion as “Machiavellian.” A close alternative would be using the Allport and Ross (1967) Religious Orientation Measure that places individuals somewhere on the intrinsic-extrinsic religiosity spectrum. An extrinsic religious orientation means using religion for one’s own ends. People with a high extrinsic orientation may use religion to obtain security, social support, status, and so forth. On the other hand, and intrinsic orientation involves finding purpose in religion and *living* it. While the I-E framework has been widely used, it has faced vast theoretical and methodological criticism (Kirkpatrick & Hood, 19990). Even if the framework were entirely reliable and valid, items still focus on state religiosity. For instance, a sample item for the extrinsic subscale is “What religion offers me most is comfort when sorrows and

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misfortune strike.” Answers to such items are unlikely to change as a function of a momentary manipulation.

Another close framework is the tripartite theory of Machiavellian morality suggested by Asao and Buss (2016). The authors argue that the concept of morality comprises three distinct adaptations. One of these, *moral influence*, consists of mechanisms that evolved to control and alter the behavior of others to be less exploitative and more prosocial. Examples of moral influence include praise, rewards, rehabilitation, and physical punishment, and damaging one’s reputation and coordinating ostracism with other group members. While the authors do not mention religion, it seems evident from the Reproductive Religiosity Model that religious groups engage in moral influence. Unfortunately, there are no scales that may measure religious moral influence. The item “We’d be better off if religion played a bigger role in people’s lives” from the intrinsic religiosity scale seems to relate to moral influence and interpersonal coercion the most, as it suggests that the person wishes to enforce certain rules on others. Developing a scale with similar items could prove worthy in the study of religion as a means to an end.

Finally, with regards to the MCT and the FCT, a good way to further investigate these would be to look at mating status. The MCT predicts that only males who have a mate would attempt to suppress female sexuality, whereas the FCT predicts that women can benefit from stifling the sexuality of other women regardless of whether they have a mate. While sociosexuality was measured as a proxy to control for participant mating strategy, relationship status was not used as a variable. Future studies could examine any interactions between participants’ sex and relationship status. Additionally, the MCT and the FCT, while often seen as opposing theories, are not necessarily exclusive. As I have discussed, it

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is likely that members of *both* sexes attempt to regulate female sexual conduct because both sexes can benefit from it. As such, research may benefit from seeing these theories as complimentary rather mutually exclusive.

Conclusion

New studies suggest that religiosity may be more fluid than previously thought. Additionally, because of the strong relationship between religiosity and sexual behavior, religiosity may change as a factor of an individual's reproductive goals. More specifically, individuals pursuing long-term mating strategies may be more likely to ascribe to religious groups because these promote such strategies, whereas individuals pursuing short-term mating gain little by affiliating themselves to institutions that will attempt to impose regulations on their permissive sexual behavior. The current study sought to further explore if manipulating perceived promiscuity in participants' environment increased religious beliefs. While promiscuity of an anonymous target had no effect, reading about a male versus a female target had different effects on religious beliefs for male versus female participants. Future studies should further delve into religiosity as a mating strategy.

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