

Does Religion Increase the Prevalence and Incidence of Obesity in Adulthood?

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Previous research reveals that religion in America is related to variations in body weight. This article examines the relationships between religion and both body mass index (BMI) and obesity, which have increased in prevalence in the United States over the past two decades. Using longitudinal data from a national sample of adults, this study prospectively examines whether dimensions of religious life are associated with weight gain and the development of obesity during eight years of follow-up. We examine four dimensions of religiosity (attendance, salience, media practice, and consolation) and religious affiliation. Ordinary least squares regression analyses reveal that high levels of religious media practice are associated with higher BMI in women. Logistic regression analyses reveal that high levels of religious media practice and affiliation with a Baptist denomination increased the risk of obesity for women, but that a high level of religious consolation reduced the risk of obesity incidence for men. Attendance at religious services was associated with a lower risk of the incidence of obesity for women, suggesting the importance of studying links between dimensions of religious life and body weight.

INTRODUCTION

Numerous studies show that religious commitment, especially when supported by a religious community, is an important determinant of lifestyle and moral actions. For religiously committed people, many of their faith's teachings offer moral and practical guidance regarding how to attain, maintain, or recover physical and emotional health (Levin 2001). In some cases, this involves avoiding deviance—in moral terms, not committing the seven deadly sins (Lyman 1978). As a result, religion may affect well-being through the promotion of a personal lifestyle that is beneficial to health (Ellison 1991). Although there is much literature concerning the effects of religion to constrain adherents from deviant acts, one relationship that has received limited attention is the role of religion on body weight and obesity. Gluttony is the object of disdain in many faiths (e.g., Proverbs 23:20–21), and obesity has long been considered a form of deviance or nonconformity (Maddox, Back, and Liederman 1968). Religion's impact on body weight is an important health issue for modern societies, in which the rate of obesity is increasing, but the topic has received relatively little research attention. Moreover, the research that has been done has produced intriguing results, with some studies suggesting that religion increases the risk of obesity.

Obesity, defined as a body mass index (BMI: kg/m^2) ≥ 30 , has become a serious problem in the United States with 30 percent of adults over the age of 20 now identified as obese (Flegal et al. 2002). In addition, another 34 percent of the U.S. population is overweight (BMI ≥ 25 and < 30). These figures demonstrate that individuals considered normal weight, according to the National Heart, Lung, and Blood Institute (NHLBI 1998) guidelines, are now a statistical minority (Critser 2003). To illustrate what is meant by obesity, a person 5'8" tall would need to weigh at least 197 pounds to be classified as obese.

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Obesity is due to many factors including genetic, physiologic, metabolic, behavioral, psychological, and social influences (Flegal et al. 2002). Obese individuals are at increased risk of many illnesses and impaired mobility as well as increased risk of death for many causes (Zagorsky 2004). Individuals who are obese can also experience social stigma and discrimination (NHLBI 1998). The numerous negative consequences of obesity have spurred interest in understanding its correlates.

Religion and Health

A few decades ago, the idea that religion may play a salient role in health was viewed with skepticism by many. The religion/health relationship, however, has gained broader acceptance due to the growing number of rigorous social and epidemiologic investigations. Ellison and Levin's (1998) review of these studies shows that most find a positive relationship between religion and health. For instance, people who regularly attend church, pray, or read the Bible tend to have lower blood pressure than less religious people. People who are religious are hospitalized less often and are less likely to suffer from depression. They are also more likely to have healthier lifestyles, a stronger sense of well-being and life satisfaction, stronger immune systems, and longevity (Koenig 1999). Levin's (2001) analysis of people who regularly attend church also found that they have lower rates of illness (e.g., heart disease, cancer, and hypertension) and death.

Although a large and growing body of research examines religion and health, relatively few studies have systematically examined religion and body weight. Given religion's positive effect on health, one might suspect that religion is associated with less obesity. Most religions condemn overeating and gluttony, but little research supports such a conclusion about adherents' actual behavior. Indeed, several studies show that some religious groups have higher rates of overweight and obesity.

Religion and Obesity

Among studies examining religion and body weight, Lapane et al. (1997) reported that church members participating in the Pawtucket Heart Health Program were more likely than people who were not church members to be greater than 20 percent overweight (with a mean BMI of 0.8 higher). Church members also had higher total cholesterol and blood pressure than people who were not church members.

Using state-level ecological data and a national sample of adults, Ferraro (1998) found that there are more obese individuals in states with a higher proportion of persons claiming religious affiliation, and in states with a higher proportion of Baptists. Using individual-level data, he also found that religious practice was positively associated with BMI, independent of socioeconomic status.

More recently, Kim, Sobal, and Wethington (2003) found that men in conservative Protestant denominations were more likely to have a higher body weight than men in other religious affiliations. This relationship did not hold, however, for women. The authors also found that other dimensions of religiosity—such as religious attendance, social support, commitment, and identity—were related to higher BMI, but that these relationships were attenuated or disappeared altogether after controlling for smoking. Kim, Sobal, and Wethington (2003), therefore, argued that much of the relationship between religion and obesity is actually a consequence of lower smoking rates among religious persons.

There is some consistency across these studies that religion is related to higher body weight, but there may be many different explanations for this relationship. First, many religions in the United States place priority on constraining sins such as smoking, excessive alcohol consumption, and sexual promiscuity. Gluttony does not receive the same level of pastoral or congregational

condemnation in most denominations, perhaps indirectly creating an “accepted vice.” It is even possible that religion’s success in curtailing smoking may inadvertently lead to a higher rate of obesity (Kim, Sobal, and Wethington 2003). Some people use smoking as an appetite suppressant, and religion decreases the likelihood of smoking.

Second, many religious functions use food, rather than alcohol, as the celebratory good to be consumed (Sack 2001). From Sunday School donuts to church pot-luck dinners, food, especially high-fat foods, are key to the social organization of many U.S. religions.

Third, it may be that religion does not lead to overweight and obesity, but that the opposite causal process exists—a form of social selection (Kim, Sobal, and Wethington 2003). Perhaps religious organizations provide a “religious haven”—a consoling and welcoming setting for people who are obese and seeking protection from social stigma.

Finally, religion is not always practiced at a place of worship such as a church or synagogue. Some people practice religion from their own homes using religious television or radio programs or reading religious books or magazines. We refer to this consumption of religious materials as “religious media practice.” It may or may not be private or solitary practice; participants may be joined by others who are interested in these expressions of the electronic church or print media. Unlike most religious services, however, people who practice religion in this way have access to food and beverages while they are watching or listening to religious programs or reading religious magazines. This could also contribute to higher rates of obesity.

There may be many other mechanisms at work, but the research to date is limited in three important ways when one attempts to identify which processes may link religion and obesity. First, we are unaware of any longitudinal studies of religion and body weight. With cross-sectional data it is very difficult to establish temporal order, and thus it is impossible to establish causal order. Religion may have an effect on body weight, but body weight may also influence religion. At best, the previous studies can show an association or a correlation between religion and body weight. Given this problem with cross-sectional data, prospective longitudinal studies are needed to examine the relationship and potentially establish causality.

A second limitation of previous research is the degree to which it examines different dimensions of religious life. Some studies are limited to measures of church membership, affiliation, or attendance (e.g., Lapane et al. 1997). Both Ferraro (1998) and Kim, Sobal, and Wethington (2003) examined multiple dimensions of religion, albeit with cross-sectional data. We propose in the present research to examine multiple dimensions of religion, from affiliation to identity, in a longitudinal design, to determine if religion increases the likelihood of becoming obese. If one can prospectively observe higher incidence of obesity over time among religious people, this would demonstrate that religion is antecedent to obesity. With cross-sectional data, one is unable to distinguish this effect from the mechanism whereby obese people seek religious consolation.

Finally, previous research has documented considerable variability across religious affiliations in how body weight is treated and in the actual prevalence of overweight and obesity. For instance, Mormons and Seventh Day Adventists stress health protective behaviors and have lower rates of obesity (Kim, Sobal, and Wethington 2003). Other denominations give less attention to body weight issues and may be more likely to be at risk of member obesity. Thus, research on religion and obesity needs to be sensitive to the variation across religious denominations.

Given the research to date, this article explores two major questions: (1) Is religion related to the *prevalence* of obesity? (2) Is religion related to the *incidence* of obesity? We examine the first question with cross-sectional analyses to determine if there is a relationship between point estimates of the two phenomena. The second question relies on longitudinal analyses to determine if religion heightens the risk of becoming obese. Answers to these questions will help identify whether religion is a risk or protective factor in understanding the growing incidence of obesity in the United States.

METHOD

Data

This study used three waves of data from the Americans' Changing Lives (ACL) survey, a national survey that included 3,617 adults at baseline (House 2003). A multistage, stratified area-probability sample was used in 1986, including an oversample of African Americans and those 60 years of age and older (for a complete account of the population of interest and how respondents were selected, see House 2003). For Wave 2 (1989), an attempt was made to contact all Wave 1 respondents, but 166 died and 584 were not interviewed because of refusals, inability to trace, or physical limitations. For Wave 3 (1994), an attempt was made to contact all the respondents from Waves 1 and 2 who were known not to be deceased. Wave 3 included 2,562 people, 750 of whom responded at Wave 1 but not at Wave 2.

Measures

Obesity

The measurement of obesity is based on the Quetelet Index, also known as body mass index (BMI). BMI is weight divided by height squared (kg/m^2). Weight and height are based on self-reported measures in face-to-face interviews (reported in U.S. standard units, but converted to metric). The widely accepted definition of obesity is a BMI of ≥ 30 . We use a binary variable for obesity (1 = obese; 0 = not obese).

Religious Affiliation

We created dummy variables for the following groupings of religious affiliations (1 = the denomination of consideration; 0 = otherwise): fundamentalist Protestant (includes Church of Christ, Pentecostal/Assembly of God, and Church of God), pietistic Protestant (includes Methodist, Christian Church, and African Methodist Episcopal), nondenominational Protestant, Reformation-era Protestant (includes Episcopalian, Lutheran, Presbyterian, and Congregationalist), Baptist (includes Southern Baptist, North American Baptist, and Fundamentalist Baptist), nontraditionalist (includes Jehovah's Witnesses, Mormon, Seventh Day Adventists, and Christian Scientist), Catholic, Jewish, other non-Christian (includes Muslim, Hindu, and Buddhist), and none (no religious affiliation). Each denomination was tested in preliminary analyses, but only those denominations manifesting a significant bivariate relationship with either prevalent or incident obesity or severe obesity were retained for the final analysis.

Religious Attendance

Religious attendance was assessed by the question, "How often do you usually attend religious services?" Responses to this question ranged from never (1) to more than once a week (6).

Religious Salience

Religious salience or identity was assessed by the question: "In general, how important are religious or spiritual beliefs in your day to day life?" Responses ranged from not at all important (1) to very important (4).

Religious Media Practice

One of the advantages of the ACL for the present study is the measurement of religious media practice based on two indicators. Both questions asked the respondent to report the frequency of engaging in the selected activity by using six categories ranging from never (1) to more than once a week (6). The two items examined “reading religious books” and “watching or listening to religious programs on the television or radio.” Although many studies rely on attendance at religious services, which requires some degree of mobility, or help with mobility, religious media practice is not so constrained. This index of two items had an alpha coefficient of reliability of 0.65.

Consolation

Consolation refers to seeking spiritual or religious support and was assessed by the question: “When you have problems or difficulties in your work, family, or personal life, how often do you seek spiritual comfort and support?” Responses ranged from never (1) to almost always (5). We use this measure primarily as an independent variable. Supplementary analyses, however, considered consolation as the dependent variable—in order to determine if obesity increases religious consolation.

Covariates

There are a number of variables that should be considered when examining the link between religion and obesity. A critical control variable is smoking, measured here by self-report of cigarettes, cigars, or pipes (scored 1 if a current smoker; 0, otherwise). Age is coded in years. Race, sex, marital status, and residence in the South are all binary variables (0, 1), with 1 equal to black, female, married, and living in the South.

Obesity is more prevalent among persons of lower socioeconomic status, so two control variables were tested. The income variable refers to annual family income in 1986. This variable ranges from less than \$5,000 per year (coded 1) to \$80,000 or more per year (coded 10). Education is highest level of education achieved and ranges from zero to eight years (coded 1) to 17 years or more (coded 6).

Physical activity was measured with one item and refers to any kind of physical activity (e.g., walking, swimming, jogging, etc.) in which a respondent typically engaged during one week. Responses range from never (0) to often (3).

Table 1 displays means and standard deviations of the variables. W1 refers to Wave 1 variables and W3 refers to Wave 3 variables. Additional covariates considered and tested, but deleted from the final analyses, include past smoker, functional limitations, and number of children in the household.

Analytic Plan

Analyses were conducted using subsamples of men and women. The analysis plan was designed in three stages. In the first stage, we examined the relationship between religion and BMI at Wave 1 and the relationship between religion and BMI between Waves 1 and 3. In the second stage, we examined the prevalence of obesity at Wave 1. Prevalence refers to the total number of cases with the condition at the first interview. Finally, we analyzed the incidence of obesity between Waves 1 and 3. Incidence refers to all cases who were not obese at the baseline but became so by either Wave 2 or Wave 3. The logic of the analyses examining incidence between Waves 1 and 3 is to take advantage of the longitudinal data in order to study the temporal order between religion and obesity.

TABLE 1
DESCRIPTIVE STATISTICS FOR VARIABLES:
AMERICANS' CHANGING LIVES, 1986–1994

	Range	Total (<i>n</i> = 3,617)	Men (<i>n</i> = 1,358)	Women (<i>n</i> = 2,259)
<i>Religiosity</i>				
Attendance, W1 (6 = more than once per week)	0–6	3.52 ^a (1.79) ^b	3.19 (1.77)	3.71 (1.78)
Salience, W1 (4 = very important)	1–4	3.45 (0.81)	3.23 (0.92)	3.58 (0.70)
Media Practice, W1 (2 items; alpha = 0.65)	2–12	7.16 (3.32)	6.40 (3.25)	7.61 (3.28)
Consolation, W1 (5 = almost always)	1–5	3.49 (1.44)	3.05 (1.47)	3.76 (1.36)
<i>Religious affiliation</i>				
Baptist	0–1	0.30	0.28	0.32
Fundamentalist Protestant	0–1	0.08	0.08	0.07
<i>Obesity</i>				
Obese, W1	0–1	0.18	0.14	0.20
Obese, W3	0–1	0.23	0.21	0.24
BMI, W1	11.49–55.07	25.00 (5.09)	25.97 (4.24)	26.01 (5.54)
BMI, W3	14.17–54.68	26.70 (5.36)	26.92 (4.57)	26.57 (5.76)
<i>Status characteristics</i>				
Income (10 = \$80,000 or more)	1–10	4.35 (2.61)	5.00 (2.59)	3.96 (2.54)
Education (6 = 17 years or more)	1–6	2.97 (1.44)	3.11 (1.54)	2.88 (1.37)
Black	0–1	0.33	0.29	0.34
Married, W1	0–1	0.55	0.65	0.48
Age (in years)	24–96	53.65 (17.63)	51.35 (17.44)	55.02 (17.59)
Current smoker	0–1	0.29	0.34	0.27
Physical activity (3 = often)	0–3	1.46 (1.24)	1.69 (1.24)	1.33 (1.24)
South	0–1	0.40	0.38	0.40

^aMean.

^bStandard deviation.

To account for the complex sampling design, sample weights were applied and standard errors were adjusted using the Huber-White-Sandwich method in Stata 8.0.

FINDINGS

Given the many religious affiliations, we begin the analysis by presenting in Table 2 the percent of obese individuals for each religious affiliation. As shown in the table, Baptists have the highest percentage of obese persons in the sample, and this is consistent at both survey waves. Fundamentalist Protestants have the second highest percentage of obese individuals in the sample—also consistent at Wave 1 and Wave 3. Catholics also have a fairly high percentage of obese people, as do pietistic Protestants. Other non-Christians have the lowest percentage of obese

TABLE 2
PERCENT OBESE AT WAVE 1 AND WAVE 3 BY RELIGIOUS
AFFILIATION: AMERICANS' CHANGING LIVES, 1986–1994

	Number of Cases, W1	Obesity	
		W1	W3
Baptist ^a	1,098	24%	30%
Fundamentalist Protestant ^b	250	18	22
Pietistic Protestant ^c	509	13	19
Nondenominational Protestant	166	5	5
Reformation-Era Protestant	453	9	9
Catholic	720	17	17
Nontraditionalist ^d	92	2	3
Jewish	59	1	1
Other non-Christian ^e	18	0.2	0.7
None	237	6	7
Total	3,602		

^aIncludes Southern Baptist, North American Baptist, Fundamentalist Baptist.

^bIncludes Church of Christ, Pentecostal/Assembly of God, Church of God.

^cIncludes Methodist, Christian Church, African Methodist Episcopal.

^dIncludes Jehovah's Witnesses, Mormon, Seventh Day Adventists, and Christian Scientist.

^eIncludes Muslim, Hindu, and Buddhist.

individuals at both waves of data, followed by Jews. The remaining affiliations have percentages ranging from 2 to 9, and persons with no religious affiliation are within this range. Although all the affiliations in Table 2 were originally included in the logistic regression models, most were deleted because they were not significant in multivariate analyses. The two that were carried through to the final results were Baptist and fundamentalist Protestants.

Table 3 displays the results of ordinary least squares (OLS) regression of BMI by sex. Models 1 and 2 provide coefficients for BMI at Wave 1, with Model 1 including only religion variables, and Model 2 including all covariates. Males who report higher religious attendance tend to have significantly higher BMIs, but this relationship attenuates when covariates are added into the model. Females who actively engage in religious media practice tend to have higher BMIs. Female Baptists tend to have higher BMIs as well, but this relationship attenuates when covariates are added into the model. Women who report higher levels of religious consolation tend to have lower BMIs, but this relationship also attenuated when covariates were added into the model.

Models 3 and 4 show results for change in BMI between Wave 1 and Wave 3, with Model 3 including only religion variables and BMI at Wave 1, and Model 4 including all covariates. Few variables are significant in predicting change, in part because the association between BMI at Waves 1 and 3 is strong. Age is a significant predictor of change in BMI, with older persons experiencing a decline in BMI. For men, physical activity was a significant predictor of BMI at Wave 3. Men who were more physically active were more likely to experience a gain in BMI over the study.

Table 4 displays the results of the logistic regression analyses of obesity (BMI \geq 30) by sex. Models 1 and 2 provide odds ratios for the *prevalence* of obesity, with Model 1 including only religion variables and Model 2 including all covariates. Females who report higher religious attendance are less likely to be obese, but this relationship dissipates when covariates are added

TABLE 3
REGRESSION OF BMI BY SEX, WAVES 1, AND 3: AMERICANS' CHANGING LIVES, 1986-1994

Independent Variables	Wave 1				Wave 1 to Wave 3			
	Model 1		Model 2		Model 3		Model 4	
	Men	Women	Men	Women	Men	Women	Men	Women
<i>Religiosity</i>								
Attendance, W1	0.25* (0.11) ^a	-0.13 (0.09)	0.17 (0.11)	-0.09 (0.09)	-0.15 (0.08)	0.02 (0.07)	-0.13 (0.07)	-0.01 (0.07)
Salience, W1	0.05 (0.20)	0.13 (0.24)	0.02 (0.20)	-0.17 (0.24)	0.02 (0.15)	-0.21 (0.15)	0.14 (0.14)	-0.17 (0.15)
Media practice, W1	0.05 (0.09)	0.31*** (0.05)	0.05 (0.09)	0.20** (0.06)	0.00 (0.04)	0.03 (0.36)	0.03 (0.04)	0.03 (0.04)
Consolation, W1	-0.19 (0.14)	-0.30* (0.12)	-0.14 (0.14)	-0.19 (0.12)	0.03 (0.11)	-0.02 (0.08)	-0.04 (0.10)	-0.01 (0.07)
<i>Religious affiliation</i>								
Baptist	-0.50 (0.43)	1.18** (.34)	-0.72 (0.48)	0.71 (0.39)	0.16 (0.25)	0.17 (0.25)	0.12 (0.24)	0.01 (0.27)
Fundamentalist Protestant	-0.81 (0.52)	-0.08 (0.55)	-0.92 (0.49)	-0.56 (0.53)	0.28 (0.34)	0.50 (0.32)	0.25 (0.31)	0.18 (0.31)
<i>Status resources and characteristics</i>								
BMI, W1			0.96*** (0.03)		0.96*** (0.03)	0.88*** (0.02)	0.98*** (0.03)	0.90*** (0.02)
Income			0.14 (0.08)	-0.12 (0.07)			0.02 (0.05)	0.05 (0.04)
Education			-0.25* (0.12)	-0.44*** (0.11)			0.01 (0.07)	-0.07 (0.08)
Black			0.63 (0.35)	2.02*** (0.36)			0.20 (0.23)	0.38 (0.29)
Married, W1			0.60* (0.28)	0.88* (0.38)			-0.03 (0.26)	-0.25 (0.22)
Age			-0.01 (0.01)	0.02 (0.01)			-0.05*** (0.01)	-0.06*** (0.01)
Current smoker			-1.04** (0.29)	-0.96** (0.33)			-0.04 (0.24)	-0.32 (0.19)
Physical activity			-0.23 (0.13)	-0.42** (0.15)			0.28** (0.09)	0.08 (0.08)
South			0.09 (0.38)	-0.65* (0.31)			-0.09 (0.16)	-0.04 (0.19)
R ²	0.01	0.04	0.05	0.11	0.71	0.71	0.74	0.74
Number of cases	1,339	2,185	1,336	2,183	917	1,592	916	1,590

^aStandard error in parentheses.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

TABLE 4
LOGISTIC REGRESSION OF OBESITY PREVALENCE AND INCIDENCE BY SEX: AMERICANS' CHANGING LIVES, 1986-1994

Independent Variables	Prevalence, W1				Incidence, W1 to W3			
	Model 1		Model 2		Model 3		Model 4	
	Men	Women	Men	Women	Men	Women	Men	Women
<i>Religiosity</i>								
Attendance, W1	0.96 (0.83-1.10)	0.87* (0.78-0.98)	0.94 (0.82-1.09)	0.92 (0.82-1.02)	0.97 (0.85-1.11)	0.86** (0.77-0.96)	0.95 (0.83-1.10)	0.87* (0.77-0.97)
Salience, W1	1.09 (0.80-1.48)	1.03 (0.74-1.43)	1.08 (0.80-1.45)	0.92 (0.67-1.27)	0.99 (0.73-1.34)	1.04 (0.78-1.38)	0.97 (0.72-1.31)	0.94 (0.71-1.25)
Media practice, W1	1.08 (0.97-1.20)	1.12*** (1.05-1.20)	1.08 (0.97-1.21)	1.09** (1.02-1.16)	1.09 (0.99-1.19)	1.14*** (1.06-1.22)	1.08 (0.98-1.19)	1.14** (1.05-1.23)
Consolation, W1	0.88 (0.74-1.05)	0.90 (0.79-1.02)	0.89 (0.74-1.07)	0.93 (0.82-1.06)	0.84* (0.71-0.99)	0.88 (0.77-1.00)	0.83* (0.71-0.99)	0.91 (0.80-1.03)
<i>Religious affiliation</i>								
Baptist	0.86 (0.51-1.47)	1.84*** (1.34-2.52)	0.85 (0.48-1.50)	1.63** (1.13-2.34)	1.08 (0.62-1.85)	1.53** (1.14-2.05)	0.87 (0.49-1.54)	1.36 (0.97-1.92)
Fundamentalist								
Protestant	0.94 (0.49-1.81)	1.23 (0.69-2.21)	0.91 (0.49-1.69)	1.03 (0.55-1.91)	0.90 (0.44-1.84)	0.83 (0.45-1.53)	0.81 (0.41-1.61)	0.63 (0.34-1.18)
<i>Status resources and characteristics</i>								
Income			1.03 (0.92-1.15)	0.91* (0.84-0.99)			0.98 (0.88-1.10)	0.92* (0.85-0.99)
Education			0.96 (0.80-1.16)	0.78** (0.66-0.92)			0.93 (0.77-1.13)	0.85 (0.73-1.00)
Black			1.11 (0.72-1.71)	1.50* (1.00-2.25)			1.71* (1.06-2.77)	1.39 (0.96-2.00)
Married			1.15 (0.75-1.75)	1.45* (1.03-2.05)			1.37 (0.82-2.31)	1.06 (0.72-1.55)
Age			0.99 (0.97-1.00)	0.99 (0.98-1.00)			0.98 (0.97-1.00)	0.97** (0.96-0.99)
Current smoker			0.73 (0.46-1.15)	0.99 (0.68-1.44)			0.64* (0.42-0.96)	0.64 (0.41-1.00)
Physical activity			0.85 (0.70-1.03)	0.84 (0.69-1.03)			0.98 (0.84-1.14)	0.85* (0.73-0.99)
South			0.98 (0.59-1.61)	0.67* (0.49-0.92)			1.27 (0.87-1.86)	0.76 (0.56-1.03)
χ^2	4.17	32.64	11.17	138.82	5.68	33.64	26.89	105.88
df	6	6	14	14	6	6	14	14
Number of cases	1,339	2,185	1,336	2,183	752	1,305	751	1,304

^aOdds ratio.

^bConfidence interval.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

into the model. Women who actively engage in religious media practice are more likely to be obese than those who consume little religious media. Table 4 also shows that Baptist women are significantly more likely to be obese. Model 2 also reveals that women with higher incomes, more education, and those living in the South are less likely to be obese. Black and married women are more likely to be obese.

Models 3 and 4 show the predicted *incidence* of obesity between Wave 1 and Wave 3. Only respondents who were not obese at Wave 1 are included in this analysis. Model 3 includes only religion variables, while Model 4 includes all covariates. Results from Model 3 show that Baptist women are more likely to become obese, but this relationship dissipates when covariates are added into the model. Models 3 and 4 also show that women who report higher religious attendance and men who report higher religious consolation are less likely to become obese, while women who actively engage in religious media practice are more likely to become obese. The fourth model also reveals that women with higher incomes, who are older, and who report higher rates of physical activity are less likely to become obese, while men who currently smoke are also less likely to become obese. On the other hand, black men are more likely to become obese.

Given the importance of physical activity to the prediction of obesity, we did additional analyses by entering blocks of variables and treating physical activity as a separate predictor. The results of those analyses were very similar to those presented above.

Finally, we attempted to determine if obese people became more religious over time. Not all measures of religiosity were available in the follow-up surveys, but we examined change in religious service attendance and religious consolation with a residualized regression analysis (not shown). There was no evidence that obesity was associated with an increase in religiosity over time. The religious haven hypothesis cannot be supported with these data.

DISCUSSION AND CONCLUSIONS

The purpose of this study was to examine the link between religion and obesity. Is there a relationship? Is there evidence that religion could actually be a risk factor for obesity? Although there are some qualifications, the answer to each question is *yes*.

As pertains to religious affiliation, these analyses revealed a significant relationship between being Baptist and obese for women in the United States. The magnitude of the relationship is modest but worthy of continued investigation. Supplementary analyses point to the primacy of education and race as being the key to explaining the association between religion and obesity: African Americans and persons with limited education are more likely to be obese and are also more likely to be affiliated with Baptist or fundamentalist religious groups. The relationship between religion and social stratification is important to consider while interpreting these findings. Indeed, it may be argued that social inequality and racism are the more antecedent causes of the higher incidence of obesity among those most religiously inclined. At the same time, religion represents one of the most available and authoritative institutions to aid adherents in avoiding obesity. There is evidence that some religious communities play this role—Seventh Day Adventists, Mormons—but it is clear that other religions have not made weight management and health promotion, more generally, a priority. The views of religious denominations on physical activity and exercise are also relevant. Some religious groups consider physical activity relatively unimportant to health maintenance because one should focus on spiritual matters. Other religious groups extend the “temple of the Holy Spirit” dictum to physical activity and fitness norms.

With regard to other dimensions of religious life, the most consistent predictor of obesity for women was religious media practice. This variable ranges from 2 to 12, and for each unit increase in religious media practice, the incidence of obesity in this study rose by 14 percent. The magnitude of this effect is more substantial than any of the other religion variables. With the rise of electronic media in the United States, we believe that the ACL’s measure of religious media practice is largely tapping into being “plugged in” to the electronic church. Although religious

radio may be consumed during ambulation or exercise, it is reasonable to assume in light of these findings that most religious media practice is sedentary, perhaps conjuring images of a “couch potato saint.” Such an individual is engaged with religious media, but not necessarily other forms of religious expression. Indeed, our results suggest that time spent with the electronic church is the matter of concern, not religious salience or attendance *per se*. There is also the issue of overall consumption (i.e., nonreligious) of TV and electronic media. Previous studies have shown that higher rates of TV watching of any kind can lead to higher rates of overweight and obesity (Kautiainen et al. 2005; Yancey et al. 2004; Crespo and Arbesman 2003). Although it would be useful to distinguish religious and nonreligious TV viewing, this distinction was not measured in the ACL survey. Thus, measuring the two types of TV viewing would be a logical next step for extending our understanding of religion and obesity.

Whatever the case, the present research demonstrates prospectively that *religious media practice heightens the risk of obesity*. At the same time, women who reported higher rates of church attendance had a lower risk of becoming obese. These religious activities may be related. The more women attend religious services, the lower their risk for becoming obese; however, the more women engage in religious media practice, the higher their risk for being or becoming obese.

One of the most interesting findings from the current study is the difference between men and women. Our study showed that the more women participate in religious media practice, the more like they were to be obese and to become obese. However, the more men used religion as consolation, the less likely they were to become obese. This means that men may be turning to religion, instead of food, as a form of comfort and through this avoiding obesity.

Although our findings are consistent with some of the studies on religion and body weight, they are inconsistent with other studies. For example, Kim, Sobal, and Wethington (2003) showed that conservative Protestant men had higher BMI, but that religious affiliation was not related to BMI in women. The current study also compared men and women, but found that being a Baptist was related to higher BMI in women. This finding is consistent with results reported by Ferraro (1998), although that study used cross-sectional data only. One wonders why Baptist women are at greater risk of incident obesity. A reasonable hypothesis might center on dietary patterns in the South, where Baptist denominations are also prevalent. However, we controlled for residence in the South, and Baptist women were still at higher risk of incident obesity. Although this study does not permit a definitive answer, we believe that the Baptist emphasis upon *abstaining* from certain practices such as alcohol and tobacco does not translate well to the need for *moderation* in food consumption. Indeed, Baptists may find food one of the few available sources of earthly pleasure (Sack 2001). It appears, moreover, that the denomination gives low priority to characterizations of excess dietary consumption as immoral. This is speculation, however, so there may be value in doing research on how affiliates of various religions view overeating as well as obesity *per se*.

Comparing our findings to other research, it is worth noting that Lapane et al. (1997) showed that church members were more likely to be overweight than nonchurch members. Although we did not investigate church membership, *per se*, our findings show that religious service attendance was *negatively* related to obesity for women, but that religious media practice was *positively* related to obesity for women. Membership and attendance are clearly two different matters because many people are members in the United States—a “nation of joiners.” Our findings also suggest the value of further research on electronic religion because of its prevalence in the United States and its role in understanding the relationship between religion and obesity. The fact that higher levels of religious media practice were associated with both higher average BMI and heightened incidence of obesity among women should stimulate epidemiologic research as well as policy discussions among clergy and public health officials alike. Is the effect of religious media practice distinct from sedentary lifestyles? Although the measurement of physical activity in the ACL is limited, we nonetheless controlled for it. Perhaps more detailed measures of physical activity will

show that the effect due to religious media practice is spurious, but such was not the case with the controls for the measure available in the ACL.

Additional longitudinal studies are needed to explicate the religion/obesity link. Using longitudinal data allows one to untangle some of the associations between religion and body weight. We found prospectively that certain forms of religiosity heightened the risk of obesity for women and that certain forms of religiosity lowered the risk of obesity for men.

Several limitations of the present research need to be considered when interpreting our findings. First, the ACL question probing engagement with the electronic church includes both radio and TV. Distinguishing these two would be helpful in future research, as would time spent on the Internet for religious purposes. TV and computer time are typically sedentary activities; radio may or may not be as sedentary. Second, any national sample will, by definition, have modest proportions of the smaller religious affiliations. To assess accurately the influence of some religious groups, oversamples will be needed. The estimates presented here should be considered suggestive.

The present research has established that religion is related both to the prevalence and incidence of obesity. In supplementary analyses, we were unable to find any evidence that obesity heightened religiosity. By contrast, we observed that religious media practice and some denominations, especially more fundamentalist groups, were at a higher risk of obesity. The results also show that those who turned to religion for consolation were at a lower risk of obesity. At a minimum, one can conclude that obesity is becoming more prevalent in the United States and that many religious affiliations are being swept along with this “megatrend.” Some religious activities and affiliations may reduce the risk of obesity, but Baptist and fundamentalist Protestant leaders may want to consider interventions for the “overgrazing of the flock.” There is clearly a role for religious media, whether electronic or print, in the spiritual development of the religiously inclined. Unfortunately, religious media practice is also associated with a higher risk of obesity for women who consume it.

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