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Religious Influences on Preventive Health Care Use in a Nationally Representative Sample of Middle-Age Women

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Despite the many benefits of preventive services, they are often underutilized. Social factors, such as religion, can figure prominently in these discrepancies by either creating barriers or facilitating use. Using data from the Health and Retirement Survey (HRS, 1992–1996), the current study examines the relationship between religious attendance, religious salience, and denomination and three types of female preventive services in a sample of middle-age women ($N = 4253$). Findings indicate that women who attend religious services more frequently use more mammograms, Pap smears, and self-breast exams. In addition, women belonging to Mainline Protestant or Jewish denominations use certain preventive services more than Evangelical Protestants. Finally, women with higher levels of religious salience are more likely to conduct self-breast exams. These findings add important information to the public health literature concerning factors that influence preventive service use. They also add to the growing field of religion and health research where preventive health care use is emerging as a possible mechanism linking religion to a wide variety of physical health outcomes.

KEY WORDS prevention; health care; religion; women's health.

INTRODUCTION

Preventive service utilization levels vary widely within the U.S. population. Individuals who are poor, uninsured, older, less educated, not married, or members of racial or ethnic minority groups often use fewer preventive services (Breen *et al.*, 2001; CDC, 1999; Coffield *et al.*, 2001; Drociuk, 1999; Hayward *et al.*, 1988; Janes *et al.*, 1999). These disparities may reflect the reasons often given for low levels of use, including issues of limited access, information, and motivation (Drociuk, 1999; Amonkar *et al.*, 1999). Social factors can figure prominently in these discrepancies by either creating barriers or facilitating use. Religion, one of the most important social institutions for adults in the United States (Gallup, 1997), may affect preventive service utilization through its influence on individual lifestyles, worldviews, and motivations. In fact, religious beliefs and activities have been shown to be associated with numerous other health behaviors such as smoking, drinking, drug use, and diet, as well as with general health care use (for reviews, see Koenig *et al.*, 2001; Schiller and Levin, 1988).

It is reasonable to assume that religion may also affect preventive service use. Unfortunately, the studies that have addressed this question have been hampered by methodological limitations, such as cross-sectional data (Miller and Champion, 1993; Miller *et al.*, 1980; Murray and McMillan, 1993; Naguib *et al.*, 1968; Yi, 1994, 1998), nonrepresentative samples (Miller and Champion, 1993; Miller *et al.*, 1980), and limited measures of religion (Miller and Champion, 1993; Miller *et al.*, 1980; Murray and McMillan, 1993; Yi, 1994, 1998). The present study will improve upon this literature by considering the effects of religious attendance, religious denomination, and religious salience on the utilization of three different types of female preventive

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services (mammograms, Pap smears, and self-breast exams) within a nationally representative sample of pre-retirement age women.

PREVIOUS STUDIES

Religion is an important social factor to consider, especially in the United States where 92% of adults identify with a specific religious preference. Perhaps even more notable is the fact that approximately 60% of adults say that religion is a *very* important part of their lives (Gallup Organization, 2004; Princeton Religion Research Center, 1994). Individual rates of participation in religious activities are also high. For example, religious attendance rates have been steady over the past 50 years with 40% of individuals reporting that they attend religious services weekly (Gallup Report, 1987; Princeton Religion Research Center, 1994). Participation in private religious activities is common as well, with nearly 90% of individuals reporting that they pray and almost half reporting that they have watched religious programs on television (Gallup Report, 1987).

The salience of religion to many individuals, as well as the extent of their involvement with religious organizations and activities, enables religion to be influential within a wide range of domains. For example, previous studies have found that religion predicts behaviors within various realms, including socioeconomic status, politics, deviance, and family, among others. More specifically, religion is related to educational attainment (Darnell and Sherkat, 1997; Lehrer, 1999), income (Homola *et al.*, 1987; Roof, 1979; Smith and Faris, 2005), political beliefs (Kiecolt and Nelsen, 1988; Patterson, 2004), criminal activity (Evans *et al.*, 1995), marital stability (Call and Heaton, 1997; Lehrer and Chiswick, 1993), and fertility (Lehrer, 1996; Mosher *et al.*, 1986). With the influence of religion extending into this many diverse areas, it is not surprising that it also predicts health-related outcomes and behaviors.

In fact, there is a long history of research on the connection between religion and health. For example, the relationship between religion and mortality was first documented by noted sociologist Emile Durkheim in 1897 (Durkheim [1897], 1951). Over the past several decades, a growing number of studies have focused on a wide array of physical and mental health outcomes. Overall, more than 1000 studies have examined some aspect of this relationship (Koenig *et al.*, 2001). Religious variation has been found in physical health outcomes such as self-rated health, functional limitations, recovery from illness, and mortality (e.g. Hummer *et al.*, 1999; Idler and Kasl, 1997; Levin and Markides, 1985; Musick, 1996; Oman and Reed, 1998; Strawbridge *et al.*, 1997) and mental health outcomes such as life satisfaction, overall well-being, depression, and anxiety (e.g. Ellison, 1995; Koenig *et al.*, 1988, 1994; Levin and Chatters, 1998). The majority of these studies find a salutary relationship between religion and health in which greater levels of religious involvement or salience are associated with better health outcomes.

One frequently hypothesized explanation for this relationship is that religious individuals behave differently. Previous studies have shown that levels of smoking, drinking, sexual promiscuity, diet, and other behaviors vary by religious denomination, service attendance, and religious salience (e.g. Koenig *et al.*, 1998; Krause, 2003; Musick *et al.*, 2000; Nonnemaker *et al.*, 2003; Whooley *et al.*, 2002). Moreover, studies have also found that religion is associated with numerous health care related factors, such as the use of physician services, hospital visits, and even dental services (for reviews, see Koenig *et al.*, 2001; Schiller and Levin, 1988). In the past several decades, studies examining the relationship between religion and preventive health services have also begun to appear.

These studies have generally found significant differences in preventive service utilization by religious denomination and religious service attendance. Perhaps the most recent study to date examined the influence of religious salience and denomination on six different types of preventive services for U.S. adults over 70 years of age (Benjamins and Brown, 2004). The results showed that individuals within this age group who report high levels of religious salience were more likely to use flu shots, cholesterol screening, Pap smears, and prostate screenings compared to those with lower levels of religious salience. Similarly, compared to non-affiliated individuals, those claiming membership in some religious organization were more likely to report the use of all of the preventive services listed earlier, as well as breast exams and mammograms. Of the denominations included in the study, Judaism was most significantly associated with increased preventive service utilization (Benjamins and Brown, 2004).

Another recent study focused on a wider variety of religion variables, including church attendance

and self-rated religiosity; however, these variables exhibited no significant effects on breast cancer screening in this church-based sample of Los Angeles women (Fox *et al.*, 1998). In addition, a study examining the impact of religious service attendance, affiliation, and salience on the use of cholesterol screenings by older adults found that more frequent attenders and those belonging to mainline Protestant denominations were most likely to report screenings (Benjamins, 2005). Finally, a study of residents in a low-income African-American neighborhood found that church attendance was positively related to having a blood pressure measurement in the past year (Felix Aaron *et al.*, 2003).

Beyond these studies, the majority of the prior research in this area focuses on denominational differences in female preventive service utilization. Most findings show that breast and cervical cancer screening utilization rates differ by religious affiliation (Miller and Champion, 1993; Miller *et al.*, 1980; Murray and McMillan, 1993; Naguib *et al.*, 1968; Yi, 1994, 1998). Although numerous studies have examined this issue, they generally limit the denominations studied to Catholic, Protestant, or Other, and there are conflicting findings regarding which denominations are more likely to use these health services.

In addition to the lack of consensus regarding the relationships between religion and preventive service use, the majority of the previous studies have methodological limitations that reduce the usefulness of their findings. For example, many of the studies use cross-sectional data (Felix Aaron *et al.*, 2003; Miller and Champion, 1993; Miller *et al.*, 1980; Murray and McMillan, 1993; Naguib *et al.*, 1968; Yi, 1994, 1998), convenience samples (Miller and Champion, 1993; Miller *et al.*, 1980), or samples restricted to age ranges that are not ideal for the study of preventive service utilization (Benjamins and Brown, 2004). In addition, most examine a single measure of religion (Felix Aaron *et al.*, 2003; Miller and Champion, 1993; Miller *et al.*, 1980; Murray and McMillan, 1993; Yi, 1994, 1998) and no studies were found that investigated detailed denominational differences in preventive service utilization in the United States. Finally, few studies have attempted to discover the factors that may mediate this relationship. The current study addresses these issues by using a longitudinal, nationally representative sample of pre-retirement aged U.S. adults. Within this sample, three conceptually distinct measures of religion are tested as predictors of female preventive service utilization, as discussed later.

THEORETICAL FRAMEWORK

Three measures of religion are included in the current study: religious service attendance, religious denomination, and religious salience. Each of these facets is expected to influence preventive service utilization, and possible explanations for these relationships are offered later. Although more extensive measures of religion are available in the literature (see Idler *et al.*, 2003), these single question measures are the only religion variables included in the Health and Retirement Survey (HRS). However, it is important to note this data set was chosen specifically because it had the widest range of religion measures, along with information on preventive service utilization rates, among nationally representative, public use data sets.

Religious Service Attendance

One important aspect of religion entails involvement with a religious organization. Religious service attendance is one form of involvement and it may affect preventive service use in several ways. For example, churches and synagogues frequently offer activities or information about health promotion topics that may lead (directly or indirectly) to greater use of health services. Other types of related programs include health education campaigns and transportation services to health care providers. Numerous studies provide evidence supporting the effectiveness of religious programs in promoting healthy behaviors and lifestyles (Davis *et al.*, 1994; Erwin *et al.*, 1999; Fox *et al.*, 1998; Lasater *et al.*, 1986; Levin, 1984; Voorhees *et al.*, 1996). Church-based networks, informal discussions, and support systems originating within the congregation may also play a role. Possibly as a result of these church-based programs and the more extensive social networks of members, individuals with higher levels of church attendance have significantly more knowledge about health maintenance activities (Apel, 1986). Each of these resources, alone or in combination, is expected to translate into greater use of preventive health care services by those who attend religious services more frequently.

Religious Denomination

It is also expected that denominational differences will be found. It is important to note that it

is not exclusively theological differences that drive variations between denominations, but a combination of theology, group norms brought about by individual interactions, and organizational differences between denominations (and congregations) (White, 1968). Theological differences may arise directly from the scriptures of a particular denomination or indirectly through interpretations. Group norms that exist within cultural subgroups (such as religious denominations) may also potentially influence how members understand health, disease etiology, and treatments (Jacobs and Giarelli, 2001; Turner, 1996). Finally, organizational differences may arise if the leaders (or members) of a certain denomination or church initiate programs or policies related to the health of their members. However, due to the conflicting findings in previous studies of denominational differences in preventive service use and to the absence of detailed denomination information in past studies, directional hypotheses for this aspect of religion cannot be made.

Religious Salience

The final measures of religion, religious salience, is included to capture the possible effects of personal beliefs, faith, and commitment on preventive service use. In contrast to the two previous aspects of religion, which are more social in nature, religious salience is a measure of a private experience with relevance to personal values. Several studies have shown that religious salience is negatively related to a wide range of health-related behaviors, including smoking, drinking, and promiscuity (Assanangkornchai *et al.*, 2002; Nonnemaker *et al.*, 2003; Krause, 2003). Furthermore, religious salience has been shown to predict a wide array of preventive services in a sample of older adults (Benjamins and Brown, 2004). It is possible that factors such as better mental and physical health, a belief in moderation, constraint, and regularity, or feelings of responsibility to a higher being mediate these relationships. In contrast, religious salience may also have a negative influence on health behaviors. Previous researchers have theorized that believing in the afterlife may undermine the importance of preventive services. If individuals believe that life continues after death and, perhaps more significantly, that life in the next world is more important, activities designed to improve their health or decrease their mortality risk may be less important (Wynder and Sullivan, 1982). However, based on previous findings, it is expected that the positive influences of religious salience will outweigh the negative ones and, thus, higher levels of religious salience will be related to greater use of preventive services.

Possible Mediators

Most simplistically, mediators are variables that help to explain the relationship between the independent variables and the outcomes. More specifically, a variable can be said to be a mediator if the following conditions are met: (1) the independent variable is significantly associated with the proposed mediator; (2) the proposed mediator is significantly associated with the dependent variable; and (3) the relationship between the independent and dependent variables is reduced or eliminated when the mediator is added to the model (Baron and Kenny, 1986). For the current study, two sets of variables—social support and health status—were chosen to be tested as potential mediators between religion and preventive service use due to their theoretical adherence to the first two conditions listed earlier. For example, previous studies have found that religious people have larger social networks and more social support (Bradley, 1995; Ellison and George, 1994). Social support, in turn, has been found to be associated with greater usage of preventive services (Katapoldi *et al.*, 2002). Furthermore, higher levels of religious involvement are associated with better mental health (for review, see Koenig *et al.*, 2001) and physical health (e.g. Hummer *et al.*, 1999; Idler and Kasl, 1997; Levin and Markides, 1985; Musick, 1996; Oman and Reed, 1998; Strawbridge *et al.*, 1997), both of which have been shown to influence the use of health services (Koenig *et al.*, 1989; Simon *et al.*, 1995). Both social support and health status may help to explain a significant relationship between religion and preventive service use and, thus, will be assessed as possible mediators in the following analyses.

Expectations

Based on the previous studies and the theoretical assumptions discussed earlier, several expectations regarding the relationships between religion and preventive service use can be postulated. First, higher levels of religious attendance and religious salience will be associated with greater use of

preventive services. Second, levels of use will vary by denomination. Finally, relationships between the religion variables and preventive service use outcomes will be mediated by social support and health status.

METHODS

Data

Data for the analyses come from the HRS. The HRS is a nationally representative survey of non-institutionalized older adults in the United States (HRS website: http://hrsonline.isr.umich.edu, 2003). This panel study focuses on a wide range of issues critical to an aging society, such as family composition, retirement behavior, and physical and mental health status. The HRS has a multi-stage probability sampling design that includes oversamples for African-Americans, Hispanics, and residents of Florida (Heeringa and Connor, 1995). The sampling procedure consisted of four separate selection stages: probability proportionate to size selection of U.S. Metropolitan Statistical Areas (MSAs) and non-MSA counties, secondary sampling of area segments within the primary stage units, systematic selection of housing units, and selection of the household financial unit within each housing unit. The data was collected by the Institute for Social Research at the University of Michigan. Baseline interviews were conducted face-to-face and follow-up interviews were done every other year by telephone. The individual response rate for Wave 1 was 82% (HRS website, 2003).

Due to the absence of individual-level weights for individuals born before 1931 or after 1941, only females born between 1931 and 1941 were included in the current study ($n = 5037$). Of these women, 4355 (86%) remained in the sample through Wave 3 (1996). Additionally, the analyses were limited to non-Hispanic whites, non-Hispanic blacks, and Hispanics because of the small number of individuals in the other racial and ethnic categories (number excluded = 81). Finally, individuals with missing data for the religion or preventive service utilization variables ($n = 12$ and 9, respectively) were also excluded. The final sample size is 4253 respondents. The religion, control, and potential mediating variables were all measured in Wave 1 (1992), while the preventive service outcomes were measured in Wave 3 (1996). The only exception is that the variable representing religious salience, which was not asked in Waves 1 or 2, was measured in Wave 3 along with the outcome variables. Due to this limitation of the data, separate, cross-sectional models were run for religious salience.

Measures

Preventive Services

There are three female-specific types of preventive services included in this data set: mammograms, Pap smears, and self breast exams. Inquiries about each preventive service began with the following question, "Since we talked to you last in (previous wave interview month and year), have you had any of the following medical tests or procedures?" All preventive service variables are dichotomous with '1' representing utilization and '0' representing non-utilization in the past 2 years.

Religion

The first religion variable measures frequency of attendance at religious services. Response choices are more than once a week, once a week, two or three times a month, one or more times a year, or not at all. Due to the nonlinear relationship between attendance and preventive service use, dummy variables were included in the models with individuals who never attend as the reference group.

The second variable, religious denomination, indicates the group or belief system with which the individual is affiliated. Six denomination categories were created as follows: Catholic, Evangelical Protestant, Mainline Protestant, Jewish, other religion, and nonaffiliated, generally following the classification scheme developed by Steensland and his colleagues (2000). One improvement over previous studies is the separation of Mainline and Evangelical Protestant denominations. Mainline denominations include groups such as Methodists, Lutherans, and Presbyterians, while Evangelical Protestants include more conservative affiliations such as Southern Baptists and Pentecostals. It is speculated that affiliational differences in health beliefs and behaviors may reflect where a denomination fits in the conservative–liberal spectrum. Evangelical Protestantism is the most conservative of the denominations studied here and was, thus, treated as the reference group.

The final religion variable measures an individual's religious salience. The wording of the question

is as follows: "How important would you say religion is in your life: is it very important, somewhat important, or not too important?" Like religious attendance, dummy variables were used to measure these three categories of religious salience. The lowest category of religious salience represents the reference category.

Controls

Variables that may influence the use of preventive services (but are not potentially mediating variables as discussed earlier) were included as controls. Including these variables in the models statistically removes their effect on the dependent variable. Measures of demographic characteristics that are frequently found to be associated with the use of female preventive services, such as age, race/ethnicity, and foreign-born status, fit into this category (Barr *et al.*, 2001; Breen and Kessler, 1994; Hewitt *et al.*, 2002; Kirkman-Liff, 1992; Maise, 2002; O'Malley *et al.*, 1999; Schneider, 2001). Because aspects of socioeconomic status have also been found to predict female preventive service utilization (Hewitt *et al.*, 2002; Kirkman-Liff, 1992; Klassen *et al.*, 2002; Roetzheim *et al.*, 1999) and may be associated with various aspects of religion, the following three measures of socioeconomic resources were also included: education, income, and presence of health insurance.

Mediators

Social support and health status were examined for their role as possible mediators. Marital status (married or not) and satisfaction with family and friends were each included as measures of social support. The quality of friendships and family was measured with a combined item that asks respondents for their overall levels of satisfaction with their friendships and family. Self-rated emotional health and depression were included in the models as measures of mental health status. Self-rated emotional health was measured with the following response choices: excellent, very good, good, fair, and poor (with higher scores indicating worse self-rated emotional health). A shortened version of the CES-D depression scale was used to measure depressive symptoms (Radloff, 1977; Ensel, 1986). More specifically, 11 of the original 20 questions were asked, including questions on sleep quality, happiness, loneliness, and appetite, among others. For physical health status, a variable representing the total number of chronic conditions was included. This count represents the presence of seven common long-term conditions, including hypertension, diabetes, chronic lung disease, arthritis, heart disease, cancer, and stroke. In addition, self-rated physical health was included, measured in the same manner as self-rated mental health. The final measure of health status is a measure of physical functioning that comes from 15 questions regarding activities such as walking, climbing stairs, lifting objects, and kneeling (Fonda and Herzog, 2004). The total number of activities for which the respondent reported any limitations was determined.

Methods

Univariate analyses provide the mean and standard deviation for each variable included in the regression models (shown in Table I). Multivariate analyses for the individual preventive service outcomes were conducted using logistic regression models. Logistic regression models were used for these outcomes because the estimates produced by these models describe the odds of the event (here, whether the preventive service was used or not) occurring (Powers and Xie, 1999). Three sets of models are shown for each outcome. First, the effects of the religion variables are shown alone. Next, the demographic and social control variables were added. Finally, the potential mediators were included. In this way, the third condition of mediation (i.e. the reduction in effect size of the independent variable on the outcome when the potential mediating variables are added) can be assessed. As noted earlier, data limitations preclude the longitudinal analysis of religious salience and preventive service use; therefore, cross-sectional models were run separately for this predictor. Finally, individual-level weights provided by HRS were used in all multivariate analyses to account for sample selection probabilities, missing values, and attrition (Heeringa and Connor, 1995).

Additionally, several steps were taken in order to detect possible problems caused by correlations between the religion variables. To begin, religious attendance and denomination were first added to the regression models separately and then simultaneously. No substantial changes in either the magnitude or significance of the effects were seen, thus, the models displayed later show only the models with both religion variables. Furthermore, interaction effects were tested between religious attendance and

Table I. Sample Characteristics from the Health and Retirement Survey, 1992–1996[a,b]

	Mean	SD
Religion		
Service attendance		
More than 1/week	0.17[c]	0.38
Once/week	0.26	0.44
2–3 Times/month	0.16	0.37
1–2 Times/year or more	0.20	0.40
Never	0.21	0.40
Affiliation		
Catholic	0.27	0.46
Jewish	0.01	0.12
Mainline Protestant	0.30	0.46
Evangelical Protestant	0.35	0.48
Other	0.03	0.17
Not affiliated	0.03	0.17
Religious salience		
Very important	0.74	0.44
Somewhat important	0.21	0.41
Not important	0.06	0.23
Preventive service use		
Mammogram	0.71	0.45
Pap smear	0.68	0.47
Breast exam	0.63	0.48
Demographic and social factors		
Age (51–61 years)	55.66	3.08
Race/ethnicity		
NH White	0.72	0.45
NH Black	0.18	0.39
Hispanic	0.09	0.29
Foreign-born status	0.09	0.29
Resources		
Education (0–17, in years)	11.96	3.01
Household income (0–59.9, in 10,000's)	4.94	5.98
Health insurance	0.77	0.42
Social support		
Married/living with partner	0.69	0.46
Satisfied with friends and family (0–10)	9.11	1.29
Mental health		
Self-rated emotional health (1—5)	3.41	1.08
Depression (0–33)	5.40	5.01
Physical health		
Self-rated physical health (1–5)	2.59	1.20
Chronic conditions (0–7)	1.23	1.14
Activity limitations (0–15)	3.85	2.91

[a]Unweighted, $N = 4253$

[b]Proportions may not add to 1 due to rounding

[c]For categorical variables, proportions are displayed in place of means

denomination for each of the outcomes (analyses not shown). No significant interactions were found, indicating that the effect of religious attendance on preventive service use does not differ by denomination. Interactions between religious salience and the other religion variables were not tested due to the measurement of religious salience at a different point in time. Interactions were also tested between attendance, denomination and age, race, and ethnicity. Again, no significant patterns were seen, indicating that religion influences preventive service utilization in a similar manner for individuals in all of the demographic groups tested in this study.

RESULTS

Mammogram Utilization

Table II displays the odds ratios for the associations between the two religion variables measured at Wave 1 (1992) and mammogram utilization in Wave 3 (1996). The first set of estimates in Model 1 shows that all levels of religious attendance strongly predict the use of mammograms in comparison to women who never attend religious services. The second set of estimates in this model indicates that religious denomination is related to mammogram use. Specifically, Mainline Protestant and Jewish women are both more likely to report utilization compared to Evangelical Protestants ($OR = 1.62$, $p < 0.001$, $OR = 2.63$, $p < 0.01$, respectively). When the sociodemographic and resource variables are added in Model 2, the size and significance of many estimates are reduced. For example, Jewish women (compared to Evangelical Protestants) are no longer more likely to report mammograms. However, even after the social support and health variables are added in the full model (Model 3), the size and significance of the attendance effects remain substantial. In fact, the estimated net effects range from a 35% increase (for those attending one to two times a year or more) in odds to almost double the likelihood of reporting a mammogram (for those attending religious services once a week), compared to those who never attend religious services. It is interesting to note that the odds ratio appears larger for those who attend once per week than for those who attend more than once per week. The affiliation variables show that Mainline Protestants are still more likely than Evangelical Protestants to report having a mammogram ($OR = 1.35$, $p < 0.01$).

Demographic factors that are related to the use of mammograms include race and nativity. Individuals who are non-Hispanic Black and foreign born are more likely to use this type of preventive service. In addition, certain social characteristics also predict use. These include education, income, health insurance, and marital status. Individuals who have

Table II. Estimated Net Effects of Religious Attendance and Affiliation, and Other Controls on the Use of Mammograms (HRS, 1992–1996)[a,b]

	Mammograms		
	Model 1	Model 2	Model 3
Religion			
Service attendance (never)			
More than 1/week	1.89***	1.64***	1.68***
Once/week	2.11***	1.86***	1.91***
2–3 Times/month	1.79***	1.62***	1.65***
1–2 Times/year or more	1.46***	1.33**	1.35**
Affiliation (Evangelical Protestant)			
Catholic	0.99	0.89	0.93
Jewish	2.63**	1.64	1.70
Mainline Protestant	1.62***	1.33**	1.35**
Other	0.98	0.89	0.91
Not affiliated	1.26	1.03	1.06
Demographic and social factors			
Age		0.98	0.98
Race/ethnicity (NH White)			
NH Black		1.34*	1.41**
Hispanic		1.01	1.06
Foreign born status		1.46*	1.53**
Resources			
Education (in years)		1.07***	1.10***
Household income (in 1000's)		1.01***	1.03***
Health insurance		1.66***	1.79***
Social support			
Married/living with partner			1.49***
Satisfied with friends and family			0.98
Mental health			
Self-rated health			0.96
Depression			1.00
Physical health			
Self-rated health			0.99
Chronic conditions			1.12**
Activity limitations			1.00
−2 log likelihood	4833.2	4664.0	4638.0
N	4253		

[a]Logistic regression odds ratios
[b]Weighted data
*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$ (two-tailed test)

more socioeconomic resources and those who are married have a higher probability of using mammograms. Finally, of the potential mediating variables, only the presence of chronic conditions predicts utilization (OR = 1.12, $p < 0.01$). However, the main effects are not reduced when the potential mediators are added (between Models 2 and 3). Thus, there is no support for their mediating role in this model.

Pap Smear Utilization

Pap smears are also associated with religious attendance and denomination, as seen in Table III. Model 1 indicates that, compared to women who do not attend religious services, those who attend two to three times a month or more are significantly more likely to report this type of preventive service. As with mammograms, Jewish and Mainline Protestant women are also more likely to use Pap smears, as are the nonaffiliated, compared to Evangelical Protestants. This effect is especially pronounced for Jewish women, who are 4.09 times more likely to report this preventive service compared to Evangelical Protestant women. Model 2 shows that the effects of attendance and affiliation are attenuated by the addition of the sociodemographic and resource variables, but all (with the exception of the

Table III. Estimated Net Effects of Religious Attendance and Affiliation, and Other Controls on the Use of Pap Smears (HRS, 1992–1996)[a,b]

	Pap smears		
	Model 1	Model 2	Model 3
Religion			
Service attendance (never)			
More than 1/week	1.46***	1.32*	1.33*
Once/week	1.50***	1.37**	1.38**
2–3 Times/month	1.66***	1.53***	1.52***
1–2 Times/year or more	1.20	1.10	1.10
Affiliation (Evangelical Protestant)			
Catholic	1.02	0.91	0.92
Jewish	4.09***	2.81**	2.83**
Mainline Protestant	1.40***	1.20*	1.21*
Other	1.17	1.06	1.09
Not affiliated	1.60*	1.35	1.36
Demographic and social factors			
Age		0.93***	0.93***
Race/ethnicity (NH White)			
NH Black		1.21	1.28*
Hispanic		1.08	1.14
Foreign born status		1.57**	1.62**
Resources			
Education (in years)		1.05***	1.06***
Household income (in 1000's)		1.01***	1.03***
Health insurance		1.63***	1.66***
Social support			
Married/living with partner			1.30*
Satisfied with friends and family			0.98
Mental health			
Self-rated health			0.91*
Depression			0.99
Physical health			
Self-rated health			0.91*
Chronic conditions			1.11**
Activity limitations			0.99
−2 log likelihood	5148.8	4966.6	4947.6
N	4253		

[a]Logistic regression odds ratios
[b]Weighted data
*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$ (two-tailed test)

nonaffiliated) remain significant. Finally, the effects of religion remain stable with the addition of the mediators in Models 3.

Demographic and social predictors of Pap smear utilization are similar to those for mammograms. Younger women, and those who are Black and foreign born are more likely to report utilization of this preventive service. Socially, those who are more educated, have higher incomes, and health insurance are also more likely to use Pap smears. Of the potential mediators, being married is associated with greater preventive service utilization. Individuals with better subjective mental and physical health status are also more likely to use Pap smears, as are those with more chronic conditions.

Self Breast Exams

Religion appears to affect the use of self breast exams differently than the other two preventive service outcomes. Model 1 of Table IV shows that only the lower two categories of religious attendance are related to the use of breast exams. Specifically, attending one to two times a year or two to three times a month are associated with a greater likelihood of

Table IV. Estimated Net Effects of Religious Attendance and Affiliation, and Other Controls on the Use of Self Breast Exams (HRS, 1992–1996)[a,b]

	Self breast exams		
	Model 1	Model 2	Model 3
Religion			
Service attendance (never)			
More than 1/week	0.97	0.96	0.91
Once/week	1.15	1.12	1.09
2–3 Times/month	1.53***	1.51***	1.50***
1–2 Times/year or more	1.23*	1.24*	1.25*
Affiliation (Evangelical Protestant)			
Catholic	0.79**	0.91	0.92
Jewish	0.63	0.71	0.74
Mainline Protestant	0.84*	0.92	0.91
Other	0.70	0.74	0.77
Not affiliated	1.03	1.12	1.17
Demographic and social factors			
Age		1.00	1.00
Race/ethnicity (NH White)			
NH Black		1.61***	1.73***
Hispanic		0.74	0.73
Foreign born status		0.89	0.90
Resources			
Education (in years)		0.97*	0.98
Household income (in 1000's)		1.00	1.01
Health insurance		1.08	1.00
Social support			
Married/living with partner			1.28**
Satisfied with friends and family			1.10***
Mental health			
Self-rated health			1.04
Depression			0.98*
Physical health			
Self-rated health			1.10*
Chronic conditions			1.05
Activity limitations			0.99
−2 log likelihood	5498.1	5470.7	5411.6
N	4253		

[a]Logistic regression odds ratios
[b]Weighted data
*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$ (two-tailed test)

reporting breast exams compared to those who never attend (OR = 1.23, $p < 0.05$; OR = 1.53, $p < 0.001$, respectively). Furthermore, none of the religious affiliation variables predict the use of self breast exams in the same direction as they do for the other preventive services. For example, Mainline Protestant women, as well as Catholics, are both associated with lower levels of self breast exams than Evangelical Protestant women. However, the addition of the demographic and social controls in Model 2 removes the denomination effects. As with the previous outcomes, the addition of the control variables and potential mediators does not alter the effects of religious attendance on the use of self breast exams.

The demographic and social predictors of self breast exams also differ from the previous models. For instance, age, nativity, and socioeconomic status measures are not predictors of self breast exams. Variables that are significantly associated with the use of self breast exams include race, ethnicity, marital status, satisfaction with friends and family, depressive symptoms, and self-rated physical health. Blacks are more likely to report this health behavior, while Hispanics are less likely to do so, compared to Whites. Of the potential mediators, married women

are more likely to report usage, as are those who are more satisfied with their relationships. Also, women who have fewer depressive symptoms and those who are in poorer health are more likely to report self breast exams.

Religious Salience

As discussed earlier, separate, cross-sectional models were run to estimate the association between religious salience and the use of female preventive services. The models for the relationship between religious salience and mammograms and Pap smears (not shown) indicated that religious salience is not significantly associated with these preventive services. However, religious salience was significantly related to the use of self breast exams and these results are shown in Table V. The first model indicates that women who report that religion is somewhat or very important in their lives are more likely to have a self breast exam than women who say that religion is not important ($OR = 1.43$, $p < 0.05$; $OR = 1.49$, $p < 0.01$). This association remains significant after controlling for demographic and socioeconomic variables and possible mediators (Models 2 and 3).

DISCUSSION

Religion appears to be inconsistently associated with adult women's utilization of preventive health services. The association between religion and preventive service use depends on both the aspect of religion measured and the type of preventive service in question. Most notably, there is something about attending religious services that is related to increased rates of female preventive service utilization. In addition, levels of use also vary by religious denomination and religious salience. These relationships

Table V. Estimated Net Effects of Religious Salience and Other Controls on the Use of Self Breast Exams (1992–1996)[a,b]

	Self breast exams		
	Model 1	Model 2	Model 3
Religion salience (not important) [c]			
Very important	1.49**	1.38*	1.32*
Somewhat important	1.43*	1.39*	1.38*
Demographic and social factors			
Age		1.00	1.00
Race/ethnicity (NH White)			
NH Black		1.63***	1.74***
Hispanic		0.84	0.73*
Foreign born status		0.89	0.90
Resources			
Education (in years)		0.97	0.98
Household income (in 1000's)		1.00	1.01
Health insurance		1.07	1.00
Social support			
Married/living with partner			1.25**
Satisfied with friends and family			1.09**
Mental health			
Self-rated health			1.03
Depression			0.98*
Physical health			
Self-rated health			1.10*
Chronic conditions			1.05
Activity limitations			0.99
−2 log likelihood	5518.0	5487.2	5431.8
N	4253		

[a]Weighted HRS data
[b]Logistic regression estimates
[c]Reference category in parentheses
*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$ (two-tailed test)

remain significant, even after controlling for such factors as age, race, ethnicity, and socioeconomic status. To further explain these relationships, the mediating role of social support and health status were assessed. However, the results indicate that the associations between religion and preventive service use were not accounted for by these measures.

As noted earlier, religious attendance was found to consistently predict utilization for the preventive services examined here. Generally, individuals who attend religious services are more likely to report the use of female preventive services compared to those who never attend. It is interesting to note, however, that this association between religious attendance and preventive service use does not follow a dose–response pattern. In other words, although not attending any religious services consistently predicts the lowest levels of preventive service utilization, the magnitude of the association between attendance and preventive service use does not linearly increase as the frequency of attendance increases. This produces a pattern of relationships between attendance and preventive service use that may be best described as curvilinear with the largest odds ratios found for moderate levels of attendance. It is possible that individuals or situations consistently related with the highest and lowest (while still attending) attendance categories are different from the other groups in some (unmeasured) ways that also influence their use of preventive services. Unfortunately, any speculations on the reasons behind these trends would be exactly that. The finding of significant curvilinear relationships together with the lack of theoretical support for a nonlinear relationship highlights the need for future research in this area. Qualitative research focusing on the beliefs, values, and activities of the most and least frequent attenders would be particularly valuable.

The current study also found that denominational differences in levels of preventive service use exist; however, the predictive ability of the religious denomination variables was not consistent across the range of preventive service outcomes. The strongest finding was that Mainline Protestants were more likely to report mammograms and Pap smears, compared to Evangelical Protestants. Furthermore, Jewish individuals were almost three times as likely to report utilization of Pap smears compared to Evangelical Protestants. Women in other affiliation categories (Catholic, Other, or no affiliation) did not appear to use these preventive services differently than Evangelical Protestants once demographic and social characteristics were controlled. While no previous studies have examined this wide of range of affiliations, past evidence does support denominational differences in female preventive health care utilization (Benjamins and Brown, 2004; Miller *et al.*, 1980; Miller and Champion, 1993; Murray and McMillan, 1993; Naguib *et al.*, 1968; Yi, 1994, 1998).

It is important to observe that the higher utilization rates of Mainline Protestants and Jews compared to Evangelical Protestants are not explained by the inclusion of the socioeconomic resources or proposed mediators. However, it is still possible that some unmeasured aspects of social or personal resources may be influencing the higher utilization rates of these denominations. If this were true, the adjusted estimates of denominational effects in this study may be overestimated. Despite, or perhaps because of, this lack of understanding regarding the cause of the denominational disparities, these results strongly support the separation of Protestant groups into at least these two categories in future studies.

The final measure of religion, religious salience, is associated with only one of the preventive service outcomes. Specifically, women who report that religion is a very or somewhat important factor in their lives were more likely to report self breast exams than women who report that religion is not important to them. Although this link between religious salience and preventive health care use has been found only once before (Benjamins and Brown, 2004), other studies have shown that religious salience or closely related concepts (such as intrinsic religiosity or religious meaning) are associated in a beneficial manner with a variety of health behaviors, including alcohol use, smoking, marijuana use, sexual activity among teens, and violence (Assanangkornchai *et al.*, 2002; Nonnemaker *et al.*, 2003; Krause, 2003). Notice that, until recently, this connection between religious salience and health behaviors had been virtually ignored. With the growing awareness of the potential importance of this measure of religiosity in health research, more work will need to be done to examine how individual ratings of religious salience or intrinsic religiosity influence health behaviors and outcomes.

Future researchers examining the role of religious salience should be aware of possible measurement issues. Specifically, examination of frequencies of this variable reveal that the majority of respondents reported the highest level of religious salience (see Table I). In other words, the measure appears to have a "ceiling effect" in which additional

categories at the high end of the scale would more precisely describe the beliefs of the respondents. While nothing can be done to resolve this issue in the current data set, care needs to be taken when interpreting the results. It is possible that this lack of variability caused the influence of religious salience to be underestimated, since the variation in levels of religious salience among individuals within the highest category is likely to dampen its impact on preventive service use. If the respondents were allowed to place themselves into more categories, such as extremely, very, moderately, slightly, and none, different results may have been found (e.g. a stronger association between the highest category of religious salience and the outcomes).

These relationships between the different aspects of religion and preventive service use were hypothesized to work through numerous pathways. As mentioned earlier, two sets of possible mediators—social support and health status—were investigated in an effort to "explain" the associations between religion and preventive service use. In the analyses not shown, associations between the independent, dependent, and possible mediating variables were assessed. The findings revealed that only a small number of the social support and health variables were both significantly related to the religion measures and important predictors of preventive health care use. Specifically, only marital status and self-rated physical health fulfilled these initial requirements for being mediators. However, as seen in Tables III–V, the relationships between the religion variables and the preventive service outcomes were not substantially affected by the inclusion of marital status and self-rated health in the models. Thus, the requirements for mediation were not met by any of the proposed variables and it must be concluded that social support and health status do not mediate the relationships between religion and preventive service use in the current study.

Although not tested by the data, other possible explanations can be proposed. For example, attending religious services implies some level of involvement with a particular religious organization and this involvement may provide individuals with exposure to health-related activities and information (Davis *et al.*, 1994; Erwin *et al.*, 1999; Fox *et al.*, 1998; Lasater *et al.*, 1986; Levin, 1984; Voorhees *et al.*, 1996), as well as religious and social motivation to maintain one's health. In addition, it is possible that the relationship between attendance and preventive service utilization may be due to issues of selectivity. In other words, some third variable, such as an underlying personality trait or lifestyle characteristic, may influence both behaviors and, thus, may account for the relationship. For example, levels of conscientiousness may differentiate those who regularly attend religious services and use preventive services and those who do not. More conscientious individuals tend to adhere to norms and rules, have greater self-control, and spend more time on planning and organization. For these reasons, they could be expected to attend religious services more frequently and utilize preventive health care regularly. In fact, previous studies have shown that aspects of conscientiousness are related to religious involvement (MacDonald, 2000; McCullough *et al.*, 2003; Worthington *et al.*, 2001), as well as to health behaviors and outcomes (for reviews, see Bogg and Roberts, 2004; Salovey *et al.*, 2000). Although these pathways could not be tested directly with the available data, the lack of dose–response relationships between attendance and health service utilization complements the need for development and testing of specific hypothetical mechanisms linking religion and health.

Finally, it is interesting to note that the association of the religion measures varies according to the type of preventive service. Notably, determinants of self breast exams differ from predictors of mammograms and Pap smears. There are several possible explanations for these differences. Mammograms and Pap smears may both be performed during a woman's visit to a physician (e.g. during annual check-ups), but a self breast exam is a private activity that must be periodically conducted by the women themselves, at home. Although visiting a physician requires some degree of motivation, performing self-exams may require more effort to both remember and carry out without any external encouragement. With this in mind, the different relationship that this outcome had with the religion variables may be easier to understand. For example, attending religious services and being affiliated with a specific denomination do not have a strong influence on self breast exams. This may be because religious organizations can not provide this type of screening, nor can many of the other institutional means of encouraging utilization (such as providing transportation) facilitate use. In contrast, the private nature of both self breast exams and religious salience may help to explain the connection between these two measures. For example, it is possible that a sense of responsibility to a higher being may account for the higher likelihood of more religious women (i.e. those with higher levels

of religious salience) to complete self breast exams.

One last set of findings merits a brief discussion. Specifically, the finding that non-Hispanic Blacks were significantly more likely than Whites to report utilization of all three types of preventive services may be surprising to many researchers and clinicians. However, previous studies have also provided evidence of higher levels of breast and cervical cancer screening among Blacks. For example, before 1998 (and during the time of this study), several studies found that mammography utilization rates were higher for Blacks than for Whites (NCHS, 2004; NCI Consortium, 1995). Similarly, other national-level data support the finding that Blacks use Pap smears significantly more than Whites (Breen *et al.*, 2001; Hewitt *et al.*, 2002; NCHS, 2004). However, these unexpected racial differences are the subject of some controversy. For example, questions regarding the validity of self-reported utilization data have been raised (Fiscella *et al.*, 2004). Perhaps for this reason, racial disparities in breast cancer screening are not always found (Breen and Kessler, 1994; Breen *et al.*, 2001; Fiscella *et al.*, 2004).

As with any study, certain limitations of the data must be acknowledged. To begin, any conclusions inferred from this study must be taken cautiously because the data set is only representative of U.S. women between the ages of 51 and 61. Second, there are many measurement limitations. While they are the best measures available in the data used here, more precise measures would improve the estimates of the related associations. In addition, one of the primary predictor variables, religious salience, was measured concurrently with the outcomes in Wave 3 of the HRS. Although conclusive information regarding the temporal ordering of these constructs can only come from longitudinal data, previous studies have found that religiosity, including measures of religious salience, is relatively stable during adulthood (Courtenay *et al.*, 1992; Markides *et al.*, 1987). Finally, several of the denominational categories have relatively small numbers of individuals. Most notably, there are only 62 Jewish respondents in the sample. For this reason, findings involving this denomination should be considered exploratory.

Future studies of religion and preventive service utilization would do well to address these limitations. For example, this relationship should be examined within a sample of all women for whom these services are appropriate. Moreover, while the religion measures in this study improve on those used in previous studies, more aspects of religion (such as private religious activities) need to be considered. More specific denominational information may also be useful, especially within the Protestant and "Other" categories. Finally, more information on beliefs stemming from theology, church teachings, or norms that may affect health knowledge and behaviors would be beneficial.

CONCLUSION

Religion has been a particularly neglected social factor in health research and findings such as those shown here may compel health care workers and health researchers to pay more attention to religious involvement as a potentially significant correlate of health care utilization. While the use of general health care services is mainly determined by an individual's need for such services, utilization levels for preventive health care are more susceptible to other factors. This essential difference, along with empirical evidence from studies such as this, challenge researchers and practitioners in the health care field to further consider how religion may affect the utilization of preventive services. These results also add to the growing field of religion and health research. Preventive health care use is emerging as a possible mechanism linking religious involvement and beliefs to a wide variety of health outcomes. Although still untested, the inclusion of preventive service utilization in studies investigating the influence of religion on various aspects of morbidity and mortality will be the next step in investigating the role of this potentially illuminating piece of the puzzle.

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