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How Does It Work? An Exploration into Psychosocial Mechanisms that Underlie 
Associations between Religiosity/Faith and Sexual Risks in Emerging Croatian Adults

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Abstract:

Although a number of studies reported negative associations between young people's religiosity and risky sexual behavior, psychosocial mechanisms that might underlie these links have not been directly assessed. Utilizing structural equation modeling approach, current study explored three such mechanisms: (A) internal motivation (internalization), (B) external motivation (peer influence), and (C) mixed motivation (collective identity), using data from a population-based online panel of 1,200 emerging Croatian adults aged 18-25 years. Observed mechanisms were gender-specific: while a combination of internal and external motivation was observed among female participants, both mixed and internal motivations were relevant for male participants. Contrary to expectations, the link between the mixed motivation mechanism and sexual risk taking was positive. Overall, the weak associations found in this study suggest that religiosity and personal faith do not play a substantial role in emerging Croatian adults' sexual and reproductive health.

Key Words: Religiosity; faith; sexual risk taking; emerging adults; psychosocial mechanisms

How Does It Work? An Exploration into Psychosocial Mechanisms that Underlie Associations between Religiosity/Faith and Sexual Risks in Emerging Croatian Adults

INTRODUCTION

In the late 2012, the first culture war erupted in Croatia. The dividing issue was a governmental decision to introduce the first sexuality education program, envisioned as a part of Health Education curriculum, in all primary and secondary schools (Hodžić & Štulhofer, 2017). The program, based on the World Health Organization (WHO) guidelines for comprehensive sexuality education in Europe (WHO Europe, 2010), was intended for young people aged 12-18 years. Even though contents related to sexuality were to take less than five school hours per year, the initiative met with strong and well-organized resistance from conservative non-governmental organizations, which enjoyed full support of the Croatian Roman Catholic Church (Hodžić & Štulhofer, 2017). At the time, most parents, according to polls, supported the program (Kuštreba et al., 2015). Nevertheless, the pressure exerted on teachers and schoolmasters by a vocal minority of parents mobilized by the religious right, combined with poor planning, inadequate public engagement, and a lack of support to schools from the Ministry of Science and Education (Kuštreba et al., 2015), effectively blocked the program's implementation. In 2018, the program was officially terminated.

The opponents of the program were quick to emphasize that they had nothing against sexuality education as such but were objecting to the proposed, "overly liberal", curriculum and the institutionalization of sexuality education. Parents mobilized by the religious right argued that they were defending the right to teach their children about sexuality-related issues according to family beliefs and moral values. One of the main arguments put forward by the organizers of the protest (Hodžić & Štulhofer, 2017; Kuštreba et al., 2015) was that parents are best educators when sensitive issues such as sexuality are in question. This, however,

seems to be at odds with scientific evidence. Although the literature suggests that parent-child communication about sexuality can have a positive influence on young people's sexual and reproductive health (e.g., by delaying sexual debut and encouraging safer sex), parents are rarely the primary educators when it comes to sexuality (Noorman et al., 2022). The reasons are multiple, including unpreparedness (lack of relevant information and skills required for successful communication about sensitive issues), embarrassment (often exacerbated by similar embarrassment experienced by their teenage child), and fears that educating about sexuality will send a wrong message and encourage sexual experimentation (Noorman et al., 2022). Among more religious and conservative parents, limited knowledge, discomfort, and delayed conversation are not the only barriers to discussing sexuality. It has been observed that such parents are more likely to focus on negative consequences of sexual activity and avoid discussing contraception (Malacane & Beckmeyer, 2016).

To contribute to the understanding of the risk reducing potential of religiosity and personal faith, the current study aimed to explore psychosocial mechanisms underlying the association between religious upbringing and sexual risk taking in emerging adulthood. Although our analysis does not tackle the question about religious parents' ability to provide meaningful sex education to their children, it investigates a broader context of growing up in a religious family and subsequent religious development as factors that may reduce sexual risks (Haglund & Fehring, 2010; Manlove et al., 2008; Turbin et al., 2006; Vigliotti et al., 2020). More specifically, we were interested in *how* this risk reduction is played out, if at all, in emerging adulthood. The analysis has ramification for debates about school-based sexuality education and the role of religiosity in young people's sexuality.

Religiosity/Faith, Sexuality, and Reproductive Health

In this study, we distinguish between religiosity, or a more formal and external (i.e., socially ritualized) expression of one's acceptance of religious norms, and personal faith,

which we define as a more informal and personal (i.e., internalized) belief system based on religious scriptures. Given that the two constructs—public and private religiosity (Adamczyk & Felson, 2006; Salas-Wright et al., 2014)—are often interrelated, we use the “religiosity/faith” label to denote a complex and person-specific web of religious beliefs, behaviors, and identity issues.

It has been demonstrated that religiosity/faith is associated with health-promoting attitudes and behaviors (Regnerus, 2003; Rew & Wong, 2006). In young people, this is primarily reflected in lower risk of cigarette, alcohol, and illicit drugs use among religious individuals compared to their less religious or agnostic peers (Nonnemaker et al., 2003). This protective role of religiosity/faith has also been investigated in the context of young people’s sexual and reproductive health. Here, the findings are mixed (Koletić et al., 2021; Schnitker et al., 2021). Some studies reported no significant linkage (Green et al., 2020), while others observed a lower probability of sexual activity and multiple sexual partners, as well as delayed sexual debut, in religious youth (Haglund & Fehring, 2010; Lefkowitz et al., 2004; Puzek et al., 2012; Rostosky et al., 2004). Noteworthy, some of the studies in the latter group found the role of religiosity/faith in sexual risk taking ambivalent, with religiosity/faith indicators related to lower probability of having sex or reporting early sexual debut, but also with lower odds of condom and other contraceptives use (Moreau et al., 2013; Piper et al., 2022). When observed, the reported associations were mostly of small size (Koletić et al., 2021).

Moderating Role of Gender

In the literature on religiosity/faith and young people’s sexuality, gender-specific findings are frequently reported. The risk reduction function of religiosity/faith has been more often observed in female than male participants (Puzek et al., 2012; Rostosky et al., 2004; Štulhofer et al., 2011). To explain this moderating effect of gender, several explanations have

been proposed. First, women report higher levels of religiosity/faith than their male peers (Miller & Hoffmann, 1995; Rostosky et al., 2004). If interpreted following the dose-response model, it would indicate a higher female susceptibility to religious regulation of sexuality. This is in line with Baumeister's (Baumeister, 2000) suggestion, based on gender differences in attitudes toward sex, sexual behaviors, and the stability of both the attitudes and behaviors, that women are characterized by higher erotic plasticity than men. According to this concept, social regulation of sexuality (including, historically important, religious norms) affects female sexuality (i.e., beliefs, attitudes, and behaviors) more substantially than male sexuality, which is more biologically driven. Social norms and expectations were theorized to play a much larger role in shaping female than male sexuality. Finally, it has been argued that the process of sexual socialization, particularly during adolescence and emerging adulthood, is markedly gender specific. According to the Gendered Sexuality over Life Course Model, societal scripting of sexuality and sexual interactions has been systematically and consistently gendered, with far less restrictions and moral expectations placed on male compared to female sexual behavior (Carpenter, 2010). This is the fabric of the sexual double standard (Crawford & Popp, 2003; Kreager et al., 2016). Overall, the proposed explanations indicate that the relationship between religiosity/faith and sexual behavior should be explored by gender, particularly among adolescents and young adults.

Psychosocial Mechanisms Underlying Religiosity/Faith and Sexual Behavior

The question about which religiosity/faith components (Adamczyk & Felson, 2006; Huber & Huber, 2012; Lefkowitz et al., 2004; Pearce et al., 2017) are mostly responsible for observed risk reduction effects remains largely unanswered. Older studies often explored the contribution of a single component, while in more recent research, in which multi-item operationalization of religiosity is the norm (Ahrold et al., 2011; Rostosky et al., 2004), different facets of religiosity are usually tested separately, to avoid multicollinearity issues

(Piper et al., 2022). The important question, we would argue, can be re-phrased and tested as an investigation of psychosocial mechanisms underlying the relation between religiosity/faith and sexual risks.

Analytically oriented social science has focused on elucidating (psycho)social mechanisms (PSMs) that underlie an association of interest. Somewhat simplified, PSM can be described as a chain of events or actions that (fully) mediate the influence of an independent variable (X) on a dependent variable (Y) (Hedstrom, 2005). Ideally, PSM can be said to “explain” the association between X and Y by pointing to (measurable) necessary conditions for Y, apart from X. Given that causal relations in social science are at best suggested, causal language employed in the literature on PSMs (and in this study) should be understood as a conceptual crutch. It does not imply (true) causality.

Several broad mechanisms, such as social control, self-regulation, and internalization of specific beliefs, have been proposed to account for the protective role of religiosity/faith in the context of adolescent sexuality (Hardy et al., 2013; Rostosky et al., 2003). Social control refers to public aspects of religiousness, or, more precisely, the influence exerted by religious social environment. Church goers are expected to respect and follow norms that are common for a specific religious community. A failure to do so entails a risk of being sanctioned—ranging from reputation loss to being ostracized—by other members of the community. More specifically and more relevant for young people, deviating from what is socially desirable carries the risks of alienating close peers, which is why some studies found that having religious friends is a stronger predictor of sexual behavior than standard indicators of religiosity/faith (Adamczyk & Felson, 2006; Regnerus, 2007).

In contrast, self-regulation and internalization are more related to personal faith and the extent to which religious values, norms, and moral guidance have become an essential part of the person’s identity. Thus, internalization denotes the existence of a set of psychological

rewards and costs that guide behaviors regardless of external norms and expectations. In this context, self-regulation can be understood as an internal control system built around the anticipation of negative consequences of engaging in behaviors disapproved by religious teachings. To the best of our knowledge, none of these mechanisms have been directly tested, either separately or comparatively, in the literature on the sexual risk reduction role of religiosity/faith.

The Current Study

To append the literature, this study employed the PSM approach to explore the role of religiosity/faith in reducing risky sexual behavior. The first step was to build a developmentally plausible model of associations between distinct facets of religiosity/faith, with particular attention paid to the modelling of paths (between the facets) that would respect a realistic time sequence. There were two reasons for such focus. First, without distinguishing the main components of religiosity/faith using a developmentally logical timeline it would be impossible to explore distinct mechanisms, which are related to different (and interrelated) components of religiosity/faith. Secondly, a plausible time sequence, which would reflect the process of social consolidation of religiosity (Hayward & Pearce, 2021; Pearce et al., 2017), enables treating some components of religiosity/faith as elements of PSMs chains.

To enable a comparative analysis of distinct PSMs, we created a developmental model of the religiosity/faith risk reduction role (presented in Figure 1) following Hayward's and Pearce's (Hayward & Pearce, 2021) empirically informed theorizing about the dynamics of religious identification. The model's developmental character is reflected in the distinction between distal (religious upbringing) and more proximal facets of religiosity/faith. The proximal part of the diagram starts with the attendance of religious ceremonies and the development of personal faith, both of which are direct consequences of growing up in a religious household ("religious transmission"; (Hayward & Pearce, 2021). Interconnectedness

of the two constructs denotes a feedback loop between church attendance, which directly or indirectly (i.e., through socializing with religious peers before and after the service) encourages and strengthens religious beliefs, and personal faith, which motivates future attendance. Through proximity to peers with similar beliefs and values, and the increasing salience of religion (increasing importance of faith for personal identity; see (Pearce et al., 2017), religious services attendance and personal faith were hypothesized to increase the likelihood of having more religious peers as close friends, as well as participation in faith-based activities (religious engagement).

Having more close friends who are religious and the experience religious engagement—which may amount to a faith-based collective action (such as collective prayer or a group pilgrimage)—were hypothesized to fully mediate the association between church attendance and the outcome (i.e., sexual risk taking). In contrast, the two constructs were expected to mediate the association between personal faith the sexual risk taking only partially, because faith may indicate the internalization of specific moral beliefs and prescriptions, which would operate independently from peer influence and collective identity forged through religious engagement. Thus, we explored three paths—or PSMs—that lead from proximal religiosity/faith indicators to the outcome. The first (path A) represents the internalization of moral beliefs as a mechanism of risk reduction (Zaleski & Schiaffino, 2000). The path reflects internal motivation not to engage in sexual risk taking. The second path (B) denotes peer influence as a mechanism underlying the protective role of religiosity/faith. In contrast to path A, path B represents external motivation (maintaining face or good reputation among religious friends; see (Cheadle & Schwadel, 2012) to avoid sexual risk taking. The final path (C) is likely a combination of external and internal motivation, with elements of social influence (religious co-engagement) mixing with internalized, identity embedded moral beliefs (Ysseldyk et al., 2010). Given that it can be both a public (social) and

private (spiritual) experience, participation in faith-based activities was hypothesized to represent a mixed motivation-based mechanism of sexual risk reduction.

*** FIGURE 1 ABOUT HERE ***

Summarily, the following two research questions were explored in this study:

RQ1: Which of the mechanisms specified in the developmental model—internal motivation (path A), external motivation (path B), or mixed motivation (path C)—is characterized by the largest effect size? The path with the largest effect would be of central importance in explaining the risk reduction role of religiosity/faith in the context of emerging adults' sexual behaviors.

RQ2: Are the mechanisms implicated in sexual risk reduction role of religiosity/faith gender-specific?

The proposed analysis has implications for both theory- and empirically-driven research on religiosity and young people's sexuality, but also for discussions about strategies to reduce young people's vulnerability to sexual risk taking. When the importance of comprehensive school-based sexuality education is weighted against the protective role of religious upbringing and religious morality, insights about the mechanisms underlying this potential reduction of sexual risks are essential.

METHOD

Participants

Our sample included 1,200 emerging Croatian adults (18-25 years, $M_{\text{age}} = 21.7$, $SD = 2.21$; 48.0% female participants). Two-stage stratified sampling by region and settlement size was applied to randomly draw eligible participants from a commercial panel database. The database consisted of participants who took part in national probability-based (face to face or phone) surveys and accepted an incentivized offer to join the panel.

Considering the COVID-19 pandemic restrictions and public concerns, a commercial panel was employed as the most feasible and efficient access to potential participants. To be broadly representative of the emerging adult population in Croatia, the sample was weighted for gender and age. For a more detailed description of the sampling procedures and sample characteristics, see Landripet et al., 2022. All study procedures were approved by the Ethical Research Board of the Faculty of Humanities and Social Sciences, University of Zagreb (blinded for anonymity).

Measures

Sexual risk index was an additive scale composed of five common indicators of sexual risk taking: (a) multiple sexual partners in the past 12 months, (b) concurrent sexual partnerships (lifetime), (c) anal or vaginal intercourse with an unknown partner (lifetime), (d) inconsistent condom use in the past 12 months, and (e) a condom not used at most recent anal or vaginal sexual intercourse. Given that all five indicators were dichotomous variables, the sexual risk index ranged from 0 (no sexual risk taking) to 5 (the highest level of sexual risk taking). The index ranged from 0 to 5 ($M = 1.42$, $SD = 1.11$).

Following multi-faceted approach to measuring religiosity/faith phenomena (Lefkowitz et al., 2004; Pearce et al., 2017; Rostosky et al., 2003), five indicators of religiosity and faith were used in the current study. *Religious upbringing* was assessed with a single item: “Were you raised in a religious spirit in your family?”. In Croatian, this is the common phrase that asks about being raised religiously at home. Answers were anchored on a 7-point scale ranging from “not at all” to “I was raised to strictly respect and follow religious principles”. *Religiosity* was measured using the standard indicator of the frequency of religious service attendance (Rossi & Scappini, 2014), with a 7-point scale, ranging from “I am not religious” to “Almost every day”, for recording answers. Personal faith was indicated by five items of the Short Personal Religiosity Scale (e.g., “I live according to my faith” and

“My faith is helping me in dealing with difficulties and problems in life”) (Bezinović et al., 2004). The scale had good internal consistency in this study (Cronbach’s alpha = 0.91); its composite ranged from 1 to 5 ($M = 3.10$, $SD = 1.14$). To estimate the impact of religiosity through the influence of *religious friends*, we calculated the proportion of “truly religious” friends from the total number of “close friends” (defined as “those whose support and help you can always count on”) reported by the participant. Finally, the *engagement in faith-based activities* was addressed using a four-item Evangelical Civic Activities subscale (e.g., “Participation in faith and spirituality events” and “Participation in educational activities focusing on religious values”) of the recently developed and validated multi-faceted Faith-Based Social Engagement Scale (Landripet et al, 2020). In the current study, the subscale demonstrated acceptable reliability (Cronbach’s alpha = 0.77).

Data Analysis

Based on the conceptual model (see Figure 1), our exploration of psychosocial mechanisms was carried out using path analysis with two latent variables (personal faith and faith-based engagement). Direct comparisons of paths in the female and male sample were attempted using multi-group approach after obtaining at least partial scalar invariance across gender for the two latent indicators. Model fit was evaluated according to the following guidelines (Byrne, 2010; Little, 2013): CFI values around or higher than 0.95 and RMSEA values around or lower than 0.05 (with the upper 90% confidence interval bound lower than 0.08) indicated good fit to the data. To test whether gender differences in statistically significant paths reached statistical significance, we employed the standard chi-square difference test. If the model with a path of interest fixed to equality across gender had similar fit to the model in which the path was freely calculated, gender-specific path coefficients were not significantly different.

The significance of multiple mediation (having religious friends and faith-based engagement were hypothesized to mediate the influence of personal faith on sexual outcomes) was tested by bootstrapping the model (using 5,000 resamples) and inspecting the obtained 95% confidence interval around unstandardized indirect effect (Shrout & Bolger, 2002). Mediation was significant if the interval did not include zero. Missing information was dealt with using full information maximum likelihood approach, which utilizes all available information (Graham, 2009).

Given that association between religiosity/faith and sexual risk taking is likely ambiguous—e.g., religious teaching discourages multiple sexual partners, but also condom use—in the next step we used multivariate logistic regression analysis to examine potential ambiguity of our index of sexual risk taking. Condom use at most recent anal or sexual intercourse was the outcome, while the five indicators of religiosity and faith were included as independent variables, with parents' education (primary, secondary or tertiary) and place of residence (rural vs. urban) added as controls.

To test the robustness of regression findings, the analysis was repeated (a) with the data weighted for a complexed sampling design, (b) only with participants who passed both attention trap tests, and (c) with missing data replaced by multiple imputations ($m = 20$; (Graham, 2012).

All analyses presented in this paper were carried out by gender for three reasons: (1) women report higher levels of religiosity and faith compared to men (Miller & Hoffmann, 1995; Rostosky et al., 2004); (2) women have been found to report substantially lower levels of sexual risk taking (Štulhofer et al., 2009), and (3) sexual socialization has been conceptualized as markedly gendered (Carpenter, 2010).

RESULTS

Sociodemographic and Socio-Sexual Characteristics of the Sample

Table 1 shows the basic statistical information about our sample. After applying Bonferroni's correction for multiple comparisons, significant gender differences were observed in three of the seven indicators. On average, female participants reported higher levels of personal faith and were more involved in faith-based collective activities than their male peers. Furthermore, male participants reported sexual debut at an earlier age than female participants. As indicated by Cohen's *d* indicator, these differences were small. Table 2 shows zero-order correlations between the key indicators.

*** TABLES 1 AND 2 ABOUT HERE ***

Path Analytic Exploration of Psychosocial Mechanisms

In the first step, we explored if the two latent constructs (personal faith and participation in faith-based activities) were gender invariant. In multi-group assessment, in which progressively more parameters were fixed to equality across gender (van de Schoot et al., 2012), both constructs reached at least partial scalar invariance. The personal faith construct reached partial scalar invariance after the intercept of one of the five manifest indicators was allowed to freely estimate in each gender group.

Next, a structural model based on the conceptual model depicted in Figure 1 was explored, using multi-group analysis by gender, for fit to the data. All fit indices ($\chi^2_{(129)} = 387.06$, TLI = .948, CFI = .957, RMSEA = .047 [95% CI = .042-.052]) indicated a good fit. Next, we checked an alternative (nested) model, with an added direct path from religious upbringing to the outcome. Considering that the fit of this alternative model ($\chi^2_{(127)} = 384.22$, TLI = .947, CFI = .957, RMSEA = .047 [95% CI = .042-.053]) was statistically indistinguishable from the initial model fit, the more parsimonious model presented in Figure 2 was retained.

To a large extent, the pattern of significant path coefficients between different indicators of religiosity/faith is in line with the hypothesized developmental model of the

consolidation of religious identity (Figure 1). Structural paths were gender invariant, with two exceptions. The association between personal faith and religious friends was insignificant in male ($\beta = 0.07, p = 0.359$), but moderately strong among female participants ($\beta = 0.27, p = 0.001$). In addition, the relation between religiosity and religious friends was insignificant in the female ($\beta = 0.10, p = 0.147$), but not in the male sample ($\beta = 0.16, p = 0.036$). The standard chi-square difference test confirmed that both gender differences were substantial.

*** FIGURE 2 ABOUT HERE ***

RQ1 – Which Psycho-Social Mechanism Underlie the Focal Association?

As shown in Figure 2, none of the three hypothesized mechanisms were significant in the female sample. Among men, two of the three mechanisms (paths A and C) were found statistically significant ($p < 0.001$ and $p = 0.024$, respectively), albeit of small size ($\beta = 0.23$ and $\beta = -0.19$). Unlike the pathway A, where internalization of religious morality was negatively associated with sexual risk taking, higher levels of participation in faith-based activities (i.e., pathway C) were linked to more sexual risks (this relation was also significant at bivariate level; see Table 2).

A more thorough analysis of possible psychosocial mechanisms of influence was carried out by specifying and testing multiple mediation (Blunch, 2012; Preacher & Hayes, 2008). Among female participants, only one of the four specified mediations was significant. The proportion of religious friends mediated the association between personal faith and sexual risk taking (95% CI = -0.059 - -0.003; $p = 0.026$). The finding suggested the potential importance of external motivation (path B) for understanding sexual risk taking among emerging female adults. In the male sample, two significant indirect effects were observed. Confirming the importance of the mixed motivation mechanism, participation in faith-based activities mediated the link between personal faith and sexual risk taking (95% CI = 0.041 -

0.195; $p < 0.001$), as well as the relation between religiosity and the outcome (95% CI = 0.014 - 0.090; $p < 0.001$).

RQ2 - Are the Mechanisms Gender-Specific?

Taken together, the above findings confirm gendered nature of links between religiosity/faith and sexual risk taking. Although significant findings were rare and of small effect size, the nature of the psychosocial mechanism underlying the focal association was gender-specific: External motivation was relevant for the understanding of female sexual risk taking, while mixed motivation was important for sexual risk taking in male participants. In addition, the gendered mechanisms appeared to reduce sexual risk taking in female, but increase it somewhat among male participants.

Additional Regression Analysis

To check for a possible inconsistency of the index of sexual risks, an additional multivariate logistic regression analysis was carried out with condom use at most recent anal or sexual intercourse as the outcome (the findings are not presented in tables). Controlling for parental education and place of residence, we observed no significant associations between the religiosity/faith indicators and the outcome, suggesting that all risk items were related to the religiosity/faith indicators.

DISCUSSION

Associations between young people's religiosity and personal faith on the one hand and risky sexual behavior on the other hand have been reported in a number of studies, although not all, but *how* they may be working remains less clear. The current study aimed to shed some light on possible psychosocial mechanisms underlying the associations in a population-based sample of emerging Croatian adults. To that purpose, we built a developmentally plausible model of associations between distinct facets of religiosity/faith, which enabled distinguishing among three specific pathways to sexual risk taking (Figure 1):

(A) internal motivation (internalization of moral beliefs), (B) external motivation (peer influence), and (C) and mixed motivation (collective action and identity forging) to avoid sexual risks.

Structural equation modeling with mediation testing indicated that internal and mixed motivation played an ambivalent role in male participants' sexual risk taking. In female participants, we observed a slight and indirect contribution of internalization of religious beliefs, which was mediated by the influence of religious peers. Taken together, the two findings point to the gender-specificity of underlying mechanisms.

Overall, this study's insights are in line with the literature on religiosity and sexual risk taking in young people (Koletić et al., 2021; Rostosky et al., 2004). As in most other studies, we found significant but small associations between religiosity and sexual risk taking, which differed across gender. What sets the current study apart from the literature is our exploration, limited by cross-sectional design, of underlying psychosocial mechanisms separately for each gender. The observation that moral beliefs (internalized faith) and reputation maintenance in the network of closest friends were, combined, linked to lower sexual risk taking among female but not male participants might be explained by pointing to gender-specific effects of prescriptive norms and peer pressure. Particularly in the case of adolescence and emerging adulthood, it has been observed that social regulation of sexuality, in which religious moral beliefs often play an important role, affects women's attitudes about sexuality and sexual behavior more substantially than men's (Baumeister, 2000). The maintenance of peer reputation, particularly in a sexual context, also seems to be relatively more important for young women—primarily due to (at least) psychological costs imposed by the double standard (Kreager et al., 2016; Kreager & Staff, 2009). That sex-related labeling entails higher sociocultural risks on a young woman than her male peers are likely only

amplified among religious young people whose reputation is often strongly linked to the concept of sexual purity (Adamczyk & Felson, 2006; Regnerus, 2007; Rostosky et al., 2003).

In contrast, participation in faith-based activities such as religious youth gatherings, collective prayers and spiritual seminars, was linked to sexual risk taking only among male and not female participants. Unlike personal faith, which contributed to lower levels of sexual risk taking, participation in faith-based activities was, surprisingly, positively associated with the outcome. The finding, which was consistent across bi- and multi-variate levels, is difficult to explain due to a lack of additional relevant information in the questionnaire. It is possible that the mere fact of being surrounded by peers, often away from home and the usual life circumstances, facilitates emotional and erotic connections, which may result in sexual activity. This exposure, however, may be relevant only for those emerging adult men whose sexuality is generally less restricted by their religiosity. Such interpretation is compatible with the negative link between personal faith and sexual risk taking. Another possible interpretation is that factors that contribute to involvement in faith-based activities partially coincide with factors that contribute to sexually risky behavior, for example personality dimensions such as extraversion (Hoyle et al., 2000).

This study's findings that the explored links between religiosity/faith and sexual risk taking were more notable in male compared to female participants are somewhat at odds with previous studies carried out in Croatia (Puzek et al., 2012; Štulhofer et al., 2011), in which associations were primarily observed among female and not male participants, but not an exception in the international research (Manlove et al., 2008). Although small-sized associations obtained in our study caution against drawing any conclusions, the observed "reversal" may be related to the process of growing religious identification among young people in Croatia during the past decades (Črpić & Zrinščak, 2010; Marinović Jerolimov & Jokić, 2010), which appears to be characterized not only by a quest for spirituality but also

ethno-national identification (Jakelić, 2004; Nikodem & Zrinščak, 2012). This might explain, to an extent, the surprising finding of a positive association between that male participants' religiosity/faith and sexual risk taking.

Considering that the association between religiosity/faith and sexual risk taking can be ambiguous—as indicated by the studies that observed that religiosity discouraged multiple sexual partnerships (decreasing sexual risks; (Edwards et al., 2011; Manlove et al., 2008) but also condom and contraception use (increasing sexual risks; (Moreau et al., 2013; Piper et al., 2022; Zaleski & Schiaffino, 2000)—we attempted to gain insight into which type of “effect” was associated with the proposed psychosocial mechanisms. Unfortunately, the question remains unanswered, reflecting marginally sized associations between the indicators of religiosity/faith and specific instances of sexual risks.

Study Strengths and Limitations

Among the current study's strengths, a large-scale probability-based sample, multi-item measurement of the religiosity/faith construct, and robust statistical approach should be mentioned. However, there are also a few limitations that need to be briefly discussed. The first stems from the use of a non-experimental research design which made it impossible to study the relationship of various aspects of religiosity and sexually risky behaviors isolated from possible confounding factors. In addition, the study examined hypothetical time-sequenced PSMs with cross-sectional data. Considering the non-experimental nature of our study design, our discussion of the tested PSMs should not be understood as an attempt to identify causal links between the constructs of interest, but as an empirically informed discussion about likely phenomena that underlie the relation between various aspects of religiosity/faith and risky sexual behavior in emerging Croatian adults. Although our model, we would hope, is logically coherent, clearly it cannot provide causal evidence.

Despite efforts to ensure representativeness, our sample is unlikely to fully reflect the respective population. Given the study topic, an underrepresentation of highly religious individuals is very likely. Such bias could have resulted in reduced correlations due to restricted range in the variables of interest. However, since the obtained correlations did not substantially deviate from those obtained in other studies (Koletić et al., 2021; Puzek et al., 2012), the potential bias appears negligible. In the same context, it should be noted that full generalizability—which is an essential requirement for prevalence studies—is not a necessity for studies that explore PSMs. The latter only need samples of adequate size (power issues) and heterogeneity.

Given the self-reported nature of the data on sexual risk taking, the usual limitations associated with cognitive errors and social desirability (Brener et al, 2003) apply. Although questions about religion and faith may contribute to underreporting of risky sex, this is not very likely in this case due to the fact that the two sets of questions were set far apart in the study questionnaire.

Some potentially relevant variables were not explored in the current study. Although sexual orientation has been related to sexual risk taking, the proportion of non-heterosexual participants did not allow separate statistical treatment of sexual minorities. Accordingly, we cannot rule out the possibility that the mechanisms linking religiosity and sexual risks differ between emerging non-heterosexual and heterosexual adults. We also did not assess the potential contribution of relationship status and substance abuse (Brown et al., 2016). Thus, although our findings and conclusions are valid at the population level, they may not be relevant for some specific groups.

Finally, the current study's findings are likely culture-specific (86.3% of the Croatian population identified as Roman Catholics in the 2011 census, with additional 6.8% reporting a non-religious or other identity; (Croatian Bureau of Statistics, 2018), even among countries

with similar socioeconomic and sociocultural characteristics. Social regulation of sexuality varies in function of the dominant religious tradition, as has been recognized in cross-cultural research on human sexuality (Srikanthan & Reid, 2008; Štulhofer & Rimac, 2008).

Conclusions

The proposed analysis of psychosocial mechanisms that underlie the link between emerging adults' religiosity and personal faith on the one hand and sexual risk taking on the other hand has implications for both theory- and empirically-driven research in young people's health, religiosity, and sexuality. In particular, our findings that the size of links between religiosity/faith were consistently small in emerging adults—similarly to the reports dating a decade ago (Puzek et al., 2012; Štulhofer et al., 2011)—contribute to discussions about strategies to reduce young people's vulnerability to sexual risks. Overall, the current study strongly suggests that religious upbringing, personal religiosity, and faith do not meaningfully reduce sexual and reproductive health risks and, consequently, the need for comprehensive sexuality education. However, as illustrated by the case study presented in the introduction, religion-based moral beliefs can substantially reduce chances of young people receiving such education in public schools.

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Disclosure Statement

The authors have no competing (or conflict of) interest to declare.

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Table 1

Sociodemographic and Socio-sexual Characteristics of the Sample

	Male		Female		<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
	participants		participants					
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Religiosity	3.562	1.550	3.762	1.556	-2.234	1208	0.026	0.128
Religious upbringing	4.599	1.631	4.668	1.619	-0.742	1208	0.458	0.043
Religious friends	1.533	3.340	1.268	1.284	1.801	759	0.072	0.105
Personal faith	2.974	1.139	3.215	1.124	-3.705	1208	0.000	0.213
Participation in faith-based activities	1.621	0.796	1.753	0.786	-2.908	1208	0.004	0.167
Sexual debut	17.577	2.363	18.128	2.526	-3.390	913	0.001	0.225
Sexual risk index	1.363	1.182	1.464	1.047	-1.298	764	0.195	0.090

*Bonferroni corrected *p*-value for multiple comparisons = 0.007

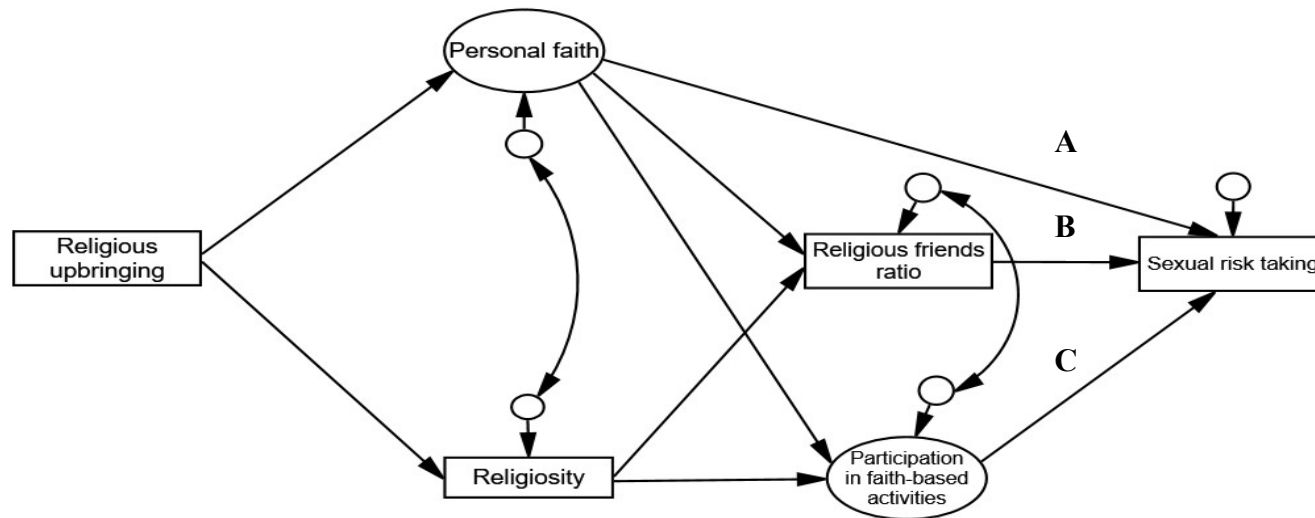
Table 2

Cross-correlations between Key Indicators by Gender

	A	B	C	D	E	F
Sexual risk index (A)	-	-.03	.00	-.04	-.05	-.02
Religiosity (B)	-.03	-	.56**	.72**	.34**	.54**
Religious upbringing (C)	.03	.54**	-	.59**	.37**	.42**
Personal faith (D)	-.07	.71**	.56**	-	.37**	.50**
Religious friends (E)	-.04	.33**	.31**	.39**	-	.26**
Participation in faith-based activities (F)	.10*	.50**	.43**	.47**	.26**	-

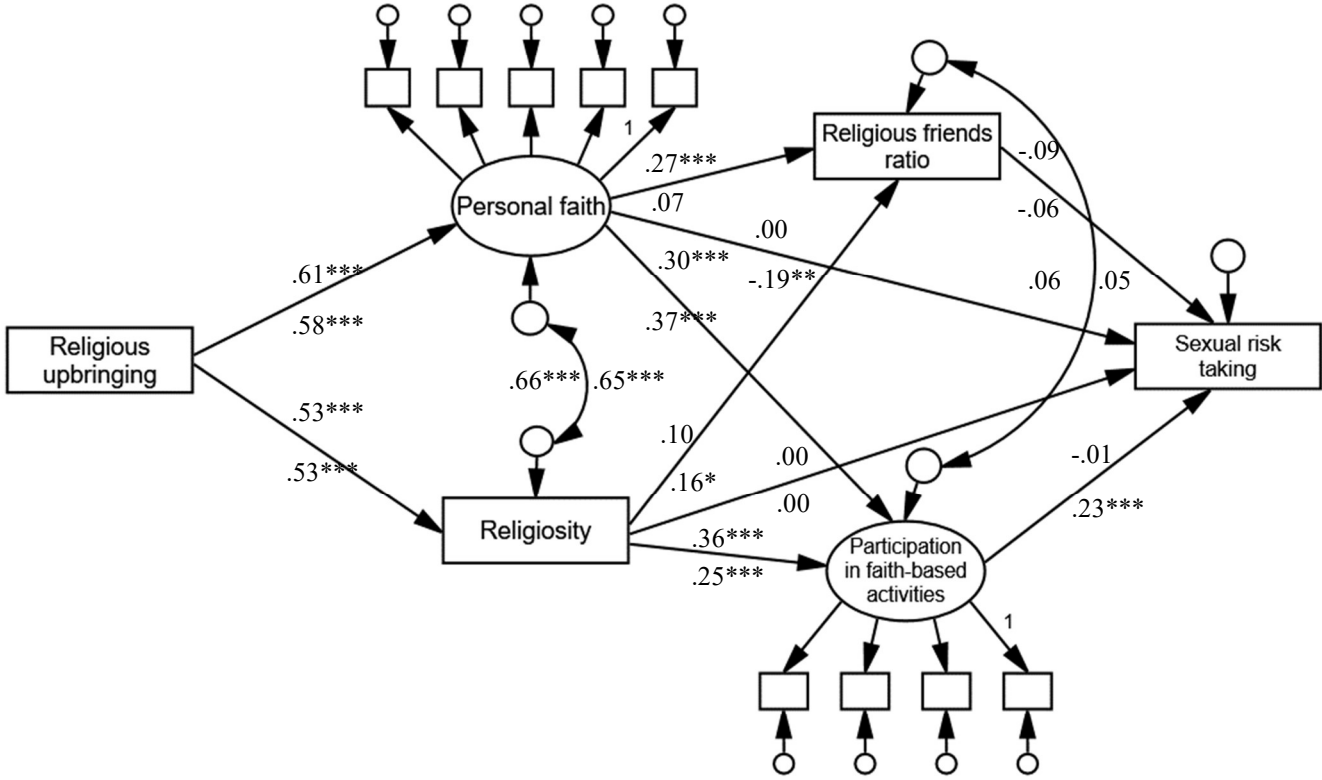
Notes. Correlation coefficients for female participants (N=609) are presented above and those for male participants (N=601) below the main diagonal; * $p < .05$, ** $p < .01$.

Figure 1 – A Developmental Model of Psychosocial Mechanisms (A, B & C) Underlying Associations between Religiosity/Faith and Sexual Risk Taking



Note. Path A = internalization of moral beliefs (internal motivation); path B = peer influence (external motivation), path C = collective identification (combination of external and internal motivation)

Figure 2 – Path Analytic Model of the Associations between Personal Faith/Religiosity and Sexual Risk Taking Scores



$\chi^2_{(129)} = 387.06, TLI = .948, CFI = .957, RMSEA = .047 (95\% CI = .042-.052)$

Notes. Standardized path coefficients in the female sample are presented above or left of arrows, while coefficients in the male sample are presented below or right of arrows; * p < 0.05, ** p < 0.01, *** p < 0.001