

# Religion and preventive service use: do congregational support and religious beliefs explain the relationship between attendance and utilization?

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**Abstract** Religious individuals are more likely to engage in healthy practices, including using preventive services; however, the underlying mechanisms have not been adequately explored. To begin addressing this, the current study examines the association between religious attendance, four aspects of congregational support, two health-related religious beliefs, and the use of preventive services (cholesterol screening, flu shot, and colonoscopy) among a national sample of Presbyterian adults ( $n = 1,076$ ). The findings show that two aspects of congregational support are relevant to these types of behavioral health. First, church-based health activities are significantly related to the use of cholesterol screenings and flu shots ( $OR = 1.13$ ,  $P < .05$ ;  $OR = 1.10$ ,  $P < .05$ , respectively). Second, discussing health-related issues with fellow church members is also significantly associated with reporting a cholesterol screening ( $OR = 1.15$ ,  $P < .05$ ), as well as moderately predictive of colonoscopy use ( $OR = 1.10$ ,  $P < .10$ ). Neither of the religious beliefs related to health, such as the

God locus of health control scale or beliefs about the sanctity of the body, are related to preventive service use in this population. Although attendance is predictive of service use in unadjusted models, the association appears to be explained by age rather than by the congregational or belief variables. These findings contribute to a more nuanced understanding of the various ways in which religion might impact health behaviors and may also help to shape and refine interventions designed to improve individual well-being.

**Keywords** Religion · Prevention · Church attendance · Beliefs · Behavioral health

A substantial research literature now demonstrates that religious involvement has salutary effects on a broad range of mental and physical health outcomes, including mortality risk (Chatters 2000; Hummer et al. 2004, 2010). Such findings have led investigators to explore a number of possible mechanisms via which aspects of religiousness may influence health and well-being. Examples have included support networks, coping processes, and other psychosocial variables such as optimism and hopefulness, meaning, and forgiveness (Ellison and Levin 1998; Idler et al. 2003; Krause and Ellison 2003; Pargament 1997). In addition, studies have linked religious involvement with an impressive array of behavioral health outcomes, including drinking, smoking, drug use, seatbelt use, sleep quality, and exercise (Gillum 2005, 2006; Hill et al. 2006, 2007; Wallace and Forman 1998). Such lifestyle variables may help to explain the observed relationships between religiousness and health outcomes.

Another related mechanism underlying the religion-health connection may involve the use of health care. For

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some time, studies have shown religious differentials in need-based services, such as hospitalizations and emergency room visits (e.g., Koenig and Larson 1998). In addition, religious individuals tend to report greater continuity of care (King and Pearson 2003), trust in their health care providers (Benjamins 2006a), and satisfaction with the care they receive (Benjamins 2006b). One important line of work has centered on religious differences in preventive care utilization. Although early studies in this area focused mainly on denominational variations in use of specific services, particularly breast and cervical cancer screening (Miller et al. 1980; Miller and Champion 1993; Murray and McMillan 1993), more recent studies examine other aspects of religious involvement, and their links with a number of types preventive services. Although the evidence is not unequivocal (e.g., Fox et al. 1998; Schmueli and Tamir 2007), the most consistent pattern in this literature indicates that older adults who attend religious services regularly are more likely than their less religiously active counterparts to avail themselves of preventive health care (Arredondo et al. 2005; Benjamins 2005, 2006c, 2007; Benjamins and Brown 2004; Felix Aaron et al. 2003). For example, religious attendance and salience are both positively related to cholesterol screening and flu shot rates (Benjamins 2005; Benjamins and Brown 2004). Much less research has investigated the connection between religion and colorectal cancer screening, though at least once study has found that religiously involved individuals are more likely to report such a screening (Kinney et al. 2005).

Although many of the most recent studies examining the role that religion might play in facilitating the use of preventive services are based on nationally representative samples (from the US and Mexico) with numerous relevant control variables, they also share several important limitations. First, most research is limited to adults over 50 years of age. Because certain preventive services such as cholesterol screenings are also recommended for individuals under age 50 by the USPSTF (USPSTF 2010), it would be valuable to investigate determinants of utilization among adult samples with a broader age range. In addition, the lion's share of research on religion and preventive care has focused on women's health issues, particularly breast and cervical cancer screenings. Information about the relationship (or lack thereof) between religious involvement and other types of preventive care services is still needed. Finally, and most importantly, most previous studies employ datasets that contain only a very limited set of religion measures. This has made it impossible to investigate possible explanations for observed links between religious involvement (especially attendance at services) and the use of preventive health services.

It is important to study possible psychosocial determinants of vaccinations and screenings because of their role in improving individual and population-level health. To begin, periodic screenings for high levels of cholesterol are recommended for adults over 35 or for those over 20 with other risk factors for heart disease (USPSTF 2010). An elevated level of cholesterol is a major cause of heart disease, which is the number one cause of death for Americans (Kung et al. 2008; NCEP Report 2001). It has been estimated that a 10 percent decrease in total cholesterol levels could result in up to a 30% reduction in the incidence of coronary heart disease (MMWR 2000). It is also recommended that adults receive a yearly immunization against influenza (CDC 2010). Seasonal influenza causes approximately 200,000 excess hospitalizations each year, as well as 36,000 deaths (Thompson et al. 2003, 2004). In fact, it is the most common vaccine-preventable cause of death in the US. Getting an annual flu shot reduces hospitalizations, upper respiratory infections, physician visits, and sick days, yet vaccination rates are low even for those at highest risk (Tosh et al. 2010). Furthermore, it is recommended by the US Preventive Service Task Force that middle age and older adults are screened for colorectal cancer using fecal occult blood testing, sigmoidoscopy, or colonoscopy (USPSTF 2010). Colorectal cancer is the third most common cancer diagnosed in Americans and the second leading cause of cancer mortality in the US (ACS 2010). Screening for this type of cancer is important because polyps can be found and removed before they can develop into cancers and also because cancers found early are easier to treat and cure (ACS 2010).

Our study contributes to the research literature by exploring the effects of religious attendance on the use of three preventive services and examining whether congregational support processes and/or health-related religious beliefs help to explain this possible relationship in a recent nationwide sample of members of the Presbyterian Church (USA). Although certain characteristics of this dataset (such as high levels of religious involvement, above average socioeconomic status, and above average levels of preventive service utilization) may result in ceiling effects and a reduced likelihood of detecting significant patterns due to limited variation, it provides an unprecedented opportunity to test our specific hypotheses. Specifically, to our knowledge, this is the only source of data that contains information on both the behavioral health outcomes and multiple dimensions of congregational support and religious beliefs. Thus, it will offer new information on potential linkages between aspects of religion and behavioral health and may help to shed light on the broader relationship between religion and health.

## Theoretical background

It is now well-established that religion is a complex, multifaceted domain (Hill and Pargament 2003; Idler et al. 2003). Researchers often distinguish between distal religious constructs, i.e., generic, behavioral indicators such as the frequency of attendance at religious services, and more proximal religious constructs, which can account for the observed links between distal measures and health (Ellison and Levin 1998; Mahoney et al. 1999). Thus, an increasing number of studies develop theoretical arguments linking distal and proximal dimensions of religion with specific health behaviors or outcomes, and attempt to empirically model the interplay between these variables. The current study seeks to add to this growing body of work by attempting to answer the question of why persons who attend religious services regularly might also be more likely to use preventive health services.

Although existing studies do not answer this question directly, several specific mechanisms have been suggested or implied by previous studies. One important set of factors involves the social networks and interactions that take place within religious congregations. For example, a growing literature describes and/or evaluates the efforts of churches that offer health-related classes and programs (Campbell et al. 2007). Such programs have been designed to address a range of modifiable risk behaviors, including precursors to heart disease, cancer, and obesity, among others (e.g. DeHaven et al. 2004; Fox et al. 1998; Kumanyika and Charleston 1992; Wiist and Flack 1990). The foci of church-based health initiatives range from the dissemination of health-related information to the actual sponsorship of health services, such as blood pressure or cholesterol screenings. Although the provision of such services is often more effective in reaching and influencing congregation members than less direct educational initiatives, service provision can require more resources. Perhaps for this reason, the available evidence suggests that the provision of health services by religious congregations is relatively uncommon (Trinitapoli 2005; Trinitapoli et al. 2009).

In addition to such direct programmatic efforts, churches may promote an environment that is conducive to health in any number of other ways. For example, clergy members may foster health awareness by preaching sermons about well-being, or by encouraging participation in sports, family outdoor activities, or other “wholesome” pursuits. Congregations may also start informal groups such as exercise classes, or may open their doors to external groups like Weight Watchers. Taken together, the discussion to this point suggests our first two study hypotheses:

**H1** Persons who attend religious services regularly will be more likely to use preventive health care than individuals who attend services sporadically or not at all.

**H2** Persons in congregations that sponsor health education efforts (e.g., sermons, classes, printed materials) or health services will be more likely to use preventive health care than other persons.

Further, informal social networks among coreligionists may also shape the use of preventive services. It is now well-established that religious congregations are characterized and sustained by social ties (Cornwall 1987; Olson 1993). Because churches often bring together individuals who share common values and interests, and because members may retain their affiliation over a long period, they may form durable friendships with coreligionists (e.g., Olson 1989). On average, persons who attend services regularly enjoy larger social networks, more frequent interaction, more frequent receipt of (and more types of) instrumental and socioemotional assistance than their counterparts who attend less often (Bradley 1995; Ellison and George 1994; Taylor and Chatters 1988). Regular attenders also tend to perceive their networks as more reliable and satisfying than other persons (Ellison and George 1994). Recent work documents the importance of religious communities as sources of various types of formal and informal assistance, and demonstrate the effects of congregational support systems on the physical and mental health of members (Krause 2008). To date, much of this research has highlighted the role of church-based networks as sources of (a) specific types of enacted support, notably instrumental aid (e.g., goods and services) and socioemotional assistance, and (b) anticipated support, or the expectation that one’s fellow worshipers would supply help in the event such assistance was needed (Krause 2008).

However, it is reasonable to anticipate that church-based social relations may also provide other types of health-related assistance. Specifically, coreligionists may be important channels of information about health matters, although no empirical support for this could be found. For example, through informal conversations with fellow members, individuals may gain new insight about the etiology of health problems, and they may learn about the health status of others. They may also receive pointed advice from coreligionists about the need for preventive care, and the risks of failing to take proper care of their physical well-being. Such exchanges may spur them to take precautionary steps, such as modifying diet or exercise patterns, monitoring indicators of physical functioning (e.g., cholesterol), or consulting health care providers. 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 (Cohen 2004;

Lewis and Rook 1999). In addition, church members may provide helpful tips about medicines, procedures, physicians or clinics, or other specific issues. Such information may take the form of positive recommendations or critical assessments of specific health care providers.

Within middle- or upper-SES religious groups, congregational involvement may pay yet another health dividend: Members may be more likely to encounter health care providers (i.e., doctors or nurses) directly, simply because they, too, may attend more affluent congregations. Such direct contact with medical professionals may increase one's confidence in, or comfort with, the health care system, as well as allowing for occasional casual conversations about health topics.

Religious congregations can also provide normative guidance for individual members, which may shape health behaviors in positive directions (Hoffmann and Bahr 2005). These health-related messages may be conveyed by clergy members, via sermons or pastoral letters published in church bulletins. They may also come from casual conversations with coreligionists, who may sanction (e.g., chide, admonish, or gossip about) fellow members who engage in negative health behaviors, especially those behaviors—such as heavy drinking, gluttony, or sexual promiscuity—that conflict with church doctrines or teachings (Grasmick et al. 1991). In addition, within informal interactions, lifestyle changes such as dieting, exercise, or abandonment of unhealthy habits may be rewarded with positive feedback. In addition, religious communities may be sources of role models or reference groups; members may voluntarily modify their health behaviors to emulate persons they admire, and with whom they identify (e.g., Cochran and Beeghley 1991). Such positive recognition may be extended to those who take good care of their health and physical well-being, or who monitor and control chronic conditions in ways that enhance their quality of life. One recent study supported the importance of these interactions. Specifically, exposure to fellow congregants' messages discouraging excessive drinking was associated with less drinking (Ayers et al. 2009). In sum, the foregoing discussion suggests several additional hypotheses:

**H3** The frequency of discussions about health problems or issues with fellow church members will be positively associated with the use of preventive services.

**H4** Individuals who are aware of health care providers in their congregations will be more likely to use preventive services than other persons.

**H5** The frequency of encouragement from church members to lead healthier lifestyles will be positively associated with the use of preventive services.

In addition to the possible role of congregational networks and social ties, there are also sound reasons to anticipate that specific constellations of religious beliefs may be linked with health behaviors in general, and with the use of preventive health care in particular. To date, however, few empirical studies have directly explored this issue. In one exception, Benjamins et al. (2006) analyzed data from a nationwide sample of Presbyterians conducted in 1991, and found modest evidence that women who believe in a connection between spiritual and physical health are more likely to utilize mammograms to screen for possible breast cancer than other women. However, much more work remains to be done to clarify the possible links between religious beliefs and preventive care use.

One promising area of investigation involves the notion that the physical body is a “temple of God,” a phrase that can be traced to the Apostle Paul's (first) letter to the Corinthians (1 Corinthians 6:15, 19–20, New International Version). Although this passage is often mentioned in the religion-health literature (e.g., Ott 1991; Sweet 1994), only recently has this idea been the focus of empirical inquiry. This issue is complex, as religious (and specifically Christian) thought has given rise to a number of diverse perspectives on the physical body, including some schools of ascetic thought that disparage the physical self, and even encourage bodily mortification (Glucklich 2001; Hovard and Sibley 2007; Verhey 1995).

Such divergent theological viewpoints notwithstanding, Pargament, Mahoney, and their colleagues have conceptualized and measured “sanctification,” or the extent to which individuals perceive the divine within a given object or practice, or attribute sacred qualities to that object or practice (Pargament and Mahoney 2005). In a series of studies they have explored the patterns, correlates, and sequelae of the sanctification of marital and family relationships, the natural environment, and others. One of these studies is especially germane to the present investigation. In that work, Mahoney et al. (2005) found that sanctification of the body was an independent predictor of a composite measure of positive health practices in a sample of college students. However, another recently published study using the same data set as the current 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). Although the findings of this new line of work are somewhat contradictory, given the weight of theoretical arguments, we anticipate that individuals who assign greater spiritual significance to the physical self will be more prone to report regular preventive care than other persons.

A second type of religious belief that may influence preventive care centers on the degree of God's control over physical health and illness, as opposed to the degree of

one's personal agency and responsibility in such matters. A long tradition of research has concluded that, in general, individuals with external locus of control, i.e., those who believe that powerful others control their fate, tend to fare poorly in a number of ways, and are often less inclined to take proactive measures in various domains of life experience than individuals who perceive a high level of personal efficacy or control (Rodin 1990; Zarit et al. 2003). However, the place of perceived control by God in the locus of control literature has been ambiguous, and some researchers have argued that persons with a strong perception of God's control may enjoy favorable outcomes, especially compared with their counterparts who attribute control to other (i.e., non-religious) external forces. Thus, in recent years health researchers have focused attention on conceptualizing and measuring a God locus of health control, or the belief that God ultimately determines the course of one's health and well-being (Wallston et al. 1999; Holt et al. 2003a). Due to differences in measurement strategies, samples, and outcomes examined, the findings to date are complex and defy easy summary. However, there is at least some evidence from quantitative and qualitative studies supporting the claim that persons believing in a high level of divine control—especially, but not exclusively, in the domain of health—may exhibit more desirable psychosocial outcomes, and perhaps better health behaviors, than others (Abrums 2000; Holt et al. 2003a, b; Johnson et al. 2005; Schieman et al. 2006; Wallston et al. 1999; Weldon et al. 1996). These twin lines of argument suggest our final hypothesis:

**H6** Believing in the sanctity of the physical body and in God's control of personal health will be positively associated with the use of preventive services.

## Methods

### Data

Data come from a national panel survey conducted among individuals affiliated with the Presbyterian Church (USA). The first wave (administered in 2005) includes information on a variety of topics, including demographic characteristics, socioeconomic status, and religious involvement. In addition, we use data from the fifth wave (collected in 2007), which included a health supplement to measure numerous health-related activities and beliefs, for the health care utilization outcomes. The sample was selected from two groups: (1) active elders and (2) other active members. (Elders are not members of the clergy, rather they are laypersons who have been elected to a leadership

position.) The individuals in each sample were mailed an initial questionnaire in the fall of 2005. Only those responding to that survey were included in the panel (1,163 elders; 1,099 members). Because of attrition, the number of participants in each panel sample had declined slightly by the fifth wave. Specifically, 61% (693 of 1,135) of elders and 53% (557 of 1,037) of the regular members responded (Research Services 2006). After exclusions for missing data, the final sample size for the current study is 1,076. For a complete description of the survey and methodology, see The Presbyterian Panel 1991–1993 Background Report (1990).

### Measures

#### *Primary dependent variables*

The primary dependent variables represent three preventive services that are applicable for both male and female adults, including cholesterol screening, flu shot, and colonoscopy. For each, individuals were asked, "How long has it been since you had a...?" For cholesterol screening and flu shots, individuals who reported one in the past year were compared to those for whom it had been longer or never. For colonoscopy, individuals who had ever had one were compared to those who had not. Reference categories were selected to match current recommendations as closely as possible so that the models predict which individuals follow existing best practices.

#### *Primary independent variable*

*Religious service attendance* This variable distinguishes between those who report attending religious services at least once a week, nearly weekly, or monthly or less (reference).

#### *Possible religious mediators*

*Church-based health activities* We created a measure of health activities sponsored by the congregation. Respondents were asked: "During the past 12 months... (a) Has someone given a sermon at your church that included the topic of health or health-related activities? (b) Has your church held any classes or informal groups related to health issues? (c) Has your church distributed any printed material related to health issues? (d) Has your church sponsored any programs or services related to health care? (e) Have you received a recommendation for a certain doctor, dentist, optometrist, clinic, or other health-care provider from someone at your church?" Each item was coded 1 = yes, 0 = no; answers were summed to create a measure of the

number of types of health activities sponsored by the respondent's church.

*Health discussions with church members* Support is measured in terms of the frequency of health-related discussions with fellow church members. Respondents were asked: "During the past 12 months, how often have you (a) discussed your own health-related problems with someone at your church? (b) discussed someone else's health-related problems with someone at your church?" Response categories were 1 = never, 2 = rarely, 3 = sometimes, 4 = often. The two items were correlated at  $r = .49$ ,  $P < .001$ ; answers were summed to create an index of the frequency of health-related discussions.

*Church support for a healthy lifestyle* This scale measures the amount of support for healthy behaviors from fellow church members. The specific items ask: (a) How often does someone in your congregation encourage you to exercise, avoid cigarettes and alcohol, or eat healthy foods? (b) How often do you look up to someone in your congregation because that person leads a healthy lifestyle? (c) How often do you feel as though a fellow church member has actually changed the way you live by helping you do things like eating better, exercising, or avoiding tobacco? The three items were coded as 1 = never, 2 = once in a while, 3 = fairly often, and 4 = very often. The items were summed to create the scale (Cronbach's  $\alpha = .74$ ).

*Health providers within respondent's congregation* Individuals were asked whether there were any nurses or physicians in their church congregation. This was coded 1 = yes, 0 = no.

*Sanctity of the body* Respondents were asked to indicate their (dis)agreement with each of the following statements: (a) My body is a temple of God. (b) God uses my body to do God's will. (c) My body is a gift from God. (d) My body is created in God's image. Answers were coded 1 = strongly disagree, 2 = disagree, 3 = tend to disagree, 4 = neutral or not sure, 5 = tend to agree, 6 = agree, 7 = strongly agree. Responses were summed to create a scale tapping beliefs regarding the sanctity of the body ( $\alpha = .90$ ).

*God locus of health control* This scale includes six items, such as "God is directly responsible for my health getting better or worse" and "God is in control of my health."

Response choices were identical to those for the sanctity of the body scale and were summed to create the index ( $\alpha = .91$ ).

### Controls

*Demographic and socioeconomic variables* The demographic control variables include: gender (1 = female, 0 = male); age (continuous); race/ethnicity (1 = white, 0 = non-white); and marital status (1 = married, 0 = not married). The socioeconomic variables include education and access to care. Education is measured with a three-category variable (less than a college degree, a college degree, and at least some graduate work), with the lowest level serving as the reference group. Access to care is measured with a question that asks respondents whether they have health insurance problems and have neglected seeking care during the past 5 years as a result. Individuals with no problems (reference group) are compared to those with occasional problems (once or just a few times) and those with chronic problems (several occasions).

*Other controls* Planfulness is included as a measure of disposition that could be associated with both religious involvement and use of preventive services. For this measure, we included several items from the Barratt Impulsiveness Scale: (a) I am a careful thinker. (b) I like to think about complex problems. (c) I plan tasks carefully. (d) I plan trips well ahead of time (Patton et al. 1995). Each item was coded as follows: 1 = rarely/never; 2 = occasionally; 3 = often; 4 = always/almost always. Responses were summed to create an index of planfulness ( $\alpha = .65$ ). In addition, a variable measuring trust in one's physician was included. Respondents were also asked about the presence of health care providers within their immediate family, extended family, close circle of friends, or casual network of acquaintances. Finally, the full models include a measure of self-rated health, which distinguishes those with poor or fair health from those with good or excellent health (reference).

### Statistical methods

First, descriptive statistics, including mean (or proportion), range, and standard deviation are determined, as appropriate, for all variables to be used in the analyses. Then, unadjusted correlations for the religion measures and the preventive service outcomes are calculated. Spearman correlations are calculated for ordinal predictors with the dichotomous outcomes. Chi-square tests are used for relationships between two dichotomous variables. Finally, logistic regression models provide unadjusted and adjusted

estimates for the associations between the various religion variables and the dichotomous preventive service outcomes. Hierarchical models are run to identify potential mediators. Missing data do not pose a significant problem for most predictor variables and the small numbers of missing values are handled via listwise deletion. All analyses were completed using SAS 9.1 (SAS Institute, Cary, NC).

## Results

### Descriptive statistics

Descriptive statistics for all variables are shown in Table 1. Individuals in this sample report high levels of church attendance, with over one-third attending weekly. Congregational support variables indicate moderate levels of support. For example, churches are offering between one and two health-related services. On average, respondents report health-related discussions with other church members occurring rarely to sometimes. However, the vast majority of PC(USA) Panel Survey respondents know of a nurse or physician among their congregation. Support for a healthy lifestyle happens only once in a while or less. In terms of religious beliefs related to health, the average respondent shows support for beliefs regarding the sanctity of the body, with the mean score being nearly 23 out of a possible 28. In addition, respondents fell near the middle of the God locus of control scale indicating that they were neutral or tended to disagree with statements regarding God's control of their health.

Similar to results shown in previous studies using these data (e.g. Benjamins et al. 2006), a high level of preventive service utilization was found. Specifically 77% of all respondents reported having a cholesterol screening within the previous year, 66% had a flu shot within the preceding year, and 67% reported ever having a colonoscopy or sigmoidoscopy. Demographically, a majority of respondents were female (57%) and currently married (78%), with a college degree (68%). Only small percentages of the respondents were non-white or reported having any problems with health insurance that might have compromised their access to preventive care. The average respondents was approximately 60 years old. In terms of the other possible determinants of preventive service use considered in this study, in the current sample most respondents scored in the top quarter of the range of our planfulness scale, and most respondents also reported moderate levels of trust in their physicians. Only 14% described their health as fair or poor. On average, respondents reported having health professionals within at least two social network arenas,

**Table 1** Descriptive statistics for religious variables, preventive services, and covariates ( $n = 1,076$ )

	Range	Mean or proportion	SD
<b>Church attendance</b>			
Monthly or less	0–1	.18	
Nearly weekly	0–1	.47	
Weekly	0–1	.34	
<b>Congregational support</b>			
Church-based health activities	0–5	1.64	1.49
Health-related discussions with church members	2–8	5.02	1.56
Church support for healthy lifestyle	3–12	5.49	1.92
Health providers within church network	0–1	.88	
<b>Religious beliefs related to health</b>			
Sanctity of the body	4–28	22.86	5.04
God locus of health control	2–42	18.37	7.85
<b>Preventive service outcomes</b>			
<b>Cholesterol screening</b>			
Past year	0–1	.77	
<b>Flu shot</b>			
Past year	0–1	.66	
<b>Colonoscopy</b>			
Ever	0–1	.67	
<b>Demographic and socioeconomic variables</b>			
Female	0–1	.57	
Age	18–96	59.81	13.54
<b>Race/ethnicity</b>			
Non-White	0–1	.03	
Married	0–1	.78	
<b>Education</b>			
Less than college degree	0–1	.32	
College degree	0–1	.24	
More than college degree	0–1	.44	
<b>Health insurance</b>			
Occasional problems	0–1	.11	
Chronic problems	0–1	.04	
<b>Other controls</b>			
Planfulness	4–16	12.42	2.14
Fair or poor self-rated health	0–1	.14	
Trust in one's physician	1–5	3.61	.91
Health providers within social network	0–4	2.37	1.12

SD standard deviation

e.g., among immediate family, extended family, close friends, casual networks.

The strength and direction of the unadjusted relationships between the primary independent and dependent variables are shown in Table 2. The frequency of attendance at religious services bears significant positive correlation with nearly all of the other religion measures, as

**Table 2** Intercorrelations for religious characteristics and use of preventive services ( $N = 1,076$ )<sup>a</sup>

	1	2	3	4	5	6	7	8	9	10
1. Church attendance	–									
2. Church-based health activities	.04	–								
3. Health-related discussions	.18***	.15***	–							
4. Church support for healthy lifestyle	.13***	.33***	.31***	–						
5. Health providers within church	–.01	.12***	.03	.05	–					
6. Sanctity of the body	.20***	.04	.11***	.12***	.00	–				
7. God locus of health control	.07*	–.05 <sup>+</sup>	.05	.03	–.03	.16***	–			
8. Cholesterol screening	.07*	.04	.11***	.04	.01	–.05 <sup>+</sup>	–.05 <sup>+</sup>	–		
9. Flu shot	.06 <sup>+</sup>	.03	.09**	.01	.02	–.04	–.07*	.23***	–	
10. Colonoscopy	.08**	–.03	.07*	–.04	.04	–.00	–.04	.29***	.26***	–

<sup>a</sup> Spearman correlations or chi-square tests are used, as appropriate

<sup>+</sup>  $P \leq .10$ ; \*  $P \leq .05$ ; \*\*  $P \leq .01$ ; \*\*\*  $P \leq .001$

well as with all three of the preventive service outcomes. Of the other religion measures, only having health-related discussions with fellow church members is positively correlated with the outcomes. The beliefs, particularly the God locus of health control, have a negative relationship with preventive service use.

Regression models

*Cholesterol*

The first three models in Table 3 display the unadjusted associations between the religion variables and cholesterol screening. Church attendance is significantly associated with receiving a cholesterol screening in the past year. More specifically, Model 1 shows that as one increases church attendance from less than weekly to weekly, the odds of a screening in the past year versus one less recently than that (or never) are 1.65 times higher in the unadjusted model ( $P < .01$ ). Of the congregational support measures, Model 2 shows that only the frequency of having health-related discussions with fellow church members is significantly associated with cholesterol screenings (OR = 1.18,  $P < .001$ ). In contrast, the unadjusted regression model estimating the association between religious beliefs related to health and the outcome measure (Model 3) indicates no significant relationships.

The significant associations for attendance and health-related discussions with cholesterol screenings remain unchanged in Model 4. This provides no support for the idea that congregational or beliefs aspects may explain the connection between attendance and service use. In Model 4, there is also a newly significant relationship between religious beliefs related to health and receiving a screening. It is a negative relationship in which a stronger belief in the

sanctity of the body is associated with a lower likelihood of receiving a cholesterol screening (OR = .96,  $P < .05$ ).

Results from the full adjusted regression model are shown in Model 5. The estimates reveal that religious service attendance does not remain significantly associated with the use of cholesterol screening after controlling for demographic and socioeconomic variables. Thus, Hypothesis 1 is not supported by this data. Of congregational support measures, two are significantly related to cholesterol screenings. Specifically, the frequency of having health-related discussions with coreligionists remains predictive of cholesterol screenings with the addition of the demographic and socioeconomic variables (OR = 1.15,  $P < .05$ ). Moreover, the amount of church-based health activities becomes significant in the fully adjusted model (OR = 1.13,  $P < .05$ ). Together, these provide support for Hypotheses 2 and 3. In contrast, knowing health care providers in one’s congregation and reporting support for healthy lifestyles continue to be unrelated to the use of cholesterol screenings. Similarly, the measures of belief (in the sanctity of the body and God locus of health control), which were significant in Model 4, are no longer associated with this type of preventive service use once the demographic and socioeconomic controls and other covariates are added to the model. These findings provide no support for Hypotheses 4–6.

*Flu shots*

Models 1 and 2 follow the same pattern as above. Specifically, in unadjusted models, weekly attendance and more frequent health-related discussions with fellow members are both associated with a greater likelihood of having a flu shot in the past year (OR = 1.43,  $P < .10$ ; OR = 1.13,  $P < .01$ , respectively). In addition, Model 3 reveals that

**Table 3** Estimated effects of religious attendance, congregational support, beliefs, and covariates on cholesterol screening<sup>a</sup>

	Cholesterol screening <sup>b</sup>				
	Model 1	Model 2	Model 3	Model 4	Model 5
Church attendance (low: monthly or less)					
Medium: nearly every week	1.28			1.25	.75
High: weekly	1.65*			1.65*	.95
Congregational support					
Church-based health activities		1.05		1.05	1.13*
Health-related discussions with church members		1.18***		1.18***	1.15*
Church support for healthy lifestyle		.99		1.00	1.02
Health providers within church network		1.00		1.00	.79
Religious beliefs related to health					
Sanctity of the body			.98	.96*	.98
God locus of health control			.99	.99	.99
Sociodemographic characteristics					
Female (male)					.56***
Age (continuous)					1.06***
Race/ethnicity (White)					
Non-White					.47 <sup>+</sup>
Married (not married)					1.08
Education (less than college degree)					
College degree					.97
More than college degree					.75
Health insurance (no problems)					
Occasional problems					.82
Chronic problems					.50 <sup>+</sup>
Other controls					
Planfulness					1.06
Fair or poor self-rated health (good or excellent)					.98
Trust in one's physician					1.21*
Health network					1.04
–2 Log likelihood	1162.97	1154.11	1163.38	1140.88	987.68
N	1,076				

<sup>a</sup>Logistic regression odds ratios<sup>b</sup>Reference group is individuals who did not use the service in the past year<sup>+</sup> $P \leq .10$ ; \*  $P \leq .05$ ; \*\*  $P \leq .01$ ; \*\*\*  $P \leq .001$  (two-tailed tests)

scoring higher on the God locus of health control scale is predictive of a lower likelihood of reporting a flu shot (OR = .98,  $P < .05$ ). All of these relationships remain in Model 4, again suggesting that congregational and belief measures are not the mechanisms linking attendance and preventive service use in this sample. However, when the sociodemographic controls and other covariates are added in Model 5, none remain significant. Interestingly, in this model, a higher level of church-based health activities is the only religious variable significantly related to the use of flu shots. Specifically, each one unit increase in this scale is associated with a 10% increase in the odds of reporting a

flu shot in the past year. Thus, the full model yields support only for Hypothesis 2.

### Colonoscopy

Both levels of religious attendance are significantly associated with reported colonoscopy use, as seen in Model 1. In this unadjusted model, the odds of reporting a colonoscopy are 68% higher for weekly attenders and 44% higher for nearly weekly attenders, compared to those who attend less often. Model 2 shows that those who have more health-related discussions with fellow members are also

**Table 4** Estimated effects of religious attendance, congregational support, beliefs, and covariates on the use of flu shots<sup>a</sup>

	Flu shots <sup>b</sup>				
	Model 1	Model 2	Model 3	Model 4	Model 5
Church attendance (low: monthly or less)					
Medium: nearly every week	1.24			1.23	.82
High: weekly	1.43 <sup>+</sup>			1.46 <sup>+</sup>	.85
Congregational support					
Church-based health activities		1.03		1.02	1.10*
Health-related discussions with church members		1.13**		1.13**	1.07
Church support for healthy lifestyle		.97		.97	.99
Health providers within church network		1.08		1.08	.89
Religious beliefs related to health					
Sanctity of the body			.99	.98	1.00
God locus of health control			.98*	.98*	.99
Sociodemographic characteristics					
Female (male)					1.14
Age (continuous)					1.07***
Race/ethnicity (White)					
Non-White					.74
Married (not married)					1.08
Education (less than college degree)					
College degree					1.11
More than college degree					1.10
Health insurance (no problems)					
Occasional problems					.82
Chronic problems					.52 <sup>+</sup>
Other controls					
Planfulness					1.02
Fair or poor self-rated health (good or excellent)					1.12
Trust in one's physician					1.04
Health network					.98
-2 Log likelihood	1374.77	1493.29	1377.47	1363.87	1383.66
<i>N</i>					

<sup>a</sup> Logistic regression odds ratios

<sup>b</sup> Reference group is individuals who did not use the service in the past year

<sup>+</sup>  $P \leq .10$ ; \*  $P \leq .05$ ; \*\*  $P \leq .01$ ; \*\*\*  $P \leq .001$  (two-tailed tests)

more likely to report having had a colonoscopy. These relationships remain when all of the religion measures are included simultaneously (Model 4), but disappear with the addition of the controls and other covariates in Model 5. Only health-related discussions is moderately associated with use of this preventive service, lending support to Hypothesis 3.

Of the demographic variables included in the models, only gender and age were consistently associated with the screening outcomes. Women and younger adults were much less likely than men and older adults to report this type of screening. In fact, it was the addition of age to Model 5 (Tables 3, 4, 5) that reduced the significance of the religion variables, particularly attendance. Few other significant associations were seen for the socioeconomic covariates or the other controls.

**Discussion**

In recent years, a growing body of research has reported positive associations between religious attendance and the use of preventive health services. To date, however, few studies have investigated additional aspects of religion that may explain this relationship or influence health care utilization independently. Our work breaks new ground by: (a) exploring promising explanations for a potential relationship between attendance and preventive service use, especially aspects of congregational support and religious beliefs; and (b) testing relevant hypotheses using data from a recent nationwide probability sample of Presbyterians. Several findings deserve particular discussion.

Our results show that while there is a strong positive association between frequent attendance at religious

services and preventive screenings at the bivariate level, this pattern is eliminated by the inclusion of controls for sociodemographic factors, personality orientations, and other possible confounders and mediators. Thus, our findings are inconsistent with previous studies reporting a significant relationship between attendance and preventive service use (e.g., Benjamins 2005). This apparent absence of an association could reflect the distinctiveness of our denominational sample, in which (a) approximately 80% of respondents attend services almost weekly or more often, and (b) each preventive service was reported by 66–77% of the sample. Interestingly, the data reveal that the lack of a direct effect of religious attendance on preventive services does not result from the inclusion of controls for church-based support processes and religious beliefs. Although it has been suggested that these are mechanisms via which religious attendance may influence the use of preventive care services, our data do not support this.

Despite the lack of support for their role as mechanisms, we do find that two of the four dimensions of church-based support are positively linked with preventive services. Specifically, persons attending congregations with more health activities are more attentive to their health; each one-unit increase in our measure of church-based health activities is associated with a 13% increase in the odds of obtaining cholesterol screening and a 10% increase in the odds of obtaining a flu shot (both within the year prior to the interview), as opposed to obtaining such a service less recently or not at all. Examples of such church-based health activities include health-promoting sermons, classes or informal groups concerned with health issues, dissemination of health education materials, sponsorship of health programs or services, and the sharing of recommendations concerning healthcare providers. Additional analyses (not shown) indicate that this effect is driven by the sum of all activities and not solely influenced by any specific one.

In addition, in these data each one-unit increase in the frequency with which individuals discuss health matters with fellow church members is associated with a 15% increase in the odds of having obtained a cholesterol screening within the previous year. It is also moderately associated with an increased odds of reporting a colonoscopy. These empirical patterns underscore the potential importance of informal conversations with coreligionists as a source of valuable information about health problems, prevention strategies, and healthcare providers. For example, individuals may learn about others' experiences, and this may serve as a reminder to undergo certain tests. Indeed, they may be encouraged directly by church members to seek preventive care. Congregants may also offer more general information about the benefits of certain types of tests and services, as well as recommendations about which providers to contact—and which ones to

avoid. Health discussions may also extend to cautionary tales about the unpleasant consequences of failing to take proper preventive steps, e.g., updates about the health problems of others. However, further research is needed to clarify which types of health-related discussions are most influential, as well as the ways in which micro-level processes function to spread information about preventive service options and influence health behavior.

As noted above, several investigators have also speculated that specific religious beliefs may underlie the associations between attendance and health behaviors that have been observed in previous studies. Building on these suggestions, we examined the roles of (a) the “sanctification of the body,” or the belief that the body is sacred (e.g., “my body is the Temple of God”) and (b) the belief that God is in control of individual health as predictors of preventive care use. Although religious beliefs may support other aspects of healthy lifestyle and positive health behaviors, the findings reported here cast doubt on the links between these two important sets of religious beliefs and the use of preventive services in this population. Not surprisingly given this lack of association, they also do not account for the relationship between attendance and preventive service use.

Our study is characterized by several notable limitations. To begin, all data, including the behavioral health outcomes, are self-reported. In addition, although our analyses control for variations in planfulness, we cannot rule out the possible influence of unmeasured personality factors or other predispositions in shaping both religious behaviors and preventive service use. Furthermore, because PC(USA) members and elders differ from the average American in levels of education, income, and other aspects, it is difficult to generalize our findings to other religious communities (except, perhaps, to other Mainline Protestant groups), or to the broader adult population. The fact that significant associations were found in this population with high religiousness and minimal variance in the preventive service outcomes may imply that our study underestimates the “true” religious effects on health behaviors that would be found in a more heterogeneous sample.

Another potential limitation is attrition between the first and fifth waves; however, several extensive reviews recently completed by survey experts conclude that lower response rates do not necessarily lead to nonresponse bias (Groves 2006; Holbrook et al. 2007). Finally, it is worth noting that the role of specific religious factors in shaping the use of preventive services may differ for healthy, community-dwelling samples as compared with clinical samples. For example, it is conceivable that congregational support is less important for clinical samples, due to limited mobility and other factors, than for community-dwelling persons. Such differences deserve attention in future work.

**Table 5** Estimated effects of religious attendance, congregational support, beliefs, and covariates on the use of colonoscopy<sup>a</sup>

	Colonoscopy <sup>b</sup>				
	Model 1	Model 2	Model 3	Model 4	Model 5
Church attendance (low: monthly or less)					
Medium: nearly every week	1.44*			1.43*	.94
High: weekly	1.68**			1.70**	.92
Congregational support					
Church-based health activities		.96		.95	1.01
Health-related discussions with church members		1.14**		1.12*	1.10 <sup>+</sup>
Church support for healthy lifestyle		.94 <sup>+</sup>		.93 <sup>+</sup>	.94
Health providers within church network		1.34		1.36	1.14
Religious beliefs related to health					
Sanctity of the body			1.00	1.00	1.02
God locus of health control			.99	.99	.99
Sociodemographic characteristics					
Female (male)					.59*
Age (continuous)					1.07***
Race/ethnicity (White)					
Non-White					.52
Married (not married)					1.17
Education (less than college degree)					
College degree					.98
More than college degree					.81**
Health insurance (no problems)					
Occasional problems					.97
Chronic problems					.44
Other controls					
Planfulness					1.09
Fair or poor self-rated health (good or excellent)					1.02
Trust in one's physician					1.21
Health network					1.03
-2 Log likelihood	1349.61	1344.89	1355.48	1335.22	1085.15
N	1,076				

<sup>a</sup> Logistic regression odds ratios

<sup>b</sup> Reference group is individuals who have never used the service

<sup>+</sup>  $P \leq .10$ ; \*  $P \leq .05$ ; \*\*  $P \leq .01$ ; \*\*\*  $P \leq .001$  (two-tailed tests)

Although we have tested several interesting and important hypotheses about possible mechanisms linking religious attendance with preventive care utilization, there is considerably more work to be done in this area. For example, it is possible that character strengths derived from religious faith and practice—such as the sense of meaning, or feelings of gratitude, or the capacity for self-regulation—may also help to explain the relationship between attendance at services and the proactive use of health care services (Peterson and Seligman 2004; McCullough and Willoughby 2009). The psychology of religion literature also offers several core constructs, such as intrinsic versus extrinsic religious motivation (Hill and Pargament 2003), although data limitations preclude examination of these factors in this sample.

Despite these and other limitations, we believe this research makes a significant contribution to the burgeoning research literature on religion and health and may also help to shape and refine interventions that will help individuals to lead healthier, and perhaps longer, lives. As investigators continue to document salutary effects of religious involvement on health and mortality risk (Koenig et al. 2001; Hummer et al. 2004), and to identify various explanatory mechanisms (e.g., Ellison and Levin 1998; George et al. 2002), they would be wise to continue to explore the roles of preventive care use and other aspects of behavioral health in yielding these outcomes. The type of information provided here also has practical implications. For instance, evidence of a connection between church-based health activities and vaccinations and screenings

suggests that tangible forms of support (such as health-related programs and educational materials) are effective ways to improve the utilization of preventive services by members. Furthermore, finding additional ways to foster relationships and stimulate health-related conversations between members of religious organizations may also be beneficial for the congregants' well being. For public health and health care professionals, these findings could provide valuable guidance regarding potential interventions aimed at education and health promotion within religious settings. In conclusion, this study contributes to a more nuanced understanding of the various ways in which religion might impact health behaviors and helps to elucidate the specific mechanisms through which religious organizations can influence the health of their members.

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