

Religiosity and Young Unmarried Women's Sexual and Contraceptive Behavior: New Evidence From a Longitudinal Panel of Young Adult Women

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ABSTRACT Drawing on weekly panel data from the Relationship Dynamics and Social Life study, we investigate the relationship between religiosity and young Christian women's premarital intercourse, hormonal contraceptive use, and condom use for a period of up to 2.5 years. Mediation analyses reveal what explains the relationship between baseline religiosity and young women's subsequent reproductive behaviors, with consideration for their normative environments, moral order and learned competencies, attitudes, and anticipated guilt after sex. Results indicate that the more religious a young woman is, the less likely she is to have intercourse and to use hormonal contraception in a given week. However, when having intercourse and *not* using a hormonal method, the more religious a young woman is, the more likely she is to use condoms. Religiosity's relationship to these behaviors operates largely through women's reproductive attitudes, anticipated feelings of guilt after sex, and past sexual or contraceptive behaviors. Together, these findings highlight the complex relationship between religiosity and premarital sex and contraceptive use, elucidate key pathways through which religiosity operates, and draw attention to the often overlooked role of sexual emotions.

KEYWORDS Religiosity • Premarital sex • Contraception • Transition to adulthood • Emotion

Introduction

Social scientists have long argued that religion plays an influential role in the lives of adolescents and young adults (Pearce et al. 2019; Regnerus 2007; Rostosky et al. 2004), including in the timing of sexual debut and marriage (Eggebeen and Dew 2009; Meier 2003; Rostosky et al. 2004; Uecker 2014). Nevertheless, studies assessing how *religiosity* is related to sex and contraceptive use have yielded mixed results, with some documenting a negative relationship between religiosity and contraception (Studer and Thornton 1987; Zaleski and Schiaffino 2000), others suggesting a positive one (Miller and Gur 2002; Nonnemaker et al. 2003), and still others indicating none at all (Bearman and Brückner 2001; Manlove et al. 2004).

Clarifying the relationship between religiosity, sex, and contraceptive use is critical to understanding the determinants of early and nonmarital fertility in the United States. Approximately three fourths of Americans aged 18–29 identify with some variant of Christianity, including Catholicism and Mainline and Evangelical Protestantism (Pew Research Center 2015). Thus, Christian ideology and religiosity may be relevant to the reproductive outcomes of millions of young adults, especially considering that most Christian denominations espouse “generally prohibitive sexual ideologies” (Rostosky et al. 2003:359). For example, the Catholic Church and Southern Baptists express stringent opposition to premarital sex and contraceptive use, although others such as the Presbyterian Church (U.S.A.) or the United Church of Christ tend to embrace more tolerant perspectives, mostly for married couples (Wilde 2020). While individual churches, too, vary in the extent to which their sexual and reproductive cultures parallel mainstream denominational norms (McKinnon et al. 2008; Yeatman and Trinitapoli 2008), religious Christian ideologies typically discourage sex and contraceptive use among unmarried youth (Barrett et al. 2014; Bullis and Harrigan 1992; Cochran et al. 2004; Uecker 2008).

In this study, we investigate what explains the relationship between religiosity and sexual intercourse and contraceptive use among young unmarried Christian women net of their denomination. Past studies have operationalized religiosity in various ways, including through church attendance, personal importance of religion (Studer and Thornton 1987), and frequency of prayer (Bearman and Brückner 2001), as well as through composite measures of public and private religiosity and intrinsic and extrinsic religious orientation (Nonnemaker et al. 2003; Zaleski and Schiaffino 2000). In light of these studies, which evince the multifaceted nature of religiosity, we conceptualize religiosity as the strength of religious beliefs and behavioral adherence to these beliefs. To comprehensively explore the relationship between religiosity and reproductive behavior, we leverage panel data from the Relationship Dynamics and Social Life study, which features *multidimensional* information on young women’s religiosity; comprehensive information about their past and present social environments, moral order and learned competencies, attitudes, and emotions regarding sex; and detailed, weekly information on their sexual and contraceptive behaviors. These data enable us to make three important contributions to the literature. First, we model the relationship between religiosity and premarital reproductive behaviors such that religiosity temporally *precedes* all outcomes. Second, we offer a comprehensive analysis of the channels through which religiosity operates in relation to sex and contraceptive use, elucidating a combination of social environmental and cognitive pathways (Bachrach and Morgan 2013). Third, and relatedly, we analyze a potential mediating pathway that is largely missing from demographic studies of religiosity and reproductive health, despite being implicit in many theoretical perspectives—the role of sexual guilt (for exceptions, see Rostosky et al. 2003; Uecker 2008). In this way, we expand the nascent literature on the role of underlying emotions in demographic processes (Axinn et al. 2017; Massey 2002; Rostosky et al. 2003; Uecker 2008).

Religiosity’s Pathways of Influence

Prior research indicates that religiosity should be salient to young women’s sexual and reproductive behaviors because it conveys the strength of their affiliation with a religious community and because these communities promote specific sets of

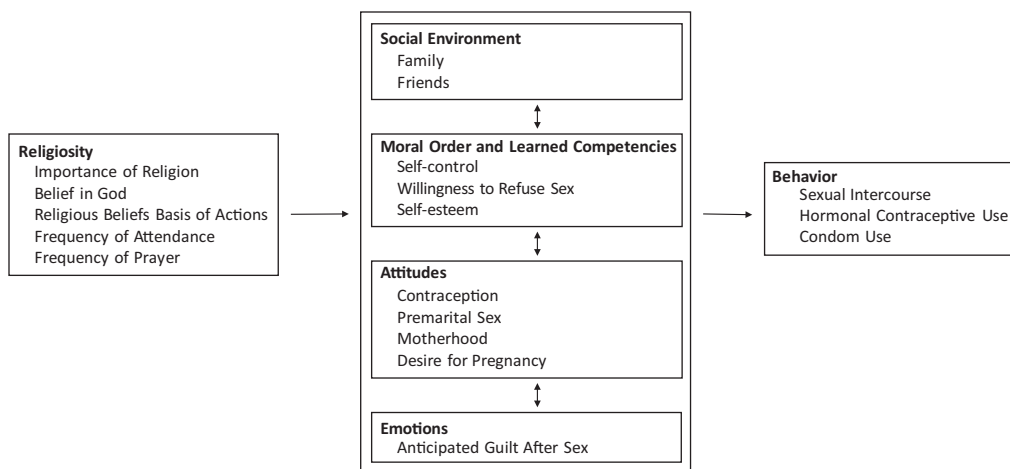


Fig. 1 Conceptual model of pathways through which religiosity may affect young unmarried women's sexual behavior and contraceptive use

fertility-related norms (McQuillan 2004).¹ Here, we offer an overview of the various pathways through which religiosity may affect young unmarried Christian women's sexual behavior and contraceptive use, as depicted in Figure 1.

We begin with social environments, which establish and reinforce social norms by offering models of normative behaviors and ideas (Bongaarts and Watkins 1996), direct time and attention toward community priorities (Tavory 2016), and regulate norm compliance through surveillance and implicit promises of approval or threats of punishment (Bongaarts and Watkins 1996; Durkheim 1951). Families represent one such social environment: young people who grow up in religious families typically have higher religiosity than young people from less religious families (Smith 2003a), in part because their parents explicitly discuss, model, and reinforce religious norms (Manlove et al. 2006; Pearce 2002; Pearce et al. 2019; Regnerus 2007; Smith 2003b). Correspondingly, young women who grow up in highly religious households are more likely than others to avoid premarital sex because they fear their parents' reactions (Sennott and Mollborn 2011) or divine punishment (Ellison and Levin 1998; Hardy and Raffaelli 2003). Religious families also tend to spend more time together than less religious families (Pearce 2002; Smith 2003a), giving parents more opportunities to supervise their children (Miller et al. 2001). Consequently, young women who grow up in religious families may adopt their parents' attitudes about sex and be less willing or able than women from less religious families to break family norms. Nevertheless, because highly religious parents tend to emphasize the immorality of sex rather than its medical implications when discussing sex with their children, religious teens sometimes engage in sexual and contraceptive behaviors that elevate their risk of unintended pregnancy and STI transmission (Regnerus 2005).

¹ McQuillan (2004) outlines three conditions under which religions influence fertility: when religions "articulate behavioral norms that have linkages to fertility outcomes," when religions have "means to communicate its teachings to its members and to enforce compliance," and when members of the religion "feel a strong sense of attachment to the religious community" (2004:49–50).

During adolescence and the transition to adulthood, peer environments become equally influential as family environments, if not more so (Arnett 2000; Mollborn 2017). Among teenagers, the average level of friends' religiosity is almost as predictive of sexual debut and activity as one's own level of religiosity (Adamczyk 2009; Adamczyk and Felson 2006). Although peer groups evolve as young adults enter new institutional settings (Arnett 2000; Sennott and Mollborn 2011), highly religious young women may gravitate toward highly religious peers because people tend to be attracted to others who are like them (Goodreau et al. 2009). If they do not, choosing which social norms to follow—their families' or their friends'—will reflect the perceived consequences of breaking each group's norms (Liefbroer and Billari 2010) and their chances of being discovered when doing so (Hamilton and Armstrong 2009; Studer and Thornton 1987).

Another pathway by which religiosity may operate is through the transmission of moral order and learned competencies (Smith 2003b). Christian moral order—or the Christian social mores and directives relating to morality—tend to promote self-control and virtue, which may guide some religious young women's behaviors (Smith 2003b). Involvement in religion can also impart competencies that empower a young person to adhere to moral orders by enhancing skills and knowledge that improve well-being, discipline, or self-efficacy in various domains. That is, Christian norms and the social environments that reinforce them often encourage individuals to exert self-control or delay gratification to do what is "right" (Smith 2003b). Developing this self-control may enable religious young women to consistently avoid sex and, therefore, to not need contraception. Abstinence-only sex education, which focuses on sexual refusal and associated risks of sex, reinforces messages about self-control (Haglund and Fehring 2010). Some moral orders or competencies, however, can be detrimental to young women's sexual and reproductive health: for instance, submissiveness reduces girls' sense of sexual agency and ability to refuse unwanted sex (Miller and Gur 2002).

Religiosity may also affect fertility-related attitudes (Bachrach and Morgan 2013; Shah et al. 2016). Because Christianity promotes prohibitive sexual ideologies (to varying degrees across denominations and churches), highly religious Christian women should be more morally opposed to nonmarital sex and contraceptive use than their less religious peers (Rostosky et al. 2003; Thornton and Camburn 1987). These attitudes themselves are associated with women's sexual behavior and contraceptive use (Guzzo et al. 2019; Meier 2003; Ryan et al. 2007) and may explain religiosity's relationship to them. At the same time, Christianity's emphasis on pronatalism and the importance of family may lead some religious women to view motherhood as a unique opportunity for personal fulfillment in a way that also affects their reproductive behavior (Davis and Greenstein 2009). Nevertheless, because nonmarital pregnancies evince nonmarital sexual activity, highly religious unmarried young women are typically less desirous of pregnancy than are their less religious peers (Weitzman et al. 2017).

Another channel through which religiosity may operate is women's anticipated emotions about sex. Norm deviance tends to elicit negative emotions, such as guilt, embarrassment, and disgust (Goffman 1982; Rozin et al. 2008). Guilt, which is considered a negative, moral emotion (Haidt 2003), typically motivates individuals to change their behavior to reposition themselves to maintain group interests and norms (Hermann et al. 2015). Both external group pressure and internal motivation can yield

a less permissive sexual disposition (Mollborn 2017; Mosher 1968; Mosher and Cross 1971) and reduce the likelihood of engaging in sexual activity (Emmers-Sommer et al. 2018). Guilt, as part of a group of negative emotional consequences of sex, is one of the means by which religiosity indirectly influences sexual behavior (Rostosky et al. 2003). Among those who are sexually active, women who associate sex with feelings of guilt tend to use less effective methods of contraception (Adler 1984; Mosher and Vonderheide 1985), use those methods less effectively (Adler 1984; Mosher and Vonderheide 1985), and take longer to use a reliable method once sexually active (Allgeier et al. 1977).

Religiosity and Reproductive Decision-making

Although there are many reasons why religiosity may induce behaviors that align with religious norms, it is also possible that religiosity may motivate women to attempt to hide behaviors that do *not* align with these norms. For instance, because nonmarital pregnancies threaten to reveal “immoral” sexual behavior to other community members, highly religious Christian women who engage in nonmarital sex may opt to use hormonal contraception to avoid pregnancy. We refer to paradoxes like this as “contraceptive work-arounds.” Although Christian norms discourage contraceptive use, at least in some communities (Uecker 2008; Wilde 2020), contraception offers women a way to conceal their stigmatized, nonmarital sexual activity from others. At least one study finds that among adolescents, the more frequently a woman attends religious services, the greater she perceives her risk of pregnancy to be; the more she associates pregnancy with suffering; and correspondingly, the more likely she is to plan to use birth control (Miller and Gur 2002).

The notion of contraceptive work-arounds assumes that decisions about sex and contraceptive use are made in relation to each other. For a religious young woman, her social environment, moral order and learned competencies, moral attitudes, and anticipated sexual guilt will likely discourage nonmarital sex (Adamczyk 2009; Adamczyk and Felson 2006; Emmers-Sommer et al. 2018; Guzzo et al. 2019; Manlove et al. 2006; Meier 2003; Mollborn 2017; Pearce et al. 2019; Sennott and Mollborn 2011; Smith 2003b). If so, then religiosity should be negatively associated with nonmarital sex and this association should be explained, in large part, by social factors. While hormonal contraceptives help protect against nonmarital pregnancies that could reveal nonmarital sexual activity, young women may nonetheless be less likely to use these methods when they are more religious because of their typically stronger moral opposition to them (Studer and Thornton 1987) or lower anticipation of sex. Moreover, using hormonal contraception requires medical consultation and visits to pharmacies—steps that potentially expose a woman's sex life and contraceptive use to other community members and that may be especially cognitively demanding if she is morally opposed to premarital sex and contraception. Thus, religiosity may relate to hormonal contraceptive use *vis-à-vis* a young woman's moral beliefs, perceived ability to regulate her sexual behavior, social norms, and anticipated feelings of guilt (Grady et al. 1993; Mosher and Vonderheide 1985; Studer and Thornton 1987). If high religiosity leads young unmarried women to prioritize religious norms

against contraception, then religiosity should be negatively associated with hormonal contraception. On the other hand, if high religiosity leads young unmarried women to prioritize the *appearance* of religious adherence because they fear being stigmatized for having premarital sex or pregnancies, then religiosity may be positively associated with using hormonal contraception.

Contraceptive work-arounds are not necessarily limited to hormonal methods, but may include condoms as well, particularly when highly religious unmarried women have sex but do *not* use hormonal contraception. When not using hormonal contraception, sexually active young women must choose between either accepting that their sexual activity could result in a premarital pregnancy or relying on condoms to prevent such a pregnancy. If highly religious young unmarried women prioritize their moral order, then they should be less likely to use condoms than their less religious peers, even when not using hormonal contraception. On the other hand, if they prioritize a fear of social stigmatization, then they should be more likely to use condoms than less religious unmarried young women.

Data and Methods

Data

We draw on a sample of women aged 18–19 at baseline from the Relationship Dynamics and Social Life study (RDSL) (Barber et al. 2016). Participants were randomly selected from a database of driver's licenses and state identification cards in Genesee County, Michigan. Although geographically limited, the RDSL sample—which is 75% Christian, 4% other faiths, and 21% unaffiliated—is similar to the young adult population of the United States as a whole (see Pew Research Center (2015) for more details). It is also consistent with national averages among women of the same age in terms of high school and postsecondary school enrollment, employment rates, marriage, and residential arrangements (Clark 2018).

The RDSL began with a 60-minute baseline interview, conducted between March 2008 and July 2009, which gathered information on respondents' perceived norms, attitudes, self-efficacy, anticipated sexual guilt, and demographic background. Upon completion, respondents were invited to answer five-minute, weekly “journal” surveys by phone or online for the next 2.5 years. Journal collection concluded in January 2012. These surveys collected weekly information on sexual activity, contraceptive use, pregnancy status, and relationship dynamics and updated information on respondents' attitudes and perceived norms every 12 weeks. Seventy-eight percent of respondents completed weekly surveys for at least 1.5 years, and 63% completed them for the full 2.5 years (Barber et al. 2016). A randomized experiment implemented alongside the RDSL indicated that repeatedly taking these surveys had, in most cases, a negligible effect on women's behavioral and psychological outcomes (Barber et al. 2012).

Given our emphasis on the relationship between Christian religiosity and premarital sex and contraceptive use, we restrict our sample to women who completed at least two weekly surveys and reported a Christian religious denomination. Among those, we further restrict our analysis to weeks when they were not married or pregnant, which resulted in an analytic sample of 39,806 person-weeks across 680 women.

Measures

Intercourse and Contraceptive Use

Each week, respondents were asked if they were in any kind of relationship, including casual relationships. When they reported being in a relationship, they were further asked whether they had vaginal intercourse that week. *Sexual intercourse* is coded 1 in weeks when respondents reported vaginal sex and 0 in weeks when they did not (including when not in a relationship). Respondents had intercourse in 29% of weeks (univariate analysis not shown).

Regardless of their sexual activity, women were asked each week if they had used or done anything “that can help people avoid becoming pregnant.” When respondents answered “yes,” they were asked whether they used specific hormonal methods, including birth control pills, the patch, the ring, the contraceptive shot (i.e., the injectable), the implant, or an IUD (separately). We code *hormonal use* as 1 in weeks when women reported using at least one of these methods and 0 when they did not. Respondents used hormonal contraception in 32% of weeks (analyses not shown).²

In weeks when women reported having sex, they were also asked about their use of coital contraceptive methods. *Condom use* is coded 1 in weeks when respondents reported using male condoms and 0 when they did not. Women used condoms in 42% of the weeks they had intercourse and in 23% of the weeks they specifically had intercourse but did not use a hormonal method (analyses not shown).

Religiosity and Religion

Our main predictor of interest is *religiosity*, which is based on five questions asked at baseline about the importance of religious faith to respondents; intensity of beliefs in God and in using religious beliefs as a basis for action (separately); and frequencies of service attendance and praying alone (separately). These items had high interreliability, with a Cronbach's alpha of .80. Individual items had possible response ranges of 1–4, 1–5, or 1–6, respectively. Therefore, we operationalize *religiosity* as the mean across responses to all five questions. Overall, the sample was quite religious, with an average religiosity of 3.71 and a mode of 4 (Figure 2).

To account for denominational variation, we also control for Christian *denomination*, which was assessed at baseline as Catholic, Baptist, Lutheran, Methodist, Evangelical, Pentecostal, Protestant, and other Christian.

Family and Friend Environment

We include five indicators of respondents' family environment. First, *parents' approval of sex* was assessed every 12 weeks with the question “How would your parents react if they found out that you had sexual intercourse?” Possible responses were based on a

² Women used long-acting reversible forms of contraception—IUDs and implants—in only 3.7% of weeks ($n = 1,468$).

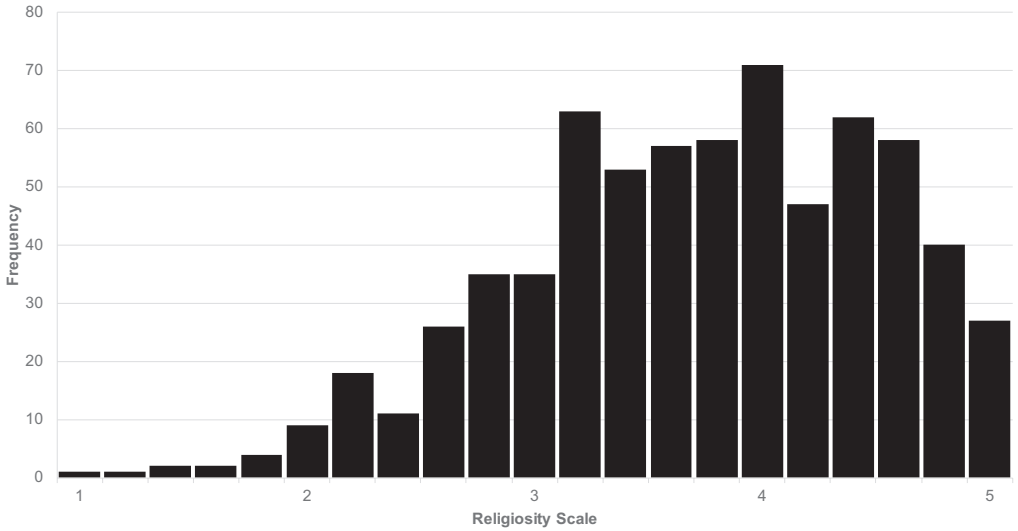


Fig. 2 Frequency of religiosity level of young unmarried Christian women

0–5 scale ranging from “not at all positively” to “extremely positively.” Second, how often *parents were home after school* is based on a 1–5 scale ranging from “never” to “always.” The third and fourth indicators are dichotomous measures of whether a woman grew up in a *two-parent household* and *lived with a parent at baseline*. Fifth, *number of sex topics covered by parents* is an additive scale based on five yes or no questions about whether a woman’s parents talked to her about how to say no to sex, methods of birth control, where to get birth control, sexually transmitted diseases, and how to use a condom; the scale has a range of 0–5 and a Cronbach’s alpha of .80. These last four family indicators were assessed once at baseline.

Perceived norms among friends were reassessed every 12 weeks. Measures include *friends’ approval of sex*, measured in the same way as parents’ approval; whether *many or all of her friends are having sex*, versus none or a few; and *friends’ approval of sex without birth control*, based on a 0–5 scale, with higher values indicating greater approval.

Moral Order and Learned Competencies

We operationalize moral order and learned competencies (Smith 2003b) with three measures. First is the extent to which a woman believed she could *stop herself if aroused*, which was assessed every 12 weeks by asking “What are the chances that you could stop yourself [from having sex] once you were highly aroused or turned on?” Original responses ranged from 0 to 100, which we divide into quartiles for the ease of interpretation. The second is a woman’s *willingness to refuse sex*, “even if it made [her partner] angry,” which was also assessed every 12 weeks, with possible answers on a 0–5 scale ranging from “not at all” to “extremely.” Third is a woman’s

self-esteem, which we create by taking the mean of four items assessed at baseline. These items convey how much a woman reported being satisfied with herself, taking a positive attitude toward herself, not having much to be proud of (reverse-coded), and feeling like a failure (reverse-coded). This measure ranged from 0 to 4, with higher numbers indicating higher self-esteem.

Attitudes and Emotions

We assess how much a woman believes that *birth control is "morally wrong"* and that *birth control "takes too much planning ahead of time"* (both on a 0–4 scale), and how much a woman *disapproves of premarital sex* and believes that *motherhood is the "most fulfilling role"* a woman can have in life (both on a 1–5 scale). Each of these attitudes was assessed every 12 weeks with responses ranging from "strongly disagree" to "strongly agree." We also include a weekly measure of *desire for pregnancy*, reflecting how much respondents wanted to get pregnant in the next month, based on a 0–5 scale from "not at all" to "extremely."

At baseline, respondents were asked how much they agreed with the statement "If you had sexual intercourse now, you would feel guilty." *Anticipated guilt after sex* was based on responses to this question, based on a 1–5 scale ranging from "strongly disagree" to "strongly agree." The RDSL did not include additional questions about anticipated emotions regarding sex.

Controls

All multivariable models control for whether a woman identified as *Black*,³ her *age* (updated weekly), whether her *mother was a teenage mom* (assessed at baseline), her *mother's education* (some college or less vs. completed college, assessed at baseline), a woman's *relationship status* (no relationship, engaged, or special relationship), *relationship duration* (in weeks) (these last two measures updated weekly), and whether she was currently *enrolled in college* (updated every 12 weeks). [Table 1](#) presents relationship status as the proportion of weeks in no relationship, engaged, or in a special relationship, and the average relationship duration (regardless of type). It also presents the proportion of weeks enrolled in college.

Methods

We begin by providing descriptive statistics separately for women with low, average, and high religiosity, defined as greater than one standard deviation below, within one standard deviation of, and greater than one standard deviation above the mean. To more formally assess differences between groups, we couple these descriptive analyses with bivariate models estimated at the woman or week level.

³ Ninety-seven percent of respondents identified as Black or White.

Next, we analyze relationships between religiosity and whether a woman had sexual intercourse in a given week and reported contraceptive use in a given week, and formally assess what explains these relationships using seemingly unrelated regressions with bootstrapped standard errors (100 replications). An important benefit of this approach is that it allows us to estimate both the individual and the cumulative indirect effects of our proposed mediators. For example, our models provide estimates of how much of religiosity's effect is explained by each individual attitude a woman espouses and how much of its effect is explained by her reproductive attitudes overall as a group. Beyond estimating these indirect effects, seemingly unrelated regressions estimate religiosity's direct effect net of the mediators included in the model. Summing religiosity's *direct* effect and its *indirect* effect that operates through the mediators provides an estimate of religiosity's *total* effect. From this, we can calculate the proportion of religiosity's total effect that is explained by the mediators by dividing mediators' combined indirect effect by religiosity's total effect.⁴

For each outcome, we estimate six models. The first is a base model that examines the direct effect of religiosity net of only denomination and other demographic controls. This base model elucidates religiosity's estimated effect on whether a woman had had sexual intercourse that week, hormonal use that week, and condom use that week prior to adjusting for any proposed mechanisms. The next five models introduce different sets of mediators into the model separately: family environment, friend environment, moral order and learned competencies, attitudes, and emotions. We introduce each set of mediators in a separate model to avoid making assumptions about the order in which mechanisms unfold.⁵ Because of the skewed sampling distribution of the product of coefficients in seemingly unrelated regressions, statistical significance in seemingly unrelated regressions is based on nonsymmetric, bias-corrected, and accelerated confidence intervals (Preacher and Hayes 2008).

Results

How Do Highly Religious and Less Religious Women Differ?

Descriptions of women with low, average, and high religiosity are provided in [Table 1](#), along with the results of bivariate analyses formally comparing these subsamples. Highly religious women had sex in just 16% of weeks—approximately half as frequently as others. Likewise, highly religious women used hormonal methods in just 17% of weeks, approximately half and two fifths as often as average and less religious women did, respectively. Yet highly religious women used condoms in 34% of weeks when they had sex and were not using hormonal contraception, which was significantly more often than women with average or low religiosity.

⁴ We multiply the proportion by 100.

⁵ Because some mechanisms may be interdependent but are explored in separate models, the total proportion of religiosity's effect that is mediated across models may sum to more than 1 or more than 100%.

Table 1 Descriptive statistics for young unmarried Christian women with low, average, and high religiosity and the results of bivariate analyses comparing cross-group differences, Relationship Dynamics and Social Life study

Variable	Low Religiosity (n = 109)		Average Religiosity (n = 446)		High Religiosity (n = 125)		Low vs. Average	Low vs. High	Average vs. High
	Mean/%	SD	Mean/%	SD	Mean/%	SD			
Dependent Variables									
Had sexual intercourse this week ^a	.34		.32		.16		*	***	***
Used a hormonal method this week ^a	.43		.34		.17		***	***	***
Used a condom (only) this week ^b	.22		.22		.34		***	***	***
Religiosity and Religion									
Religiosity (range, 1–5)	2.43	0.39	3.74	0.44	4.75	0.16	***	***	***
Denomination									
Catholic	.39		.24		.08		**	***	***
Baptist	.17		.21		.25				
Lutheran	.03		.04		.02				
Methodist	.06		.05		.02				
Evangelical	.02		.02		.06				*
Pentecostal	.01		.03		.14			***	***
Protestant	.06		.08		.06				
Other Christian (ref.)	.27		.33		.38			†	
Family Social Environment									
Parent's approval of sex (range, 0–5)	1.94	1.38	1.38	1.38	1.19	1.41	**	***	
Parents at home after school (range, 1–5)	3.82	1.26	4.06	1.15	4.06	1.22	*		
Two-parent household	.62		.53		.54		†		
Lived with parent at baseline	.71		.64		.78				**
Number of sex topics covered by parents (range, 0–5)	2.93	1.82	2.99	1.77	2.96	1.77			

Table 1 (continued)

Variable	Low Religiosity (n=109)		Average Religiosity (n=446)		High Religiosity (n=125)		Low vs. Average	Low vs. High	Average vs. High
	Mean/%	SD	Mean/%	SD	Mean/%	SD			
Friend Social Environment									
Friend's approval of sex (range, 0–5)	2.92	1.42	2.70	1.40	2.18	1.61		*	**
Many or all friends are having sex	.79		.76		.58			**	***
Friend's approval of sex without birth control (range, 0–5)	1.65	1.53	1.56	1.49	1.26	1.53		**	*
Moral Order and Learned Competencies									
Stop herself if aroused (range, 0–3)	2.09	1.12	2.07	1.08	2.19	1.00			†
Willingness to refuse sex (range, 0–5)	4.23	1.48	4.05	1.64	4.08	1.76			
Self-esteem (range, 0–4)	3.16	0.54	3.25	0.49	3.25	0.69			
Attitudes									
Birth control is morally wrong (range, 0–4)	0.58	0.51	0.73	0.66	1.04	0.94		***	***
Birth control takes too much planning (range, 0–4)	0.76	0.61	0.82	0.62	0.87	0.76			
Disapproves of premarital sex (range, 1–5)	2.66	1.05	3.30	1.16	4.21	0.95	***	***	***
Motherhood is most fulfilling role (range, 1–5)	3.67	1.06	3.79	1.08	4.06	0.86		*	†
Desire for pregnancy (range, 0–5)	0.20	0.74	0.22	0.84	0.22	0.89			
Emotions									
Anticipated guilt after sex (range, 1–5)	2.27	0.96	2.62	1.13	3.51	1.23	*	***	***
Controls									
Black	.09		.41		.55		***	***	**
Age	19.23	0.72	19.23	0.59	19.27	0.60			
Mother was teenage mom	.28		.36		.32				†
Mother had some college or less	.81		.76		.71				

Table 1 (continued)

Variable	Low Religiosity (n=109)		Average Religiosity (n=446)		High Religiosity (n=125)		Low vs. Average	Low vs. High	Average vs. High
	Mean/%	SD	Mean/%	SD	Mean/%	SD			
Proportion of weeks in no relationship ^a	.47	.50	.44	.50	.52	.50	***	***	***
Proportion of weeks engaged ^b	.09	.29	.09	.28	.09	.29			
Proportion of weeks in a special relationship ^a	.44	.50	.47	.50	.39	.49	***	***	***
Average relationship duration (weeks)	88.65	96.22	76.26	73.97	90.34	90.09	***	***	***
Proportion of weeks enrolled in college ^b	.68	.47	.77	.42	.82	.38	***	***	***

Notes: Low religiosity is defined as more than one standard deviation below the mean level of religiosity among all women in the analytic sample, average religiosity is defined as within one standard deviation of the mean, and high religiosity is defined as more than one standard deviation above the mean. Bivariate analyses of categorical measures are estimated with chi-square tests; bivariate analyses of continuous measures are estimated with *t* tests.

^aComparison tests were conducted at the person-week level with the following sample sizes: low religiosity, 6,357 weeks; average religiosity, 25,551 weeks; and high religiosity, 7,898 weeks.

^bBecause condom use is determined only for weeks in which a woman had sex, the number of weeks for which tests were conducted was smaller: low religiosity, 2,129 weeks; average religiosity, 8,243 weeks; and high religiosity, 1,253 weeks.

p* < .10; *p* < .05; ****p* < .01; *****p* < .001

Women with high religiosity were nearly twice as religious as women with low religiosity (4.75 vs. 2.43) and were also significantly more religious than those with average religiosity (3.74). Women with differing levels of religiosity also varied with respect to denomination: the two most common denominations among highly religious women were other Christian and Baptist, which together accounted for nearly two thirds of this religious subsample.⁶ Although other Christians and Baptists represented a similar share of the subsample who had average religiosity, another 24% of this group were Catholic, which was substantially greater than the proportion among highly religious women. Among the least religious women, the most common denomination was Catholicism, accounting for 39%.

In terms of familial differences, women with low religiosity perceived their parents to be significantly more approving of sex than did other women. Women with low religiosity also reported that their parents were home after school significantly less frequently than did women with average religiosity ($p < .05$), but were only slightly more likely to grow up in a two-parent household than such women ($p < .10$). Highly religious women were significantly more likely to live with their parents at baseline than were women with average religiosity. Across religiosity levels, parents talked to young women about an equivalent number of sex topics. Thus, if religiosity affects premarital sex and contraceptive use through familial environments, it is likely to do so through parental approval and monitoring, rather than through their role modeling or direct communication.

In regards to friends, highly religious women were significantly less likely than other women to perceive their friends as approving of sex, with or without birth control, and were significantly less likely to perceive that many or all of their friends were having sex.

In terms of moral order and learned competencies, highly religious women were slightly more willing to refuse unwanted sex than women with average religiosity, although this difference was only marginally significant ($p < .10$). No other differences in moral order and learned competencies were observed. Thus, these are unlikely to be a primary pathway through which religiosity affects young women's sexual behavior and contraceptive use.

Women's attitudes also varied by religiosity. Most notably, moral opposition to birth control and disapproval of premarital sex increased monotonically across women with low, average, and high religiosity. Women did not differ significantly in how much planning they perceive birth control requires. Compared with other women, highly religious women viewed motherhood as the most fulfilling role. Young women's desire for pregnancy did not significantly differ by their religiosity.

Women's anticipated guilt after having sex increased monotonically with religiosity, and highly religious women anticipated approximately 55% more agreement with feeling guilty than did women with low religiosity. Therefore, anticipated sexual guilt may play a role in the relationship between religiosity and premarital sex and contraceptive use.

The samples also differed on a several control variables. The average and highly religious samples had significantly more Black women than the low religiosity sample

⁶ Estimated effects of denomination should be considered in light of small sample sizes for select groups.

($p < .001$). Additionally, highly religious women spent more weeks not in a relationship than less religious women, and less religious women spent more weeks in special relationships than more religious women (all $p < .001$). Lastly, while all women spent a majority of the weeks in the survey enrolled in college, more religious women spent more weeks enrolled (all $p < .001$).

What Mediates the Effect of Religiosity on Premarital Intercourse?

Having demonstrated meaningful differences in the social environments, attitudes, and anticipated sexual guilt of women by level of religiosity, we next investigate which if any of these mediates the effect of religiosity—measured continuously—on sexual intercourse among young unmarried Christian women. Our base model estimates the association between religiosity and a woman's probability of having intercourse in a given week net of only her denomination and demographic background (Table 2, left panel). In this model, religiosity is a strong negative predictor of sexual intercourse. For each one-unit increase in religiosity, a young woman's probability of having sex in a given week decreases by 6.3 percentage points.

In the second model, we adjust for women's family environment. When doing so, 19% of religiosity's total effect is mediated through these indicators and the estimated direct effect of religiosity is reduced to five percentage points. Of the family environment indicators, however, only parents' approval of sex has a large and strong indirect effect, explaining 1.1 of religiosity's total -6.3 percentage-point effect on intercourse (in the base model). Living with parents at baseline is also a significant mediator of religiosity, but the magnitude of its indirect effect is much smaller (0.1 percentage points). Thus, residing with parents plays only a minor explanatory role. Neither the regularity of parents being home after school nor whether a young woman grew up in a two-parent household has a significant indirect effect on her sexual activity.

Controlling for women's friend environment in the third model explains approximately 40% of religiosity's total effect on the probability of intercourse and reduces religiosity's direct effect to -3.7 percentage points. Here, mediation largely operates through friends' approval of sex and believing that many or all friends are having sex (versus not), which respectively explain 1.1 and 1.3 percentage points of religiosity's overall effect. Although statistically significant, friends' approval of sex without birth control explains only a modest amount (0.1 percentage points).

When adjusting for women's moral order and learned competencies in the fourth model, religiosity's direct effect is not mediated. Thus, moral order and learned competencies do not explain a significant portion of religiosity's association with young women's sexual activity.

Adjusting for young women's attitudes in the fifth model explains 45% of religiosity's overall effect on their probability of intercourse in a given week and attenuates religiosity's direct effect on intercourse to -3.4 percentage points. Attitudes' mediating effect primarily operates through women's disapproval of premarital sex, which accounts for 2.8 percentage points of religiosity's total effect. A small amount (0.2 percentage points) of religiosity's total effect is also explained by the level of women's pregnancy desire. The strength of their belief that motherhood is the most fulfilling role a woman can have in life has an indirect effect that runs counter to that

Table 2 Results of formal mediation analysis estimated with seemingly unrelated regressions with bootstrapped standard errors

	Sexual Intercourse (N=39,806 weeks)			Hormonal Use (N=40,433 weeks)			Condom Only (N=11,645 weeks)		
	β	SE	Sig.	β	SE	Sig.	β	SE	Sig.
Base Model									
Religiosity's direct effect	-.063	0.003	***	-.086	0.003	***	.018	0.005	***
Family Environment Mediators									
Parents' approval of sex	-.011	0.001	***	-.012	0.001	**	.002	0.001	***
Parents at home after school	.000	0.000		.000	0.000		.000	0.000	
Two-parent household	.000	0.000		.003	0.000	***	.001	0.000	
Lived with parent at baseline	-.001	0.000	**	.000	0.000		.001	0.000	
Number of sex topics covered by parents	.000	0.000	**	-.002	0.000	***	.000	0.000	
Total indirect effect (through mediators)	-.012	0.001	***	-.010	0.001	***	.004	0.001	***
Religiosity's direct effect	-.050	0.002	***	-.076	0.003	***	.014	0.005	**
Friend Environment Mediators									
Friends' approval of sex	-.011	0.001	***	-.015	0.001	***	.001	0.000	**
Many or all friends are having sex	-.013	0.001	***	-.010	0.001	***	.001	0.000	
Friends' approval of sex without birth control	-.001	0.000	***	.004	0.000	***	.000	0.000	
Total indirect effect (through mediators)	-.025	0.001	***	-.020	0.001	***	.002	0.001	***
Religiosity's direct effect	-.037	0.003	***	-.065	0.003	***	.016	0.006	**
Moral Order and Learned Competency Mediators									
Stop herself if aroused	.000	0.000		.000	0.000		.000	0.000	†
Willingness to refuse sex	.000	0.000		.000	0.000	*	.001	0.000	*
Self-esteem	.000	0.000		.003	0.000	***	-.001	0.000	**
Total indirect effect (through mediators)	.000	0.000		.003	0.000	***	-.001	0.000	***
Religiosity's direct effect	-.063	0.003	***	-.089	0.003	***	.019	0.005	***

Table 2 (continued)

	Sexual Intercourse (N=39,806 weeks)			Hormonal Use (N=40,433 weeks)			Condom Only (N=11,645 weeks)		
	β	SE	Sig.	β	SE	Sig.	β	SE	Sig.
Attitude Mediators									
Birth control is morally wrong	-.001	0.001	**	-.016	0.001	***	.008	0.001	***
Birth control takes too much planning	.000	0.000	***	-.005	0.000	***	.003	0.001	***
Disapproves of premarital sex	-.028	0.001	***	-.033	0.001	***	.010	0.002	***
Motherhood is most fulfilling role	.004	0.000	***	.002	0.000	***	.000	0.000	*
Desire for pregnancy	-.002	0.000	***	.002	0.000	***	.001	0.000	***
Total indirect effect (through mediators)	-.028	0.001	***	-.051	0.002	***	.022	0.002	***
Religiosity's direct effect	-.034	0.003	***	-.035	0.004	***	-.004	0.007	***
Emotion Mediators									
Anticipated guilt after sex	-.036	0.001	***	-.031	0.001	***	.012	0.002	***
Total indirect effect (through mediators)	-.036	0.001	***	-.031	0.001	***	.012	0.002	***
Religiosity's direct effect	-.026	0.003	***	-.055	0.003	***	.006	0.006	***

Notes: Condom use is estimated in weeks when women are not using hormonal contraception. All models adjust for denomination and the full set of controls listed in Table 1 and use 100 bootstrap replications and bias-corrected and accelerated confidence intervals. Predictors are lagged by one week.

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

of the others. This is because religiosity is positively associated with this belief, as illustrated in Table 1, and this belief is positively associated with intercourse (bivariate analyses not shown). Young women's beliefs that birth control is morally wrong and requires too much planning are not significant mediators of religiosity's effect on intercourse. Thus, religiosity's association with young unmarried Christian women's sexual activity operates in part through their attitudes about sex, pregnancy, and motherhood, but not through their attitudes about birth control.

Adjusting for anticipated guilt after sex in the last model mediates 58% of religiosity's overall effect on young women's sexual activity and attenuates religiosity's direct effect to -2.6 percentage points. Anticipated guilt after sex is thus a strong mediator of religiosity's relationship to young Christian women's premarital sexual activity.

The results of our first set of analyses thus indicate that religiosity is a significant negative predictor of young unmarried women's *subsequent* sexual activity. Further, this relationship is partially explained by a woman's family and friend environments, attitudes, and anticipated guilt after sex.

What Mediates the Effect of Religiosity on Hormonal Contraceptive Use?

Turning to the middle panel of Table 2, we next show the results of mediation analyses exploring the relationship between young women's religiosity and their premarital hormonal contraceptive use. The first model again estimates the direct effect of religiosity net of only denomination and demographic controls. As can be seen in the top row, for each one-unit increase in her religiosity, a young unmarried Christian woman is 8.6 percentage points less likely to use hormonal contraception in a given week.

Adjusting for the family environment in the second model accounts for 12% of religiosity's total effect and reduces religiosity's estimated direct effect to -7.6 percentage points. Of the individual mechanistic indicators in this set, parents' approval of sex has a strong indirect effect of -1.2 percentage points. The number of sex topics covered by parents and growing up in a two-parent household have small but opposite indirect effects of -0.2 and 0.3 , respectively. Meanwhile, the regularity with which a woman's parents were home after school and living with a parent at baseline do not have significant indirect effects on hormonal use. Thus, when it comes to the family environment, religiosity's association with hormonal use primarily operates through parents' approval of sex, rather than through their relationship modeling or monitoring.

Next, we consider the role of young women's friend environment. These mediators account for 24% of religiosity's total effect and reduce its estimated direct effect to -6.5 percentage points. Friends' approval of sex and believing that many or all friends are having sex explain 1.5 and 1.0 percentage points, respectively, of religiosity's association with hormonal use. These indirect effects, however, are slightly counteracted by friends' approval of sex without birth control, which shares an opposite (i.e., positive) indirect effect with hormonal use.

In the fourth model, moral order and competencies have a small indirect effect of 0.3 percentage points and account for just 4% of religiosity's total effect. Thus,

these are not a prime pathway through which religiosity relates to young women's hormonal use.

When respondents' attitudes are included in the fifth model, these attitudes account for 60% of religiosity's total effect on hormonal use and religiosity's estimated direct effect is reduced to -3.5 percentage points. The largest attitudinal mediator is disapproval of premarital sex, which explains 3.3 percentage points of religiosity's total effect on hormonal use. Beliefs about birth control being morally wrong and taking too much planning, however, are also significant mediators: these beliefs explain 1.6 and 0.5 percentage points of religiosity's total effect, respectively. Attitudes about motherhood and pregnancy are also significant, but their indirect effects are small and in the opposite direction from others. Thus, with respect to attitudinal pathways, religiosity's negative relationship to hormonal use is more attributable to differences in highly and less religious young women's attitudes about sex and contraceptive use than to differences in their attitudes toward motherhood and pregnancy.

With the inclusion of anticipated guilt after sex, in the last model, the estimated direct effect of religiosity is reduced to -5.5 percentage points. This attenuation reflects that anticipated guilt has an indirect effect of 3.1 percentage points and, accordingly, accounts for 36% of religiosity's total effect. Anticipated guilt after sex is thus an important pathway through which religiosity's relationship to hormonal contraceptive use operates.

To summarize, religiosity shares a significant, negative relationship with young unmarried Christian women's subsequent hormonal contraceptive use. Each of our proposed mechanistic pathways partially explains this relationship. Reproductive attitudes possess the largest explanatory power, although anticipated sexual guilt, too, explains sizable portions of religiosity's relationship to hormonal use. Family and friend environments and moral order and learned competencies explain modest portions.

What Mediates the Effect of Religiosity on Condom Use?

The right panel in [Table 2](#) presents the results of models exploring religiosity's relationship to condom use in weeks when young women have sex but are *not* using hormonal contraception. The results of the base model, in the top row, suggest that religiosity shares a positive association with condom use. More specifically, for each one-unit increase in a young woman's religiosity, her probability of using condoms that week increases by 1.8 percentage points.

In the second through fourth models, the included mediators have a total indirect effect of less than one percentage point. Thus, these mediators are not predominant pathways by which religiosity is associated with young women's premarital condom use.

In the fifth model, however, women's attitudes have a total indirect effect of 2.2 percentage points, and religiosity's direct effect is no longer statistically significant. Thus, attitudinal differences between women with differing degrees of religiosity do explain religiosity's relationship to condom use. Of these attitudes, the largest mediators are disapproval of premarital sex and beliefs about contraception being morally wrong, which account for 1.0 and 0.8 percentage points of religiosity's total effect,

respectively. Beliefs about how much planning birth control takes and pregnancy desire are also significant mediators, although their indirect effects are small (0.3 and 0.1 percentage points, respectively). Beliefs about motherhood being fulfilling do not have a significant indirect effect. Taken together, these results suggest that attitudes about the morality or acceptability of sex and contraceptive use are the prime attitudinal pathways through which religiosity relates to condom use.

When adjusting for anticipated guilt in the last model, guilt has an indirect effect of 1.2 percentage points and accounts for 68% of religiosity's total effect on women's probability of using condoms. Meanwhile, religiosity's estimated direct effect is attenuated to 0.6 percentage points and is no longer statistically significant. Thus, anticipated sexual guilt is also an important pathway through which religiosity operates when it comes to condom use.

Overall, the results in the right panel of [Table 2](#) indicate that when not using a hormonal method, religiosity is positively associated with young women's condom use. Religiosity's positive relationship to condoms primarily operates through young women's attitudes and anticipated guilt after sex, and to a lesser extent through their family and friend environments. Moral order and learned competencies, on the other hand, do not significantly explain religiosity's relationship to young women's use of condoms as a primary method.

Auxiliary Analyses

A contraceptive work-around framework assumes joint sexual and contraceptive decision-making. To test this, we assess sexual and contraceptive history as mediators. The results in [Table A1](#) in the online appendix confirm that previous sexual activity accounts for 38% of religiosity's total effect on hormonal use, while previous hormonal use explains 18% of religiosity's effect on sexual intercourse and 82% of its effect on condom use. Thus, highly religious young women are less likely to use hormonal contraception in a given week in part because they are less likely to have been sexually active and vice versa. Moreover, they are more likely than other women to use condoms because they are less likely to have ever used hormonal methods.

To further assess religiosity's association with women's joint sexual and contraceptive behaviors, we estimate a multinomial logistic regression predicting women's relative risk of having no intercourse, intercourse with no contraception, intercourse with hormonal contraception only, intercourse with condoms only, and intercourse with hormonal contraception and condoms in a given week. Here, we focus on the estimated effect of religiosity net of denomination and demographic controls only. For ease of interpretation, we present the results five times, each with a different reference category. The results of this supplement further highlight how religiosity's relationship to each of these behaviors is interconnected to its relationship with the others. As shown in the top row of [Table A2](#) (online appendix), the more religious a young woman is, the lower her risk of having sex in a given week, with or without contraception. When having sex, however, her risk of using hormonal contraception and/or condoms does not vary by her religiosity ([Table A2](#), second row). This suggests that the negative direct effect of religiosity on hormonal use in our focal analyses is driven by religious women's lower selection into sex. Such an interpretation

is also consistent with the mediating effect that women's sexual history has on the relationship between religiosity and hormonal use in the previous auxiliary analysis (see Table A1). At the same time, the more religious a young woman is, the lower her risk of using condoms *with* a hormonal method relative to using condoms alone (Table A2, third row). Compared with using condoms *with* a hormonal method, the more religious a young woman is, the higher her risk of having sex with condoms only (Table A2, fifth row). This provides additional evidence to suggest that the more religious a young woman is, the more likely she is to use condoms at intercourse when she is not using a hormonal method.

To more formally examine associations between our proposed mediators and young, unmarried Christian women's reproductive behaviors, we also estimate linear probability models with random effects. The inclusion of random effects in this supplement helps to account for unobserved heterogeneity that is constant over time. As with our primary analysis, we introduce each set of mechanistic indicators into separate models while adjusting for women's religiosity, denomination, and demographic background. The results, presented in Tables A3–A5 in the online appendix, add nuance to our overall conclusions in three key ways. First, consistent with our main mediation analyses, young women's family and friend environments, attitudes, and sexual emotions—but *not* their moral order and learned competencies—are generally predictive of whether they have sex, use hormonal contraception, and use condoms each week. This is true even net of unobserved heterogeneity at the woman level (i.e., net of random effects). Second, in keeping with the mediation observed in Table 2, adjusting for these indicators typically attenuates point estimates on religiosity in random-effects models. The attenuation of religiosity is especially sizable when adjusting for young women's anticipated sexual guilt. Third, and relatedly, young women's anticipated sexual guilt is among the largest predictors of their current reproductive behaviors. Thus, even net of religiosity, young women's anticipated sexual guilt is highly salient to their sexual activity and contraceptive use. In fact, it is even more predictive of these behaviors than are women's sexual and reproductive attitudes, which have been the focus of far greater attention in past demographic literature.

Discussion

Religion plays an important role in the lives of millions of young Americans, three fourths of whom identify with a Christian denomination (Pew Research Center 2015). In this study, we examined the relationship between Christian religiosity and young women's subsequent premarital sexual and contraceptive behaviors and further explored the channels through which religiosity operates, net of denomination. The results indicated that religiosity is negatively associated with sexual activity and hormonal contraceptive use; however, when having sex without using hormonal contraception, women's religiosity is associated with a higher probability of condom use.

By modeling religiosity's relationship to reproductive behaviors with longitudinal data, we moved beyond prior cross-sectional work to demonstrate that religiosity's negative relationships with premarital sex and hormonal contraception are not mere artifacts of reverse causality. This is an important distinction given the possibility that nonmarital sex and contraceptive use may reduce religiosity as a way to alleviate

cognitive dissonance (Regnerus and Uecker 2006). Moreover, our finding that religiosity is positively associated with condom use in the absence of hormonal method use provides evidence that highly religious women prioritize an aversion to stigmatized, nonmarital pregnancies over an adherence to religious norms against contraception (Miller and Gur 2002; Nonnemaker et al. 2003). This positive association emerged both in our bivariate analyses and in our mediation analyses. Moreover, the results of a supplemental multinomial regression further indicated that religiosity is positively associated with women's relative risk of using condoms alone relative to using condoms with a hormonal method. Taken together, these results suggest that when sexually active, more religious young women may employ contraceptive work-arounds by choosing barrier methods, which in contrast to hormonal methods do not require prolonged use to be effective, do not interfere with reproductive cycles, and may be easier to conceal from others.

Our proposed theoretical pathways explain significant portions of religiosity's relationships to sexual intercourse, hormonal use, and condom use. One notable exception, however, was moral order and learned competencies, which did not explain a significant portion of religiosity's association with sexual intercourse or condom use and explained only a very modest portion of its association with hormonal use. With respect to religiosity's effect on premarital sexual activity, anticipated sexual guilt was the largest mediator, followed closely by young women's attitudes—especially their disapproval of premarital sex—and their friends' sexual norms. Young women's family environments explained comparatively smaller but still nontrivial amounts of religiosity's effect on their probability of having sex each week. With respect to contraception, the largest mediators of religiosity's association with hormonal methods and condoms were young women's attitudes. In both cases, the indirect effect of attitudes was approximately 50% larger than anticipated guilt after sex—the second largest mediator. Family and friend environments had the smallest significant indirect effects on young women's probability of using either form of contraception.

Anticipated sexual guilt plays a large role in mediating religiosity's relationship to sexual activity, hormonal contraceptive use, and condom use of young unmarried Christian women. Supplemental random-effects models further highlighted that anticipated guilt shared a sizable association with all three outcomes independent of religiosity. These findings expand the limited scholarship exploring the powerful role of emotions in demographic processes (Axinn et al. 2017; Massey 2002; Rostosky et al. 2003; Uecker 2008) and open up exciting new avenues for future research. For example, are other emotions salient to young women's sex and contraceptive use? If so, which emotions and why? And to what extent does sexual guilt influence sexual and reproductive behaviors within marriage?

Although striking, our findings come with several caveats. First, the RDSL is limited to one county in Michigan. Although in many ways the RDSL is comparable to nationally representative samples of similarly aged women, it differs with respect to its racial and ethnic composition: Black women are approximately twice as represented and Hispanic women are half as represented in the RDSL as in nationally representative samples (Clark 2018). Likewise, though similar in breakdown of Christian religious affiliation to the population of U.S. young adults (Pew Research Center 2015), religious practices and norms may vary geographically. Therefore, our results may be limited in their generalizability. Second, and relatedly, our analyses

estimate *average* associations between religiosity and sexual intercourse and contraceptive use. We are, therefore, unable to speak to potentially important differences in religiosity's relationship to these outcomes across race and class. Third, the RDSL includes information on young women only. We can say little about the relationship between religiosity and women's reproductive behaviors at later stages of the life course, after many become married and begin childbearing. Fourth, religiosity was measured only at baseline in the RDSL. While this allows us to model women's behavior after assessing their religiosity—a substantial improvement over past research (Pearce et al. 2019)—it prevents us from exploring the reverse. To the extent that premarital sex and contraceptive use diminish religiosity, as others have suggested (Thornton et al. 1992), our estimated effects of religiosity should be understated. Fifth, the only emotional measure available to us is anticipated guilt after sex. If emotions about contraception are more relevant to contraceptive use than are emotions about sex, as has been shown with respect to attitudes about sex (Meier 2003), then anticipated guilt after contraceptive use could be a more powerful mediator of the relationship between religiosity and contraception. Likewise, other emotions, such as anticipated shame, may also be relevant. Such possibilities highlight the need for further research investigating the role of a wider range of emotions in reproductive processes.

Religiosity is an important predictor of young unmarried Christian women's sexual activity and contraceptive use. Its association with different contraceptive methods, however, is not uniformly negative. While higher levels of religiosity deter young women from using hormonal methods that require advanced planning and interrupt biological cycles, they heighten the use of condoms in moments when women are not using a hormonal method. Religiosity gains its influence through simultaneously shaping women's normative social environments, reproductive attitudes, and anticipated feelings of guilt after sex. ■

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