



## Specifying the effects of religion on medical helpseeking: The case of infertility<sup>☆</sup>

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### ARTICLE INFO

#### Article history:

Available online 24 May 2010

#### Keywords:

Religiosity  
Motherhood  
Assisted reproductive technology  
Medical helpseeking  
Ethics  
USA  
Utilization  
Infertility

### ABSTRACT

Several recent studies have examined the connection between religion and medical service utilization. This relationship is complicated because religiosity may be associated with beliefs that either promote or hinder medical helpseeking. The current study uses structural equation modeling to examine the relationship between religion and fertility-related helpseeking using a probability sample of 2183 infertile women in the United States. We found that, although religiosity is not directly associated with helpseeking for infertility, it is indirectly associated through mediating variables that operate in opposing directions. More specifically, religiosity is associated with greater belief in the importance of motherhood, which in turn is associated with increased likelihood of helpseeking. Religiosity is also associated with greater ethical concerns about infertility treatment, which are associated with decreased likelihood of helpseeking. Additionally, the relationships are not linear throughout the helpseeking process. Thus, the influence of religiosity on infertility helpseeking is indirect and complex. These findings support the growing consensus that religiously-based behaviours and beliefs are associated with levels of health service utilization.

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Decades of research reveal that religiosity generally has positive effects on both mental and physical health (Ellison & Levin, 1998; Koenig & Larson, 2001; Koenig, McCullough, & Larson, 2001). Researchers are paying increasing attention to the connection between religiosity and medical service utilization as a possible source of the relationship between religion and health (Benjamins, 2006; Hill, Ellison, Burdette, & Musick, 2006; King & Pearson, 2003). This relationship is complex. First, the effect of religion on service utilization varies by specific outcome. Second, the impact of religion can work in contradictory directions; different religious beliefs could promote or hinder helpseeking. Third, the effect of religion may not be linear or identical at all stages of the helpseeking process. Finally, it remains unclear which dimensions of religion influence service utilization. In this article, we explore the influence of religion on infertility helpseeking for women who

meet the medical definition of infertility – twelve months of unprotected intercourse without conception.

### Background

#### Religion and service utilization

Religion has been implicated in reduced mortality, decreased incidence of cardiovascular disease, expedited recovery from illness, and improved mental health (see e.g.; Chatters, 2000; Contrada, Goyal, & Cather, 2004; Hackney & Sanders, 2003; Powell, Shahabi, & Thoresen, 2003). The proposed pathways through which religion influences health include encouraging healthy lifestyle habits, providing social support, bolstering self-esteem and self-efficacy, and providing a coherent structure for interpreting life events (George, Ellison, & Larson, 2002). Differential health care utilization is one possible explanation for the link between religiosity and health. The literature review that follows focuses on religion and service utilization and is not intended to provide a complete review of the extensive literature on religion and health in general.

Studies show that religion is related both to increased and decreased service utilization, depending on the type of service and

<sup>☆</sup> This research was supported in part by grant R01-HD044144 “Infertility: Pathways and Psychosocial Outcomes” funded by NICHD. Dr. Lynn White (The University of Nebraska-Lincoln) and Dr. David R. Johnson (The Pennsylvania State University) were Co-PIs on the first wave of data collection.

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the population examined (see e.g. Benjamins & Brown, 2003; Benjamins, Trinitapoli, & Ellison, 2006; King & Pearson, 2003; McCullough, Larson, Hoyt, Koenig, & Thoresen, 2000). In a literature review on religion and health service utilization, Schiller and Levin (1988) found that 24 of 31 studies showed strong religious effects, but they caution that religion is not a unitary phenomenon; religious affiliation, religious salience, denomination, and religious attendance may not have similar impacts on service utilization. Most studies have focused on attendance and salience, and many are quite dated.

In many studies of religion and health services utilization, need for services is a confounding factor. If, for example, religion is negatively associated with doctor visits in a cross-sectional study, does that mean that religion leads to lower service use, or does it simply mean that religious people are healthier and therefore require fewer doctor visits? Focusing on preventive health services may be a partial solution to this issue. Studies investigating religion and the use of preventive health services show some positive associations. More frequent religious attendance is associated with increased likelihood of blood pressure screening (Benjamins, 2007; Felix-Aaron, Levine, & Burstein, 2003), diabetes screening (Benjamins, 2007), cancer screening (Benjamins, 2006); cholesterol screening (Benjamins, 2005, 2006), and regular checkups (Hill et al., 2006). Results, however, are inconsistent. For example, other studies fail to find associations between frequency of attendance and cholesterol screening (Benjamins, 2007), cancer screening (Fox, Pitkin, Paul, Carson, & Duan, 1998), and regular checkups (Ellison et al., 2008).

Studies of the impact of religious salience, or the importance of religion to an individual, reveal similar inconsistencies. Religious salience is positively related to blood pressure screening (Benjamins, 2007), cholesterol screening (Benjamins, 2007; Benjamins & Brown, 2004), cancer screening (Benjamins, 2006; Benjamins & Brown, 2004; Benjamins et al., 2006), and getting flu shots (Benjamins & Brown, 2004). Yet, a study of older American women found religious salience was not associated with Pap smears or mammograms (Benjamins, 2006), and another study found no association between salience and diabetes screening among older Mexican adults (Benjamins, 2007). Thus, religious salience is often, but not always, associated with preventive service use.

Although a majority of studies indicate that the relationship between religion and health behaviors and outcomes is positive, there is also evidence of a negative association. Religion can influence the types of medical treatment perceived as acceptable: the belief that certain treatments are not supported by religious doctrine may lead to treatment refusal or discontinuation. Some religions forbid or strongly discourage using specific medical devices or procedures such as contraceptives, vaccinations, and blood transfusions (Asser & Swan, 1998; Muramoto, 1999). Increased religiosity could also be associated with lower service utilization because of higher fatalism or external locus of control among those who are more religious (Nagel & Sgoutas-Emch, 2007). Individuals with lower personal efficacy and control should be less proactive than those with higher personal efficacy or control (Rodin, 1990; Zarit, Pearlin, & Schaie, 2002). These sentiments could lead to an underutilization of health care services, such as those for cancer screening (Straughan & Seow, 1998, 2000). Other researchers, however, have argued that persons with a strong perception of God's control may enjoy more favorable outcomes, especially compared with their counterparts who attribute control to non-religious external forces (Holt, Clark, Kreuter, & Rubio, 2003; Holt, Lukwago, & Kreuter, 2003; Johnson, Elbert-Avila, & Tulskey, 2005; Schieman, Pudrovska, Pearlin, & Ellison, 2006).

The inconsistencies in the prior literature regarding religion and service utilization are not well understood. No clear patterns

emerge from the previous studies, with the possible exception that the studies reporting positive associations between religion and preventive service use tend to consist of samples of older people (e.g. Benjamins, 2006; Benjamins, 2007; Benjamins & Brown, 2003). Although we presume that the particular outcome under study should impact the relationship, we see no clear conclusion regarding the association between religion and utilization by type of service studied. Therefore, it is important that future studies include possible mechanisms that can better explain precisely how religion influences utilization.

More information about possible mechanisms is also helpful to better understand the influences that various dimensions of religion, such as religious attendance and salience, could have on service utilization. There are many theoretical reasons why these dimensions would operate differently. Measures of public religious participation, such as attendance, reflect social benefits provided to individuals through involvement with a religious organization. These may include greater access to services and health information and increased motivation to maintain a healthy lifestyle. Individuals who frequently attend religious services have larger social networks, more frequent social interactions, and more frequent (and more types of) instrumental and socioemotional assistance than individuals who attend less often or never (Bradley, 1995). Research on the effects of social relationships on a wide range of health behaviors supports the health enhancing benefits of these types of social interactions (Lewis & Rook, 1999). Religious congregations can also provide normative guidance for individual members, which may increase positive health behaviors (Hoffmann & Bahr, 2005). Furthermore, religious attendance may also have more direct influences on preventive health care utilization. For example, some churches offer activities or information about health-related topics that may lead (directly or indirectly) to a greater use of health care services by members exposed to these resources. This direct role may help to explain some of the associations found for preventive health services but is expected to be less relevant to fertility-related services.

The potential explanations for an association between aspects of religion and health care use are less clear. Participating in private religious activities (e.g. prayer or reading religious texts), holding religious beliefs, and considering religion to be important in one's life may all impact service utilization through various pathways. Although limited, most research on this topic involves the influence of religious beliefs in encouraging positive health behaviors. Most of the findings, however, do not support such a relationship. For example, among Presbyterians, there was no support for the mediating role of the belief in a responsibility to God to maintain one's health and a belief in the connection between spiritual and physical health (Benjamins et al., 2006). Another study found that beliefs in the sanctity of the body are actually associated with a decreased likelihood of having a routine health exam in the past year (Ellison et al., 2008). In contrast, Mahoney et al. (2005) found that sanctification of the body predicted positive health practices in college students. The influence of prayer and possible explanations for the impact of salience are also understudied; therefore there needs to be more work in this area.

Thus, although religion is associated with service utilization, it is difficult to succinctly characterize the relationship. Previous studies show generally positive, though not consistent, associations with utilization that cannot be explained by differing samples or outcomes. It is also not clear what characteristic or quality of religion is related to helpseeking. The impact of religion may be due to selection, better health of religious individuals, social support and capital from religious participation, specific health initiatives undertaken by certain religious organizations, or content of religious beliefs or specific theologies (Ellison et al., 2008). We address

these limitations by extending the literature to another health service outcome of interest; by examining two distinct aspects of religion; and by investigating the role of potential mediators.

### *Infertility and helpseeking*

We assess the relationship between religiosity and health behavior via infertility helpseeking. The prevalence of infertility worldwide was recently estimated at 9% (Boivin, Bunting, Collins, & Nygren, 2007). According to the National Survey of Family Growth (NSFG), 15% of U.S. women reported “impaired fecundity” in 2002 (Chandra, Martinez, Mosher, Abma, & Jones, 2005), but lifetime prevalence rates are considerably higher. A probability-based sample of women in 12 Midwestern states found that 38% of women aged 25 to 45 reported infertility at some point in their lives (White, McQuillan, Greil, & Johnson, 2006).

Studies describe infertility as a devastating experience that brings feelings of emotional distress and a high level of commitment to treatment-seeking, especially among women (Becker, 2000; Greil, 1991; Sandelowski, 1993). Given this characterization, it is surprising that less than half of infertile women seek medical treatment (Boivin et al., 2007; Chandra & Stephen, 1998). Of the infertile women studied in Wave 1 of the National Survey of Fertility Barriers (NSFB) (the dataset we use for this paper), 27% had visited a doctor concerning fertility problems, 21% more had gone on to have tests or treatment, and 3% had undergone in vitro fertilization (IVF) or other assisted reproductive technologies (ART) (Johnson & White, 2009).

Examining infertility helpseeking expands the study of religion and service utilization beyond health-related preventative behaviors. First, it is a condition with a high incidence but a relatively low treatment rate. In addition, many people do not seek help for infertility soon enough for treatment to be optimally effective. Second, infertility treatment is largely voluntary; it is rarely life-threatening and health professionals usually learn of it only when brought up by patients. It is a condition that need not be interpreted medically and for which many people do not, in fact, seek medical solutions. Finally, religion may be particularly salient for these types of decisions because religious traditions and beliefs are strongly connected to family and life course issues such as fertility.

Most religious traditions encourage child-bearing and emphasize the importance of family during services and other activities. Studies that find that higher religiosity is associated with lower acceptance of childlessness (Bulcroft & Teachman, 2004; Koropecykj-Cox & Pendell, 2007) and higher fertility intentions (Hayford & Morgan, 2008). Research suggests that people with strong religious beliefs tend to be more traditional in lifestyle choices, gender ideology, and marriage and family patterns (Grasmick, Wilcox, & Bird, 1990; Jensen & Jensen, 1993), and this may encourage the pursuit of infertility treatment.

Importantly, many of the advances in reproductive technology are discouraged or prohibited by religious traditions. Religious officials are concerned with two main issues – the sanctity of the marital relationship and the sanctity of the embryo (for reviews, see Dutney, 2007; Schenker, 2005). For some denominations, such as Roman Catholicism, this results in opposition to the use of artificial insemination (including intra-uterine insemination (IUI) and in vitro fertilization (IVF)) (Congregation for the Doctrine of the Faith, 1987). Protestantism, Judaism, and Islam have slightly fewer restrictions than Catholicism; these traditions generally approve of advanced reproductive technology (ART), but they are against the use of donor gametes (Dutney, 2007). Perhaps for these reasons, religious individuals may choose to avoid such technologies and favor alternatives such as adoption. In fact, religious salience is associated with increased likelihood of seeking to adopt

(Hollingsworth, 2000). Thus, the relationship between religion and infertility helpseeking is expected to be complex.

Finally, it is important to address factors relevant to infertility helpseeking. Women with primary infertility (no prior pregnancies) are more likely to seek help than are those with secondary infertility (Hirsch & Mosher, 1987; Schmidt & Munster, 1995). Greil and McQuillan (2004) and Jacob, McQuillan, and Greil (2007) showed the importance of considering pregnancy intentions at the time of the infertility episode. They categorized infertile women into two groups: “infertile with intent” (women who say they tried to conceive for at least 12 months without conception) and “infertile without intent” (women who report having had unprotected intercourse for a year or more without conception but who do not say that they were trying to conceive at the time). The infertile with intent are significantly more likely to seek treatment than the infertile without intent (White et al., 2006). Other factors associated with infertility helpseeking include wanting another child, higher income and education, and having private health insurance (Greil & McQuillan, 2004; Greil, McQuillan, Shreffler, Johnson, & Slauson-Blevins, 2009; White et al., 2006). Greil et al. (2009) found that Hispanic women were less likely to seek help even after a large array of other factors were controlled.

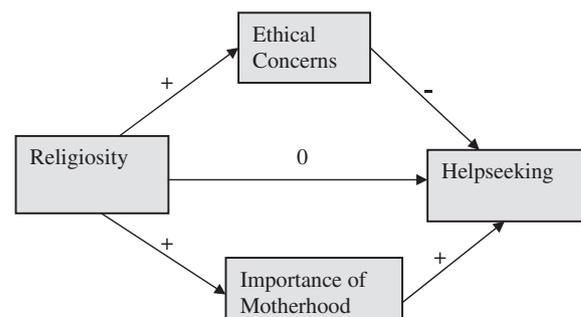
### *Statement of the problem*

Our goal is to assess the influence of various aspects of religiosity on infertility helpseeking. There are reasons to expect that religiosity should impact infertility helpseeking. First, there is a generally positive association between religiosity and service utilization, previously discussed, that suggests religious women may be more likely to utilize health services. In addition, because many religions embrace pronatalist ideals, motherhood may be more important to more religious women; this should increase religious women’s likelihood of helpseeking if they experience fertility barriers. Certain religious beliefs, however, could also lead to fatalism. Religiosity may also increase ethical concerns about fertility treatment. We hypothesize that these two countervailing, mediating forces, importance of motherhood and ethical concern, will cancel each other out and that there will be no significant net effect of religiosity on infertility helpseeking. Fig. 1 presents a schematic drawing of our basic theoretical model.

## **Methodology**

### *Sample*

Our data come from the NSFB, a national random-digit-dialing telephone survey we designed to assess social and health factors related to reproductive choices and fertility for U.S. women. Between September 2004 and December 2005, we completed



**Fig. 1.** Basic theoretical model. Note: “0” indicates that no effect is anticipated.

interviews with 4712 women ages 25 to 45. We draw our data from 2183 women who reported experiencing an infertility episode at some point in their lives. Although the NSFB also included interviews with a subsample of male partners, we did not include men in this analysis because it would have significantly reduced our sample size ( $n = 926$ ) and analyses of the NSFB data have shown that male partners who responded to the survey represent a more select group of men (Johnson & White, 2009). For the purposes of this study, we were interested in the relationship between religion and helpseeking in a more representative group of women. Additionally, studies have shown that women are typically the more instrumental partner when a couple experiences infertility, taking responsibility for initiating helpseeking or treatment (Greil, 1991; Throsby & Gill, 2004).

Sampling procedures and selection criteria were used to ensure an adequate representation of women from racial/ethnic minority groups, women who have experienced infertility, and women who desire additional children. Ethics approval was provided by the University of Nebraska at Lincoln and the Pennsylvania State University. Because the survey was long (potentially taking over 45 min to complete), we shortened it by randomly assigning participants to two-thirds of the items of each scale. This “planned missing” design provided a way to incorporate measures of all of the necessary theoretical concepts while minimizing respondent burden. This type of missing data fulfills the ‘missing completely at random’ (MCAR) assumption and does not bias results (Allison, 2002). We used the mean of available scale items in the analyses. The response rate for this sample is 53% for the screener and 37.2% overall. This response rate is typical for telephone surveys conducted in the last several years (McCarty, House, Harman, & Richards, 2006). Recent studies have shown that surveys with lower response rates are not necessarily more biased than higher response rate studies (Keeter, Kennedy, Dimock, Best, & Craighill, 2006). To assess representativeness we compared it to the National Survey of Family Growth (NSFG), a population-based survey with a response rate close to 90%, and found very similar responses to equivalent fertility-specific and demographic questions in the two surveys.

### Concepts and measures

Our main outcome is infertility *helpseeking*. Respondents were asked a series of questions about information-seeking, treatment-seeking, tests, and treatments related to infertility. From these, we constructed an ordinal variable with six values: (0) did not seek help (1) considered treatment; (2) talked to a doctor; (3) had tests; (4) received treatment; and (5) had ART. Anyone at a higher value has satisfied the conditions for all lower values. For example, anyone who has had tests has also talked to a doctor and considered treatment. Of the infertile women studied in Wave 1 of the NSFB, 63.4% reported not seeking help, 8.9% reported “considered only,” 7.0% saw a doctor only, 7.0% had tests but did not move on to treatment, 10.7% received conventional treatment only (such as artificial insemination or fertility drugs to stimulate ovulation), and 2.7% had some form of assisted reproductive technology (ART), involving manipulation of both egg and sperm outside of the body.

We used two main variables to capture religious involvement and belief: *religiosity* and *religious attendance*. *Religiosity* was measured by three questions: 1) “About how often do you pray,” 2) “How close do you feel to God most of the time,” and 3) “In general, how much would you say your religious beliefs influence your daily life?” The items formed a single factor with high reliability ( $\alpha = .77$ ). This was treated as a latent variable in our model. *Religious attendance* was assessed via a single question: “How often do you attend religious services?” Possible responses included:

“never,” “less than once a year,” “about once or twice a year,” “about once a month,” “nearly every week,” “every week,” and “several times a week.” The Pearson’s  $r$  between religiosity and attendance is .274. We did not include a measure of religious denomination because a sufficiently detailed measure was not available to us.

### Mediating variables

Our focal mediating variables were *importance of motherhood* and *attitudes toward the ethics of ART*. Both were treated as latent variables in our model. *Importance of motherhood* was constructed by averaging responses to five questions. Four items were measured using Likert scales (strongly agree to strongly disagree): 1) “Having children is important to my feeling complete as a woman,” 2) “I always thought I would be a parent,” 3) “I think my life will be or is more fulfilling with children,” and 4) “It is important for me to have children.” A fifth item was measured on a scale from very important to not important: “How important is each of the following in your life...raising children?” Higher scores indicate greater importance of motherhood. Factor analyses showed that these items formed a single factor that explained 64% of the variance ( $\alpha = .86$ ). *Attitudes toward the ethics of ART* is a scale assessing the respondent’s concern with six instances of ART ( $\alpha = .86$ ): 1) insemination with husband’s sperm, 2) insemination with donor sperm, 3) in vitro fertilization, 4) use of donor eggs, 5) surrogate mothering, and 6) using a gestational carrier. Each item had three ordered response categories indicating no, some, or serious ethical problems.

### Control variables

A number of variables that have been shown to influence infertility helpseeking were included as controls in the analyses. Women who described themselves as trying to become pregnant at the time of their infertility episode were classified as *infertile with intent*, while women who did not report themselves as actively trying to become pregnant during their infertility episode were classified as *infertile without intent*. Respondents were classified as having *primary infertility* if they experienced a period of infertility before they had experienced any pregnancies. All other women were classified as having *secondary infertility*. *Wants another child* was coded 1 for those responding ‘yes’ to the question: “Would you, yourself, like to have (another) baby?” Age was measured in years. Due to people’s sensitivity to questions about income, *family income* was first constructed as an ordinal scale ranging from 1 (less than \$5000 per year) to 12 (\$100,000 or more). We then substituted the midpoint of each category for the category value in order to convert this into a continuous scale. Education was measured in years. *Private health insurance status* was assessed by the question, “Are you covered by private health insurance, by public health insurance such as Medicaid, or some other kind of health care plan or by no health insurance?” Respondents with private health insurance were coded as 1 while all other options were coded as 0. Public health insurance is appropriately classified with no insurance because infertility benefits are not covered by Medicaid in the U.S. (Bittler & Schmidt, 2006). Dummy variables for *race* were constructed for Black, Hispanic, and Asian compared to non-Hispanic White women and women who listed their race as “other.” We collapsed the latter two because the small “other” group did not differ significantly from non-Hispanic White women with regard to the variables of interest.

### Method of analysis

Fig. 2 displays our full structural equation model. Our final dependent variable was infertility helpseeking. Religiosity was conceptualized as having indirect effects on helpseeking through religious attendance, ethical concerns, and importance of

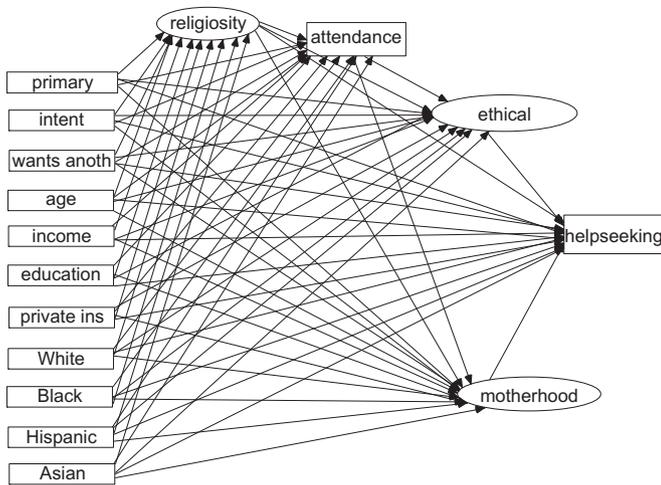


Fig. 2. Elaborated SEM model.

motherhood. Although we have hypothesized that religiosity would not have a direct effect on helpseeking, we retained the direct path in the model to test for this possibility. The ethics of ART and the importance of motherhood were included as latent variables with the items in each scale serving as the multiple indicators of the respective underlying constructs. All of the paths from the control variables to the focal variables in the model were left unconstrained in order to take into account the possible effects of the control variables on the focal variables.

We were restricted from using the common basic linear structural equation model both because our main outcome variable was ordinal and because we are interested in testing if the religiosity effects varied by treatment level. If the effects of the explanatory variables were the same at each level of helpseeking then an ordinal logistic regression model would be more parsimonious as only one coefficient for each variable would be needed. Ordinal logistic regression is appropriate only when the parallel lines assumption, also referred to as the proportional odds assumption, is met (Winship & Mare, 1984). This requires that the slopes predicting values of the dependent variable be parallel for every level of the dependent variable (Brant, 1990). The parallel lines assumption did not hold for our model so we treated helpseeking as a series of discreet stages rather than as a single ordinal variable. We followed the example of Williams (2006) and conducted five separate structural equation models with binary outcomes to estimate the effects of religiosity at each transition in the helpseeking process. All cases were included in each model; only the cut point was changed. For example, the first analysis included all women and compared those who did not seek help with all women at later stages (considered helpseeking and beyond), while the second analysis also includes all women but uses whether women actually saw a doctor as the cut point. The analysis was done with the full information maximum likelihood estimation method which uses all cases even if some variables have missing data.

## Results

Table 1 shows descriptive statistics by each stage of helpseeking. For ease of presentation, continuous variables in our final model have been broken into categories. Women who have progressed to different stages of the helpseeking process appear to differ across all of the independent variables in the model. Thus, there is good reason to include these variables in an analysis of the relationship

between religiosity, religious attendance, ethical concerns, importance of motherhood, and helpseeking.

The results of the series of analyses are in Table 2. For ease of presentation, we have not displayed the control variables (available upon request). Although the  $\chi^2$  is significant in all analyses, other fit statistics are within the prescribed limits, suggesting that the model fits the data adequately. Neither religiosity nor religious attendance was associated with helpseeking in any of the analyses. Ethical concern about reproductive technology was negatively associated with helpseeking at all stages of the treatment process except the transition to ART; for this latter comparison, this may be due low statistical power because the effect size remains large (OR = .60). The relationship is strongest when comparing tests and lower stages of helpseeking to being treated. Increased ethical concerns reduces the odds of moving to the treatment stage by a factor of over three (OR = .30). Thus, the influence of ethical concerns on helpseeking can be observed throughout the helpseeking process but is strongest at the point where women move from lower stages of helpseeking to actually undergoing treatment.

Importance of motherhood was associated with increased odds of helpseeking, but only at two stages of the treatment process: when women moved between seeing a doctor and all lower stages of helpseeking to actually having medical tests (OR = 1.25) and between conventional treatment and lower stages to ART (OR = 1.43). Thus, the importance of motherhood plays a role at two crucial points in the helpseeking continuum where women must commit to undergoing invasive and time-consuming procedures. Having primary infertility and being infertile with intent were both associated with higher odds of proceeding to the next stage of helpseeking for all analyses. Stronger desire to have a child and having private insurance increased the odds of being in the next level of helpseeking in the early stages of the process. Age was relevant to helpseeking in the middle of the process. Race and income both were associated with helpseeking in the later stages of helpseeking. Our analysis accounts for about half of the variation in helpseeking (pseudo- $R^2$  ranges from .441 to .547).

We turn now to the mediating variables: ethical concern and importance of motherhood. Religiosity was not related to ethical concerns about infertility treatment in any of the analyses, but religious attendance was positively associated with ethical concerns, regardless of helpseeking stage. In other words, women with higher levels of religious attendance were more likely to express ethical concerns about assisted reproductive technology. Additionally, Black, Hispanic, and Asian women express greater ethical concerns about infertility treatment than non-Hispanic White women and those who identify as members of other races.

As hypothesized, higher religiosity was associated with higher importance of motherhood in all five analyses. Women with primary infertility had lower importance of motherhood scores than women with secondary infertility. Women who were infertile with intent and women who reported wanting a (nother) child had higher importance of motherhood scores. Higher age was associated with lower importance of motherhood in all analyses. Black and Hispanic women scored lower on importance of motherhood than other women. Our analysis accounted for approximately one eighth of the variation in importance of motherhood ( $R^2 = .135$ ). Religiosity was strongly associated with religious attendance in all analyses. Thus, although religiosity was not associated with ethical concerns directly, it was associated with religious attendance, which in turn was associated with ethical concerns. Higher income and education were associated with higher religious attendance in all analyses, but with lower religious beliefs in all analyses. Black and Hispanic women have higher religiosity scores than non-Hispanic White women and women of "other" races in all analyses.

**Table 1**  
Descriptive statistics by categories of helpseeking.

	No help 1383%	Considered 195%	Talked to doc 153%	Tests 159%	Treatment 234%	ART 59%	p.	N for row 2183
<i>Religiosity</i>								
Lowest quartile	21.7	28.2	28.8	33.3	19.2	32.2	*	516
Second quartile	31.4	26.7	24.8	23.9	28.6	23.7	n.s.	643
Third quartile	20.9	20.5	20.9	21.4	25.2	22.0	n.s.	467
Highest quartile	26.0	24.6	25.5	21.4	26.9	22.0	n.s.	557
<i>Religious attendance</i>								
Lowest third	36.3	35.7	33.9	36.5	33.3	38.8	n.s.	782
Middle third	35.9	37.9	40.1	36.8	29.8	34.2	n.s.	780
Highest third	27.8	26.3	26.0	27.0	36.8	27.1	*	621
Primary infertility	17.7	40.5	39.2	58.5	65.1	76.3	***	674
Infertile with intent	28.0	72.2	72.4	85.5	94.4	96.7	***	1053
Wants a(nother) child	34.3	60.8	52.3	57.6	46.5	59.3	***	908
<i>Age</i>								
25 to 29	20.3	27.3	18.3	11.4	11.1	5.1	***	409
30 to 35	25.7	26.8	28.1	35.4	24.8	23.7	n.s.	579
36 to 40	23.6	26.3	29.4	22.8	28.2	37.3	n.s.	547
41 to 45	30.3	19.6	24.2	30.4	35.9	33.9	**	647
<i>Income</i>								
40K and greater	49.7	53.3	56.6	53.3	69.2	87.5	***	1176
Below 40K	50.3	46.7	43.4	36.7	30.8	12.5	***	991
Education	.0	.0	.0	.0	.0	.0		
Less than H S.	18.6	18.5	15.1	12.6	11.2	3.4	**	365
High school	32.4	25.1	37.5	22.0	28.0	16.9	**	665
Some college	29.9	29.7	28.9	29.6	30.6	22.0	**	647
College degree or more	19.1	26.7	18.4	35.8	30.2	57.6	***	506
Private health insurance	54.0	56.9	67.1	70.4	72.8	86.4	***	1294
<i>Race</i>								
White	52.7	47.1	60.8	60.4	65.6	79.7	***	1210
Black	23.2	22.1	16.3	16.4	7.2	5.1	***	435
Hispanic	19.5	22.6	22.9	13.8	14.9	5.1	*	409
Asian	4.9	8.2	.0	9.4	12.3	10.2	***	134
<i>Ethical concerns</i>								
Lowest	31.1	30.3	30.7	27.2	37.6	40.7	n.s.	691
Higher	38.8	41.5	42.5	39.9	46.6	44.1	n.s.	881
Highest	32.1	28.2	26.8	32.9	15.8	15.3	***	638
Motherhood important	47.1	52.8	46.1	58.5	62.4	78.0	***	1110

Chi square tests performed on all variables.

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

**Table 2**  
Effects of religiosity on stages of infertility helpseeking ( $N = 2167$ ).

	Considered		Talked to doctor		Tests		Treatment		ART	
	Est.	Beta	Est.	Beta	Est.	Beta	Est.	Beta	Est.	Beta
<i>Dep=religious attendance</i>										
Religiosity	1.213	.598 ***	1.210	.598 ***	1.210	.598 ***	1.202	.599 ***	1.208	.599 ***
R square	.355		.354		.355		.356		.356	
<i>Dep=ethical concerns</i>										
Religiosity	.011	.052	.011	.052	.011	.052	.011	.052	.011	.051
Religious attendance	.017	.159 *	.017	.159 **	.017	.159 **	.016	.158 **	.017	.159 **
R square	.093		.093		.093		.093		.093	
<i>Dep=importance of motherhood</i>										
Religiosity	.096	.200 ***	.096	.176 ***	.1	.200 ***	.095	.200 ***	.095	.200 ***
Religious attendance	.010	.041	.010	.041	.010	.041	.010	.041	.010	.041
R square	.135		.135		.135		.135		.135	
<i>Dep=helpseeking</i>										
Ethical concerns	-.424	.654 *	-.477	.621 **	-.689	.502 **	-1.219	.296 ***	-.520	.595
Importance of motherhood	.120	1.127	.114	1.121	.222	1.249 **	.173	1.189	.359	1.432 **
Religious attendance	.037	1.038	.022	1.022	.045	1.046	.024	1.024	-.009	.991
Religiosity	-.096	.908	-.051	.950	-.046	.955	.116	1.123	.080	1.083
Pseudo R square	.459		.441		.504		.547		.493	
Chi square	133.993		132.276		136.957		138.987		139.565	
CFI	.961		.962		.958		.956		.957	
TLI	.956		.957		.953		.951		.951	
RMSEA	.019		.019		.020		.020		.020	
WRMw	.905		.883		.914		.921		.917	

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

Helpseeking categories: 0 = No help; 1 = Considered; 2 = talked to Doctor; 3 = Medical tests; 4 = Infertility Treatment; 5 = ART Control Variables (primary infertility, infertile with intent, wants a(nother) child, age, income, education, private health insurance, race) not displayed.

**Table 3**  
Total, Indirect, and direct effects of religiosity on stages of infertility helpseeking.

	Considered			Talked to doctor			Tests			Treatment			ART		
	Est.	S.E.	Sig.	Est.	S.E.	Sig.	Est.	S.E.	Sig.	Est.	S.E.	Sig.	Est.	S.E.	Sig.
Total effects	-.52	.04	n.s.	-.03	.05	n.s.	-.01	.05	n.s.	.13	.05	**	.09	.06	n.s.
Total indirect effects	.04	.04	n.s.	.02	.04	n.s.	.05	.04	n.s.	-.01	.04	n.s.	.01	.05	n.s.
Through attendance	.04	.04	n.s.	.03	.03	n.s.	.05	.04	n.s.	.03	.04	n.s.	-.01	.05	n.s.
Through ethical concern.s.	.00	.01	n.s.	-.01	.01	n.s.	-.01	.01	n.s.	-.01	.01	n.s.	-.01	.01	n.s.
Through att, ethics	-.01	.01	n.s.	-.01	.01	n.s.	.00	.01	*	-.02	.01	**	-.01	.01	n.s.
Through motherhood	.01	.01	n.s.	.01	.01	n.s.	.02	.01	**	.02	.01	n.s.	.03	.16	*
Through att, mother	.00	.00	n.s.	.00	.00	n.s.	.00	.00	n.s.	.00	.00	n.s.	.00	.01	n.s.
Direct effects	-.10	.06	n.s.	-.05	.06	n.s.	-.07	.07	n.s.	.12	.07	n.s.	.08	.10	n.s.

Table 3 further specifies the patterns of associations by providing total, direct, and indirect effects of religiosity on helpseeking. Only in the comparison between treatment and all lower stages of helpseeking is the total effect of religiosity on helpseeking significant. The direct effects of religiosity on helpseeking are not significant in any models. In some analyses, religiosity is associated with lower helpseeking through attendance and ethical concerns, and in others is associated with higher helpseeking through importance of motherhood. These effects, however, cancel each other out in all but one case.

### Discussion and conclusions

The current study is the first we know of that examines the relationship between religion and infertility helpseeking using a nationally representative sample. Religion is not *directly* related to infertility helpseeking in most analyses, though this does not mean that religion is unrelated to helpseeking. Specifically, the positive effect of religion on helpseeking through the importance of motherhood is counterbalanced by a strong negative impact through increased ethical concerns. The evidence presented here suggests that the relationship between religion and infertility helpseeking is complicated. First, as noted above, religion appears to have both positive and negative impacts on infertility helpseeking. Second, the influence of religiosity on importance of motherhood is direct while the influence of religiosity on ethical concerns is indirect, through religious attendance. Third, the exact nature of the relationship between religion and helpseeking varies at different stages of the helpseeking process. It is only at the stage of moving from all lower stages of helpseeking (i.e., seeing a doctor, contemplating seeking help, not seeking any help) to receiving tests that our hypothesis is confirmed.

Our findings confirm previous research that identifies stronger pronatalist beliefs among religious women (Hayford & Morgan, 2008; Koropecykj-Cox & Pendell, 2007). Results also lend support to studies indicating increased ethical concerns about medical tests and treatments, such as genetic testing and prenatal tests, among religious individuals (Singer, Corning, & Lamias, 1998). These conflicting influences result in a lack of an overall relationship, which is at odds with the previous findings that higher religiosity is associated with higher odds of seeking non-necessary medical service utilization. These previous studies on preventive services provide some foundation for the current study, which also examines a “voluntary” health service. The treatments for infertility are debated by religious leaders, however, and in some cases prohibited. Therefore the association between religiosity and medical helpseeking seems to depend upon the specific health issue studied. The relevance of religion for fertility in general and for infertility treatments, therefore, is likely to make helpseeking for this condition unlike many other health conditions.

As noted earlier, the possible mechanisms linking the different dimensions of religion to service utilization could be specific to

each dimension. The current study revealed that religiosity is only related to ethical concerns about infertility treatments through attendance. In other words, it is only through involvement at religious services that religious women become more likely to have such ethical concerns. This may reflect individuals who attend more frequently having greater exposure to their religious organization's official position on allowable infertility treatments. In contrast, individuals who have high levels of religiosity but less (or no) involvement with a religious organization may be unaware of such theological debates and stances. In addition, those who attend religious services more frequently may also be exposed to other individuals who disapprove of those choosing to disregard church policies and who may offer support for choosing alternatives in line with the stated positions. Findings regarding the lack of an association between attendance and the importance of motherhood are less easily explained and deserve further exploration.

As with all studies, there are limitations to this project. First, cross-sectional data limit strong conclusions about temporal ordering. We know, for example, that higher ethical concerns are associated with lower levels of helpseeking, but we cannot decisively conclude that ethical concerns cause women to forgo treatments that might be medically appropriate. To make such claims, we need longitudinal data. Wave 2 of the NSFB, now in the field, will provide better temporal ordering and more clarity about the direction of associations. Central concepts (religiosity, importance of motherhood, and ethical concerns) were also measured contemporaneously, after the infertility episode. Therefore is possible that some women may have different attitudes at the time of the survey than they did during the infertility episode. For example, women who had few ethical concerns at the time they decided not to pursue treatment might have developed ethical concerns in retrospect. Here too, data from Wave 2 should help further specify the patterns of associations.

Many of the effect sizes reported here are relatively small. Clearly, we cannot argue that religion accounts for a major portion of the variation in infertility helpseeking. Nonetheless, the study of infertility has been shown to be an appropriate site for demonstrating the complexities of the association between religion and helpseeking. Another limitation of this study is that we were unable to test for the association of religious denomination on infertility helpseeking. This is an important issue to address in future studies.

In addition, more work is necessary to better understand the role of social and cultural factors in helpseeking. To begin, specific information about an individual's religious affiliation would be useful to clarify the theological and social sources of potential ethical concerns. Furthermore, other aspects of the culture in which the infertile individual resides could be expected to influence the relationship between religion and helpseeking. To elucidate these influences, future studies are needed to explore the impact of religion among specific race/ethnic groups and within different countries. Additionally, because infertility is often experienced in the context of marriage

or other intimate relationships, it may be important to understand how partners' religiosity and religious affiliations either promote or inhibit helpseeking, particularly if partners have differing religious attitudes or dissimilar religious affiliations.

This study has implications beyond the study of infertility. Most generally, it supports the growing consensus that religiously-based behaviours and beliefs are associated with service utilization under specific conditions. For non-life threatening conditions, this study suggests that the meaning of the problem (e.g. importance of motherhood) mediates the association between religiosity and helpseeking. Additionally, if treatments are the topic of religious teaching (e.g. abortion, stem cell therapies), then attitudes about the ethics of these concerns should mediate the effects of religiosity on medical helpseeking. Specifying the associations between religious behaviour, religious beliefs, and medical helpseeking shows how meanings of symptoms and outcomes are crucial to understanding medical care. Increasing access to care by reducing cost and increasing coverage are very important, but alone are unlikely to be to meet potential medical care need. It is also important to understand the meaning of symptoms and treatments in order to understand how religion is associated with health service utilization.

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