

# Religion among Academic Scientists: Distinctions, Disciplines, and Demographics

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*The religiosity of scientists is a persistent topic of interest and debate among both popular and academic commentators. Researchers look to this population as a case study for understanding the intellectual tensions between religion and science and the possible secularizing effects of education. There is little systematic study, however, of religious belief and identity among academic scientists at elite institutions, leaving a lacuna of knowledge in this area. This absence of data exists at a time when the intersection between religion and science is reaching heightened public attention. Especially with increased tensions surrounding teaching evolution in the public schools, understanding what kind of resources scientists have (particularly in terms of their own religious beliefs and practices) to transmit science to a broader religiously-motivated public is crucial. Using data from a recent survey of academic scientists at twenty-one elite U.S. research universities, we compare the religious beliefs and practices of natural and social scientists within seven disciplines as well as academic scientists to the general population. We find that field-specific and interdisciplinary differences are not as significant in predicting religiosity as other research suggests. Instead, demographic factors such as age, marital status, and presence of children in the household are the strongest predictors of religious difference among scientists. In particular, religiosity in the home as a child is the most important predictor of present religiosity among this group of scientists. We discuss the relevance these findings have for understanding issues related to current theory and public debate about the intersection between religion and science. Keywords: religion, science, scientists, disciplines, religion and science.*

From controversy over stem cell research to teaching evolution in public schools, it is clear that the intersection between religion and science is paramount in the public imagination (Johnson 1998; Krugman 2005; Wald 2003). Increased debate about the role of religion in national politics and public policy influencing science make examining the religious beliefs and identities of scientists particularly relevant (Begley 1998; Johnson 1998; Robinson 1998). Academic scientists influence public discourse explicitly through their societal positions as thought leaders and commentators about issues related to science policy and other matters of import when determining the public relationship between religion and science (Beyerlein 2003; Rado 1987; Zuckerman 1977). Academic scientists at elite institutions participate in public discourse in implicit ways through their teaching, training future leaders of other American institutions, such as the media, primary and secondary education, medicine, and government. Scholars and members of the general public argue that academic scientists will generally view scientific

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knowledge as incompatible with religion (Marsden 1994; Wolfe 1997). Without current data we do not know if this is an accurate description of scientists at elite institutions. We do know, however, that the majority of Americans are religiously involved and many view public issues through a religious lens (Gallup and Lindsay 1999; Smith et al. 1998; Wuthnow 1988, 1999).

*If, in light of current controversy, we see increasing dialogue between scientists and the general population as important to the advancement of science, then we need comprehensive information about the religious beliefs and practices of scientists themselves. Before we can fully understand the role scientists have (and will have) more broadly in public discussion about religion and science, we must understand how scientists view religion and spirituality, including their own. Such understanding will establish whether there are common points of religiosity between scientists and members of the general population that could lead to further dialogue and acceptance of science among the broader public. In this article, we provide the first systematic analysis in decades that examines the religious beliefs and practices of elite academics in the sciences. Our analyses not only have implications for the connection between religion and science in the broader public but also for the connection between religion and science in the academy itself.<sup>1</sup>*

Using data we collected as part of the Religion among Academic Scientists study (RAAS), which includes a survey of natural and social scientists, we examine how scientists differ from the general public, from each other, and some of the sources of these differences. We start by showing broad religious differences between academic scientists and the American population, which reveal that academic scientists are much less religious than the general public according to traditional indicators of religiosity. We then turn to difference within the academy. Since most of the scholarly literature on faculty attitudes towards religiosity addresses the field-specific differences between natural and social scientists, we ask how these two groups compare to one another according to traditional measures of religiosity and find that only a small amount of variance is explained by broad field-specific differences between natural and social scientists or even specific interdisciplinary differences. Instead, particular demographic factors, such as age, marital status, and presence of children in the household, seem to explain some of the religious differences among academic scientists (although our data do not allow direct analysis of causal direction). Most important, respondents who were raised in religious homes, especially those raised in homes where religion was important are most likely to be religious at present. In the discussion and conclusion we examine the relevance of these findings for understanding religiosity among academic scientists at elite research universities, scientists in other kinds of academic institutions, and the contribution these findings have to broader societal debates about religion and science.

### **Differences between Scientists and the General Population**

Comparing scientists at elite institutions to the general population, the psychologist James Leuba did surveys in 1916 and 1934 on the attitudes of American scientists towards Christian belief, which he defined as participation in Christian worship and a Christian theology of life after death. Leuba discovered that scientists were less likely than the general population to believe in God (see Leuba 1916, 1934).<sup>2</sup> In particular, the most successful scientists

1. We thank an anonymous reviewer for useful comments on the article's introduction.

2. Some of Leuba's studies also sampled elite scientists, most of whom were from university populations. In our comparison of the RAAS data with the Carnegie Commission National Survey of Higher Education: Faculty Study (Trow and Associates 1969), we compared only the results from faculty surveyed at the same kinds of elite institutions as the faculty from the RAAS study. We found that 49.2 percent of faculty who responded to the 1969 Carnegie survey attended religious services once a year or less. In the RAAS sample, 49.4 percent had not attended in the previous year. Thirty-five percent of those who answered the Carnegie survey had "no religion" compared to 52 percent of those who responded to the RAAS survey. Twenty-seven percent of the Carnegie faculty claimed to be religiously conservative. Similarly, only 9.1 percent of Catholic scientists in the RAAS sample identified as "traditional" and only 10 percent of the Protestant scientists claimed to be "fundamentalist" or "evangelical."

were the least likely to be religiously involved. An implication of Leuba's findings was that religion ought to completely capitulate to science in order to remain an influence on American society, a sentiment that very much reflects the twentieth century modernist project (Smith 2003). According to Leuba (1934):

In order to be again a vitalizing and controlling power in society, the religions will have to organize themselves about ultimate conceptions that are not in contradiction with the insight of the time. They will have to replace their specific method of seeking the welfare of humanity to appeal to, and reliance upon divine Beings, by methods free from a discredited supernaturalism (p. 300).

Although many scholars have argued about whether religions authority over adherents' actions is experiencing an overall decline in American society (Chaves 1994; Finke and Scheitle 2005; Wuthnow 1988), the number of Americans who consider religion important cannot be denied. About 90 percent of Americans believe in God and 40 percent say that they attend a congregation (place of worship) weekly (Gallup and Lindsay 1999; Hadaway, Marler, and Chaves 1993).<sup>3</sup>

Although American society did not experience the widespread decline in traditional forms of religiosity that Leuba predicted, later research did support Leuba's assertions about the differences between scientists and the general population.<sup>4</sup> Using data from a 1958 poll of American graduate students, Rodney Stark examined religiosity among graduate students in the sciences, discovering those who attend elite institutions are the least likely to have a religious affiliation or regularly participate in worship services, views he revised in later work (Stark 1963, 2003). Still other researchers argue that those who go through higher education in scientific training do not necessarily become irreligious (Wuthnow 1985). Although there are exceptions, the general tenor of older research on the religious beliefs of scientists (Faia 1976; Leuba 1916, 1934; Stark 1963), however, supports the perception there is a conflict between the principles of religion and those of science, such that those who pursue science tend to abandon religion, either because of an inherent conflict between knowledge claims or because scientific education exerts a secularizing force.

### Field-Specific Differences between Natural and Social Scientists

Another significant area of research on the religious beliefs of scientists surrounds the broad field-specific differences in religiosity between natural and social scientists, with some scholars arguing that social scientists are significantly less religious than natural scientists. The largest study of American faculty is the Carnegie Commission faculty study, a survey of more than 60,000 U.S. professors, initially completed in 1969 (Trow and Associates 1969) and then replicated in 1984 (Trow and Associates 1984). Although the purpose of the Carnegie study was not to specifically study faculty attitudes towards religion, the survey did ask basic questions about religion such as: "How often do you attend religious services?"; "What is your present religion?"; "How religious do you consider yourself?"; and "Do you consider yourself religiously conservative?" According to the 1969 survey, which included most of the questions on religion, 42 percent of those in the life sciences "regularly attended religious services" when compared to 32 percent of political scientists, 38 percent of sociologists, and only 20 percent of

3. In particular, see 1997 and 1998 Gallup Polls (Gallup and Lindsay 1999). Some researchers have challenged these church attendance figures. See, for example, an article by Hadaway, Marler, and Chaves 1993.

4. In 1998, Edward J. Larson and Larry Witham, a historian and a journalist, replicated Leuba's exact questions about belief in a personal god, belief in human immortality, and desire for immortality among 1,000 scientists (biologists, physicists, and mathematicians) randomly selected from the current edition of *American Men and Women of Science*, which includes both those in the public sector as well as the academy. The RAAS study differs substantially from this study, studying only academic scientists and including those from seven different disciplines, social scientists as well as natural scientists.

faculty in psychology. Although the Carnegie data are outdated, since there is so little research in this area, these findings are still referred to in secondary literature (Stark and Finke 2000).

Researchers who discuss the natural and social science distinction in religiosity generally use the claim that social scientists are less religious than natural scientists to argue that there is not an *inherent* conflict between religion and science, since we would expect the natural science disciplines to have the greatest commitment to scientific method. Drawing on the Carnegie data, Rodney Stark and Roger Finke state in their work *Acts of Faith* (2000):

But perhaps the most striking finding is that on each of these measures, faculty in the 'hard' sciences turned out to be *far more likely* [emphasis added] to be religious than were their counterparts in the 'softer' social sciences: they attended church more regularly, were more likely to describe themselves as 'deeply' or 'moderately' religious, or to say they were 'religiously conservative,' and they were far more likely to claim religious affiliation (p. 53).

Other studies generate similar findings about the field-specific differences in religiosity between natural and social scientists, contending that social scientists are *less* religiously involved than those in the natural sciences (Lehman and Shriver 1968; Thalheimer 1973).

Researchers advance diverse theories for the supposed field-specific differences in religiosity. Some scholars contend that such distinctions are a result of "scholarly distance from religion" (Faia 1976; Lehman and Shriver 1968). Edward Lehman and Donald Shriver argue in earlier work, for example, that those in fields where the content of religion is not placed under scholarly inquiry, such as physics or chemistry, may be *more* religious than those who are in fields that actually study religion. That is, natural scientists might be better able to compartmentalize religious and scientific worldviews, finding it easier to maintain belief (Lehman and Shriver 1968). In contrast, because their work often puts religion under the lens of science, individuals in the social sciences may find it hard to believe, making it less likely that they will maintain active religious participation.

Robert Wuthnow argues, in contrast to the above view, that since most social scientists do not directly study religion such differences in religiosity between scholars in the natural and social sciences are better explained by "boundary posturing mechanisms." Scholars in the social sciences may want to create distance between themselves and the general public to retain a sense of "otherness" (Wuthnow 1985). Fields such as physics or chemistry have already created distance from the American public through adopting highly codified, particular languages and ways of operating. They do not need to create uniqueness via establishing social distance from religion. In contrast, scholars in disciplines with less specialized languages and methods (such as the social sciences) are consequently more understandable to the general public. This makes it difficult for social scientists to seem distinctive from non-academics. Appearing not to accept religion is one way of creating this distinction (Wuthnow 1985).

If such field-specific differences do in fact exist, another possible theory would be that since social scientists study human cultures they may adopt relativistic accounts to explain the phenomena they study in contrast to the more naturalistic accounts employed by those in the natural sciences. Since most forms of religion make truth claims, social scientists would consequently be less likely to be religious adherents.

These existing approaches to examining religiosity among academic scientists are deficient in several areas. Most important, the data are old, with no systematic examination of the religious beliefs of academic scientists since the mid-1980s. The present study provides such an update. Current scholarship continues to assert the untested assumption that field-specific differences in religiosity between natural and social scientists hold for today's scholars. Researchers have also neglected to explore the influence of other factors on religiosity among academics, factors such as gender, age, and family status, which influence religiosity for those in the general population. Finally, there is little discussion that links studying the diversity in religiosity among academic scientists to differences between the public and the scientific community. We fill many of these gaps in the existing research.

## Data and Methods

The data we examine were part of a broader study of religion, spirituality, and ethics among academics in seven different natural and social science disciplines at twenty-one elite U.S. research universities.<sup>5</sup> Faculty members included in the study were randomly selected from seven natural and social science disciplines at universities that appeared on the University of Florida's annual report of the "Top American Research Universities" (Lombardi et al. 2006). The University of Florida ranked elite institutions according to nine different measures, which included: total research funding, federal research funding, endowment assets, annual giving, number of national academy members, faculty awards, doctorates granted, postdoctoral appointees, and median SAT scores for undergraduates. These measures were similar to those used in other studies that examined elite universities (Bowen and Bok 1998; Massey et al. 2002). Universities were ranked and selected according to the number of times they appeared in the top twenty-five for each of these nine indicators.

During a seven-week period from May through June 2005, the study's PI randomly selected 2,198 faculty members in the disciplines of physics, chemistry, biology, sociology, economics, political science, and psychology from the universities in the sample. Although faculty were randomly selected, oversampling occurred in the smaller fields and undersampling in the larger fields. For example, a little more than 62 percent of all sociologists in the sampling frame were selected, while only 29 percent of physicists and biologists were selected, reflecting the greater numerical presence of physicists and biologists at these universities when compared to sociologists. In analyses where discipline was not controlled for, we used data weights to correct for the over/under sampling. Table 1 describes the sample and weighting in greater detail.

An initial contact letter was written by the PI and contained a fifteen-dollar cash pre-incentive (i.e., the PI and research team sent fifteen dollars in cash to each of the potential respondents regardless of whether they decided to participate in the survey). Each respondent received a unique ID with which to log into a Web site and complete the survey. After five reminder e-mails the research firm commissioned to field the survey, Schulman, Ronca, and Bucuvalas, Inc (SRBI), called respondents up to a total of 20 times, requesting participation over the phone or Web. Six and a half percent of the respondents completed the survey on the phone and 93.5 percent completed the Web-based survey. Overall, this combination of methods resulted in a relatively high response rate of 75 percent or 1,646 respondents, ranging from a 68 percent rate for psychologists to a 78 percent rate for biologists. This is a high response rate for a survey of faculty. For example, even the highly successful Carnegie Commission study of faculty resulted in only a 59.8 percent rate (Ladd and Lipset 1972).

The survey asked some questions on religious identity, belief, and practice, which were replicated from the General Social Survey (GSS) (Davis, Smith, and Marsden 2005), and other questions on spiritual practices, ethics, and the intersection of religion and science in the respondent's discipline, some of which were replicated from other national surveys. There was also a series of inquiries about academic rank, publications, and demographic information. Table 2 shows the demographics of the sample.

For this article, data about religious identity, belief, and practice were analyzed from the RAAS survey. These included questions about the respondent's view of religion, God, and church attendance. Basic frequencies of these outcomes are shown in Table 3. The questions that were replicated from the General Social Survey (GSS) to allow for comparisons between the general population and academic scientists. Specifically, we compared the responses of scientists to the general population on measures of current and childhood religious affiliation

5. In addition to a survey of 1,646 faculty members, the final data also consists of 271 in-depth interviews with a subsample of those who responded to the survey.

**Table 1 • Sample, Population, and Weighting Information**

	Number Sampled	Number of Respondents	Response Rate (Percent)	Percent of Sample	Number in Population	Percent in Population	Data Weight	Weighted Number of Respondents	Weighted Percent of Sample
Physics	327	241	73	12.9	1123	19.56	1.305894	315	19.6
Chemistry	300	214	71	11.5	719	12.53	.942092	202	12.5
Biology	371	289	78	15.5	1278	22.26	1.23932	358	22.3
Sociology	300	228	76	12.2	478	8.33	.58785	134	8.3
Economics	300	207	69	11.1	705	12.28	.954518	198	12.3
Political science	300	225	75	12.0	718	12.51	.894604	201	12.5
Psychology	300	205	68	11.0	719	12.53	.983452	202	12.5
Other <sup>a</sup>	—	36	—	1.9	—	—	1	36	—
Refused	—	1	—	.1	—	—	1	1	—
Total	2198	1646	74.8	100	5740	100	—	1646	100

<sup>a</sup>When asked to specify, the most common “other” disciplines were subfields (particularly in biology) such as “molecular biology” or interdisciplinary fields like “biochemistry,” “biological psychology (neuroscience),” and “social psychology.”

**Table 2 • Demographics of Natural and Social Scientists**

	Natural Sciences				Social Sciences				
	Physics	Chemistry	Biology	Overall <sup>a</sup>	Sociology	Economics	Political Science	Psychology	Overall <sup>b</sup>
Academic rank*									
Percent full professor	70.5	66.4	58.5	64.6	55.7	61.4	54.2	54.1	56.4
Percent associate professor (with tenure)	13.3	10.7	17.0	14.2	16.7	7.2	16.9	19.5	15.0
Percent assistant professor	15.4	19.2	22.8	19.3	25.9	29.0	26.7	24.9	26.7
Percent associate professor (without tenure)	.0	.9	.3	.3	.0	1.9	1.8	1.0	1.2
Percent other ranking	.8	2.8	1.4	1.5	1.8	.5	.4	.5	.7
Mean age	51.3	49.9	49.8	50.38	48.6	46.6	48.3	49.4	48.25
Percent currently married	85.4	84.8	85.4	85.2	80.4	81.5	82.2	75.2	79.8
Mean number of children <sup>†</sup>	2.20	2.18	2.46	2.30	2.33	2.11	2.27	2.19	2.21
Percent white	85.3	85.7	83.9	84.9	82.6	85.9	84.1	87.4	85.2
Percent black*	.4	1.0	1.1	.8	4.6	1.0	2.3	4.0	2.8
Percent Hispanic*	.9	1.0	1.8	1.3	4.6	3.5	5.5	1.0	3.5
Percent Asian*	12.5	9.4	12.9	11.9	4.6	9.1	5.0	6.0	6.3
Citizenship status*									
Percent non-immigrant, U.S. citizen	46.8	61.7	63.4	57.0	69.6	40.4	63.6	71.4	60.7
Percent first generation immigrant, U.S. citizen	20.3	15.3	11.6	15.6	8.5	12.3	9.3	9.9	10.1
Percent second generation immigrant, U.S. citizen	5.5	5.7	4.9	12.2	4.9	3.9	8.0	3.0	13.5
Percent non-U.S. citizen	17.7	12.9	14.4	15.3	10.3	35.5	9.3	6.4	15.7
Percent female*	9.2	12.0	26.1	16.7	35.3	13.3	27.1	34.5	27.0

<sup>a</sup>Weighted to match population.

\*Pearson Chi-Square  $p < .05$  (two-tailed tests) <sup>†</sup>One-way ANOVA  $p < .05$

**Table 3 • Religious Beliefs of Natural and Social Sciences by Discipline**

	Natural Sciences					Social Sciences				Overall	
	Physics	Chemistry	Biology	Overall	Sociology	Economics	Political Science		Psychology		
							Political Science	Psychology			
Which one of the following comes closest to your views about religion?											
“There is very little truth in any religion.”	33.2	23.2	27.9	28.6	21.9	29.3	14.9	24.5	22.8		
“There are basic truths in many religions.”	63.5	74.2	69.4	68.5	76.2	67.4	76.6	74.5	73.5		
“There is the most truth in only one religion.”	3.4	2.6	2.6	2.9	1.9	3.3	8.5	1.0	3.7		
Which one of the following statements comes closest to expressing what you believe about God?											
“I do not believe in God.”	40.8	26.6	41.0	37.6	34.0	31.7	27.0	33.0	31.2		
“I do not know if there is a God and there is no way to find out.”	29.4	28.6	29.9	29.4	30.7	33.3	32.5	27.8	31.0		
“I believe in a higher power, but it is not God.”	8.1	9.4	7.7	8.2	11.8	4.9	5.5	7.7	7.2		
“I believe in God sometimes.”	2.8	6.3	4.1	4.2	2.8	4.9	5.0	7.7	5.4		
“I have some doubts, but I believe in God.”	12.8	18.2	10.0	12.9	11.8	14.8	21.5	12.9	15.5		
“I have no doubts about God’s existence.”	6.2	10.9	7.4	7.8	9.0	10.4	8.5	10.8	9.7		
Religious service attendance											
More than once a week	.9	2.0	1.1	1.2	.9	1.5	1.8	1.5	1.5		
Once a week	2.6	11.4	5.6	5.8	6.7	8.5	8.3	4.9	7.1		
2 to 3 times a month	7.8	5.0	4.9	5.9	7.6	4.0	7.8	4.4	5.8		
Once a month	3.9	4.5	2.8	3.6	4.0	4.0	4.1	4.9	4.3		
6 to 11 times a year	5.2	5.5	4.9	5.1	4.0	3.0	3.7	6.9	4.5		
1 to 5 times a year	22.9	22.4	23.5	23.1	27.6	28.6	26.1	24.1	26.5		
Not at all in the past year	56.7	49.3	57.2	55.3	49.3	50.3	48.2	53.2	50.3		



using GSS data from 1998 and 2004 (Davis, Smith, and Marsden 1998, 2004).<sup>6</sup> We also present logistic regression models predicting scientists' religious behaviors and attitudes.

## Findings

We begin by examining how scientists differ from the general population. Then we consider difference within the academy, focusing first on comparing the broader natural and social science fields and then comparing the specific disciplines. Other factors that might influence religiosity among academic scientists are also explored. In the conclusions, we offer implications of these external and internal differences, a discussion of the populations to which these findings might be generalized, as well as possible theoretical models for understanding the role of religion in the lives of academic scientists at elite research universities.

### *Distinctions: Scientists and the General Public*

Table 4 compares the general U.S. population, according to questions from the GSS, to the population of academic scientists who participated in the RAAS study. While nearly 14 percent of the U.S. population self-describes as "evangelical" or "fundamentalist," less than 2 percent of the RAAS population identifies with either of these combined labels (Marsden 1991; Smith et al. 1998).<sup>7</sup> The only traditional religious identity category where the RAAS population has a much higher proportion of religious adherents than the general population is among those who identify as Jewish (Sarna 2003).<sup>8</sup> While out of all participants in the GSS, a little less than two percent of the respondents identify as Jewish, about 15 percent of the academic scientists identify as Jewish. Based on our other findings it is likely that many of those who identify as Jewish in the RAAS survey would also identify as reformed or liberal Jews rather than with the conservative or Orthodox traditions. For example, one of the questions on the RAAS survey was: "Compared to most Americans where would you place your religious views on a seven-point scale?" The lower numbers on the scale indicated liberal views and the higher numbers conservative views. Among the academic scientists who identified as Jewish, the mean was 2.19. Recognizing the current diversity in practice and belief among those who identify with the label "Jewish" (Sarna 2003), we infer from this finding that most academic scientists who are Jewish would also associate with a less traditional form of Judaism, since it is unlikely that the Orthodox, for example, would describe their religious beliefs as "extremely liberal."

Most salient, about 52 percent of the scientists see themselves as having no religious affiliation when compared to about 14 percent of the entire GSS population. These results seem to confirm other research, which shows that a much smaller proportion of academics identify with traditional religious identity categories when compared to the general U.S. population (Stark 1963; Stark and Finke 2000).

### *Disciplines and Fields: Scientists and the Sciences*

Our second central research question asks whether natural and social scientists differ significantly in their levels of religiosity. In Table 5 we present three logistic regression models

6. The 1998 GSS had 2,832 respondents, although only half of the sample was asked the expanded set of religion and spirituality questions (Davis, Smith, and Marsden 1998). The 2004 GSS had 2,812 respondents (Davis, Smith, and Marsden 2004).

7. We recognize there is a historical difference between those who identify as "fundamentalist" and those who identify as "evangelical." For ease of comparability, however, we have collapsed these categories here. Marsden (1991) and Smith et al. (1998) discuss the nuances in meaning of these religious categories in greater detail.

8. We draw readers' attention to the complexity of the term "Jewish," which can connote both ethnic and religious categories. The survey data do not allow insight into the nuances individuals intended by this self-identification.

**Table 4 • Religious Self-Identification of Natural and Social Scientists Compared to General Population<sup>d</sup>**

	Scientists <sup>a</sup>	U.S. Population <sup>b</sup>
Current affiliation		
Evangelical/fundamentalist	1.5	13.6
Mainline Protestant	2.9	9.5
Liberal Protestant	10.8	9.9
Other/no Protestant identification	1.5	21.4
Traditional Catholic	.7	6.9
Moderate Catholic	1.7	7.4
Liberal Catholic	6.2	7.0
Other/no Catholic identification	.1	3.9
Jewish	15.3	1.8
Buddhist	1.8	.3
Hindu	1.0	.2
Muslim	.5	.5
Eastern Orthodox	.8	.4
Other Eastern	.2	.1
Other	3.0	3.0 <sup>c</sup>
None	51.8	14.2
Affiliation as a child		
Protestant	39.0	54
Catholic	22.6	31
Jewish	18.5	2.2
Other	6.5	4.6
None	13.4	8.3

<sup>a</sup>Weighted to match population.

<sup>b</sup>Data from the 1998 General Social Survey (Davis, Smith, and Marsden 1998).

<sup>c</sup>Includes "other," "Christian," Native American, non-denominational.

<sup>d</sup>Numbers may not add up to 100 percent due to rounding.

predicting scientists' views towards belief in God, whether there is any truth in religion, and their attendance at religious services. This combination of predictors covers both attitudinal and behavioral aspects of religion, since the predictors that explain religious beliefs may not be the same ones that explain practice.<sup>9</sup>

We see inconsistent and unconvincing evidence that the much discussed field-specific differences between natural and social scientists still exist. If there is something endemic to the natural (or social) science fields that causes scientists in those fields to be more or less religious we would expect the four social science disciplines of sociology, economics, political science, and psychology, to consistently differ from the reference category of physicists, while the two other natural science disciplines should not differ significantly from physicists. These patterns, however, do not appear in the data. While political scientists do appear somewhat more likely to have few doubts about God's existence and more likely to believe there is truth in religion when compared to physicists, chemists also score higher on all three religiosity

9. There may be some distinct differences in responses to the questions. For example, adhering to the "sometimes believe" may be different than responding to the "no doubts" position on the existence of God. Our goal with this article, however, is to present a broad composite picture of the religious beliefs and practices of scientists in different disciplines as well as scientists compared to the general population. Future articles generated from these data will go into more depth about particular aspects of scientists' religious beliefs, which are outside the scope of the present article.

outcomes compared to physicists. Furthermore, differences in the religiosity measures for economists and psychologists are not significantly different from physicists. These results show that any interdisciplinary diversity in religious belief or approach to religion cannot be described according to clean field-specific differences between natural and social scientists, especially after considering other demographic factors. These results confirm information gleaned from the frequencies presented earlier in Table 3. Looking at the 'religious truth' outcome, more natural scientists answer that there is very little truth in religion. This difference is deceptive, though. When looking at each individual discipline, it is clear that this natural-social difference is mainly due to the low number of political scientists expressing this view and the high number of physicists, not a clear difference between all natural and social science disciplines. In short, there is not a consistent trend between the natural-social categories. Furthermore, when differences between natural and social scientists are discovered they are very small.

Given that previous scholars debated the possible theoretical significance of interdisciplinary differences in religiosity, field-specific differences (Stark and Finke 2000) as well as differences between disciplines themselves (Lehman and Shriver 1968), we draw attention to the direction of the coefficients. Almost all of the coefficients are in the positive direction, meaning that physicists score the lowest on all of the religiosity measures. We caution readers not to make too much of these differences, however, since most of the coefficients are not significant.

The one exception is among biologists, whose coefficients on the God and attendance measures show a tendency toward lower levels of religiosity than physicists. If such differences are found more generally, they could mean that many of the perceived conflicts between religion and science occur mainly among biologists. Perhaps this reflects the contentious relationship between religion and science for some in biology, a discipline that deals the most directly with evolutionary theory (under question by some religious groups) when compared to the other sciences. Larger populations of particular disciplines should be studied more extensively in future research.

In sum, there is much discussion about the differences in religiosity between natural and social scientists. Findings from the RAAS data make a strong correction to these oft-cited, older findings by showing that field-specific differences in religiosity between natural and social scientists are simply no longer a meaningful descriptor of the place of religion in the academy. For the most part, there is little difference between these larger fields or between the specific disciplines themselves. The differences that do exist are seen among chemists and political scientists who are more likely to be religious, according to traditional indicators, when compared to physicists.

### ***Demographics: Gender, Generation, and Family Effects***

Since the particular discipline a scientist is trained in has little to do with individual religious beliefs or practices, to build theory about differences in religiosity within the academic scientific community we move next to examining variables that explain religiosity in the general population. In Table 5 we expand analyses beyond disciplinary differences to incorporating other variables that could explain some of the variation in the religious beliefs of academic scientists. The academy is not a homogenous institution, nor is its heterogeneity captured purely by disciplinary differences. Since gender, age, family characteristics, and immigrant generation are all important predictors of religiosity in the general population, we begin by examining how these factors work among this population of academic scientists (Miller and Stark 2002; Ozorak 1996; Stark 2002).

We find some surprising results when looking at the role of gender and age. Although a variety of scholarly reasons are provided for gender differences in religious belief and commitment, there is almost universal agreement that women tend to be more religious than

**Table 5 • Binary Logistic Regression for Religious Attitudes and Behaviors (Exponentiated Coefficients)**

	<i>There is very little truth in any religion.</i>	<i>I do not believe in God.</i>	<i>I have not attended religious services in the last 12 months.</i>
Discipline			
Physics (reference)	—	—	—
Chemistry	.539*	.570*	.791
Biology	.818	1.106	1.180
Sociology	.530*	.776	.819
Economics	.689	.645	.750
Political science	.344**	.581*	.801
Psychology	.675	.792	.998
Other	.777	.980	1.071
Foreign born	1.415*	1.162	1.552**
Female	.751	.951	1.017
Age			
18 to 35 (reference)	—	—	—
36 to 45	.852	1.155	1.171
46 to 55	.843	1.560*	1.430
56 to 65	.675	1.585*	1.585*
Over 66	1.207	1.552	1.482
Marital status			
Currently married (reference)	—	—	—
Cohabiting	2.102*	1.481	1.409
Widow	.514	1.523	.316
Divorced	1.558	1.065	.865
Separated	2.632	.983	.824
Never married	.749	.780	1.384
Number of children <sup>a</sup>	.844**	.960	.739**
Importance of religion as child	.734**	.598**	.607**
Religion as a child			
Raised Protestant	.364**	.648*	.550**
Raised Catholic	.819	.674	.722
Raised Jewish	1.021	1.030	.526**
Raised other	.444*	.609	.591
Raised none (reference)	—	—	—

<sup>a</sup> Coded as (1) no children at all, (2) no children under 18, (3) one child under 18, (4) two or three children under 18, (5) more than three children under 18.

\* $p < .05$  \*\* $p < .01$  (two-tailed tests)

men (Freese 2004; Miller and Hoffman 1995). When examining differences in religiosity between men and women in the sciences, however, we find that gender is *not* a significant predictor for any of our religion measures. That is, academic scientists who are women, when compared to men, are not significantly more likely to believe in God, believe that religion provides truth, or to regularly attend a house of worship.

Similarly, although data from the GSS reveal that older individuals express higher levels of religious belief and practice when compared to younger individuals, we do not find this relationship among scientists.<sup>10</sup> The age predictors have no significant effect on whether scientists

10. In the 2004 GSS, 49 percent of respondents 65 or older said they had a "strong religious preference" compared to only 29 percent of 18 to 30 year olds, 39 percent of 31 to 44 year olds, and 41 percent of 45 to 64 year olds (Davis, Smith, and Marsden 2004).

say there is little truth in religion. We do note, however, that the middle age cohorts are more likely than the youngest scientists (18 to 35) to say that they do not believe in God. A similar pattern is seen with the attendance measure, with those 56 to 65 more likely than the youngest group to report not attending religious services over the past year.

Family status is also a significant predictor of religiosity in the general population, with married individuals who have children more likely to attend a house of worship than those who are childless and unmarried (Roozen, McKinney, and Thompson 1990). Indeed, we find that, unlike the gender and age predictors, most of the family characteristics generate the same effect among scientists as they do among the general population. When partnership status is added to the model, the “cohabiting without being married” is a significant predictor of views toward religion. Those who cohabit are more likely than married scientists to believe there is little truth in religion. None of the partner status categories, including cohabitation, however, are significant predictors of religious attendance or having a belief in God. We also find that scientists with more children are less likely to believe there is little truth in religion and less likely to go a year without attending religious services.

Recent research on religiosity among the foreign-born based on the New Immigrant Survey Pilot finds that a lower percentage of immigrants, when compared to those in the general population, practice some form of religion (Cadge and Ecklund 2006; Jasso et al. 2003). Similar to findings from the New Immigrant Survey, analysis of the RAAS data reveals that foreign-born scientists are more likely to say that there is little truth in religion and less likely to attend religious services. Being foreign-born had no significant impact on the odds of believing in God, however. These findings are particularly interesting in light of the high number of foreign-born in the data set (see Table 2).

### *Childhood Religiosity*

The factors considered so far explain some of the intra-scientist differences. They do not, however, provide much insight towards understanding differences in religiosity between scientists and the general population. The demographic variables provide potential insight, although not conclusive evidence. For example, if both scientists and the general population become more religious when they have children, then maybe the low religiosity of scientists is due to their low fertility rates. However, the data in Table 2 reveal that scientists’ fertility rates are similar to those among the general population, with scientists on average having about two children.<sup>11</sup> More importantly, these types of differences would not explain the extent of the distinctions seen in Table 4, which compared religious affiliation of the general population with the scientists.

Measures of childhood religiosity, the final set of predictors seen in Table 4, provide greater potential for understanding differences between academic scientists and the general population. We added two measures of childhood religiosity or upbringing. The first is a set of predictors representing the tradition in which the respondent was raised and the second is the scientists’ reported “importance of religion in your family while you were growing up.” The latter is measured by four responses ranging from “very important” to “not at all important.” We find that scientists raised as Protestants are more likely to retain religious beliefs and practices than those raised without a religious affiliation. Similarly, those who say that religion was important in their family when growing up are less likely to say that they currently do not see truth in religion, do not believe in God, and do not attend religious services.

11. See the Negative Population Growth Web site (Negative Population Growth 2006; data from the 2000 U.S. Census). In order to extensively test the role of fertility as a possible moderating variable between scientific occupation and religiosity, we would need to do regression analyses with a general population that includes an oversample of scientists. We do not have this data set available and our initial observation that there are almost no differences on average in fertility rates between academic scientists and the general population did not make this a logical step of analysis.

Another way to examine the impact of religious upbringing is through predicted probabilities. For instance, consider two sociologists who are male, in the 18 to 35 range, born in the United States, have no children, and are currently married. One was raised some form of Protestant and religion was “very important” while growing up. The other was raised as a religious “none” and religion was “not at all important” while growing up. The former has a predicted probability of 14 percent for saying that he does not believe in God. This compares to a 54 percent chance of the latter saying he does not believe, a striking difference. Such differences do not offer conclusive evidence about the causes of disproportionate self-selection of scientists from certain religious backgrounds into the scientific disciplines. They do offer potential theoretical pathways for explaining the differences in religiosity between scientists and the general population.

These findings become even more important when reexamining Table 4, which compares the religious upbringing of the general population with that of scientists. We find that, overall, when compared to the general population, a larger proportion of scientists were raised in liberal Jewish or non-religious homes.<sup>12</sup> When one considers that scientists come disproportionately from non-religious or religiously liberal backgrounds, the distinctions between the general population and the scientific community make more sense. These data reveal that at least some part of the difference in religiosity between scientists and the general population is likely due simply to religious upbringing rather than scientific training or institutional pressure to be irreligious.

## Discussion and Conclusions

It is an assumption of much scholarly work that the religious beliefs of scientists are a function of their commitment to science. The findings presented here show that indeed academics in the natural and social sciences at elite research universities are less religious than many of those in the general public, at least according to traditional indicators of religiosity. Assuming, however, that becoming a scientist *necessarily* leads to loss of religious commitments is untenable when we take into account the differential selection of scientists from certain religious backgrounds. Our results indicate that people from certain backgrounds (the non-religious, for example) disproportionately self-select into scientific professions. In contrast, being raised a Protestant and in a home where religion was very important, for example, leads to a greater likelihood that a scientist will remain relatively religious.

We found that the oft-discussed distinction between the natural and social science fields was inconsistent and weak. Common predictors of religiosity in the general population operated quite differently among academic scientists. Although gender was a significant predictor of religiosity in the general population, with women more likely than men to be religious, in the RAAS population gender was not a significant predictor of religiosity. Although such assessments are made cautiously, given that the GSS data and the RAAS data were collected at different points in time and with different methodologies (face-to-face interview [GSS] versus Web and phone based [RAAS]), these analyses make a strong case that future research ought to examine the possible self-selection effect operating among women in the natural and social sciences, with women who go into the natural or social science disciplines less likely to be religious when compared to women in the general population.

Age had a surprising effect on religiosity when compared to those in the general population, with the younger scientists *more likely* to believe in God than the older scientists. If this finding holds throughout the career life-course for this recent cohort of academic scientists, such differences could indicate an overall shift in attitudes towards religion among those in

12. In the 2004 GSS, 100 percent ( $n = 60$ ) of the respondents who were raised Jewish say that they are religious “liberals” (Davis, Smith, and Marsden 2004).

the academy. Further, increases in the number of children in the household also increased likelihood of adherence to a religion. This may be because those who are more religious have more children or because having children provides some renewal of commitment to religion. Such assertions could be tested more conclusively with life-course data.

Finding that the strongest predictor of religious adherence among this group was childhood religiosity recasts previous theories about lack of religiosity among academic scientists in a new light. The idea that scientists simply drop their religious identities upon professional training, whether due to an inherent conflict between science and faith or institutional pressure, is not strongly supported by these data. If this was the case, then religious upbringing would have little effect on religion among scientists, with even those scientists who were raised in religious homes losing religion once they entered the academy or received scientific training. Instead, as shown by our results in Table 5, religious socialization and heritage remains the strongest predictor of present religiosity among this population of scientists. When we compare this group of academic scientists to the general population we find that scientists were disproportionately selected from homes where there was no religion or where religion was not important. The relationship between these backgrounds and low scores on measures of belief and practice exist in the general population, not just among scientists. For example, 15 percent of respondents to the 1998 General Social Survey who were raised in homes with no religion said they did not believe in God compared to 1.6 percent of those raised Protestant. Academic science has a disproportionately large number of people raised with no religion, potentially producing many more people who do not believe in God. Since these data do not allow comparison of religious switches during the life course we cannot determine conclusively what kind of predictors function to keep scientists in one type of religion compared to another (Sherkat and Wilson 1995). A panel data set that follows the same group of faculty over time would be better able to address these kinds of issues.

Of course, this obviously raises the question of why scientists are self-selected from non-religious households or households where religion does not play a major role. This is a question that will need further exploration beyond the data presented here. We will, however, provide some possible routes of inquiry. In some cases this selection effect may indeed be due to the tension between the religious tenets of some groups (e.g., those that advocate young earth creationism) and the theories and methods of particular sciences. On the other hand, some of the selection effect may simply be due to differential emphasis on education and/or differential resources. These could be mediating factors between religious background and likelihood of becoming a scientist or independent from religious background. The possibility of such mediating factors reveals that the story is unlikely to be the simple one of "religion is contradictory to science and hence religious individuals do not go into science." Finding that scientists who are raised religious often stay relatively religious casts doubt on this simple cause and effect scenario.

Another possibility is that religious individuals might select into science graduate programs equally but that the graduate programs and scientific environments themselves have strong anti-religious messages and reward structures, either passive or active, such that some abandon their faith in the process and others leave programs. To study the previous we would need data not just on faculty at elite institutions but a data collection including a broader set of individuals in the academic sciences (graduate students, postdoctoral fellows, researchers, in addition to faculty) as well as the ability to follow these same individuals over time.<sup>13</sup>

The population of academic scientists surveyed for the RAAS study comes from a selection of the most elite research universities in the United States. It may be that academic scientists at elite research universities are significantly different than those at other kinds of research universities in ways that would influence religiosity. One possibility is that there is a

13. We thank an anonymous reviewer for this insight.

kind of pressure towards ir-religiosity as a marker of legitimacy, which is found at elite institutions but not at other kinds of institutions.<sup>14</sup> If future research finds evidence that faculty who received undergraduate degrees from religiously-based colleges, for example, are discriminated against in the hiring process *more* at elite universities when compared to less elite institutions, this would support a theory that takes into account institutional differences in elite status as a correlate of faculty religiosity.

We expect that students, at least undergraduate students at the universities studied, will be significantly more religious than faculty at these schools. Research on education in the general population reveals that a four-year college or university degree is becoming ever more common and that overall the religious are as educated as the general population, although some forms of religion tend to impede educational advancement (Darnell and Sherkat 1997).<sup>15</sup> Other research shows that religiosity and the presence of religious groups is on the rise at elite college campuses (Bartlett 2005). Consequently, we would expect that undergraduate students at the universities selected for the RAAS study would be significantly more religious than the professors who are teaching them.

The population of academic scientists that we would expect to be more religious than the RAAS population would be those who teach at religiously-affiliated universities and colleges, particularly faculty at institutions that require adherence to a particular statement of faith commitments. Previous research on faculty at a variety of different religiously-affiliated universities, (Notre Dame, Baylor University, Brigham Young, and Boston College), show that the majority of faculty at these institutions valued religious and academic commitments simultaneously. Only the faculty at Brigham Young seemed dedicated to religious goals over academic goals. The study also found that as an institution, Brigham Young was more likely than the other schools to privilege faith commitments in hiring decisions (Lyon, Beaty, and Mixon 2002).

These findings also have implications for the current social issues related to public discussion about the connection between religion and science that motivated these analyses. In the wake of recent public events about teaching intelligent design and evolution in public schools (Behe 2005), we see the necessity of increasing dialogue between scientists and the general public as important and timely. If we assume for a moment that a dialogue between religious non-scientists in the general population and the kind of academic scientists who responded to the RAAS survey is indeed desirable (discussing the relative pros and cons of creating a dialogue between these groups is beyond the scope and purpose of this article), then these results have direct implications for efforts towards such dialogue. Since academic scientists appear to be much less religious than the American population as a whole, there are two possibilities for increasing discussion about religion and science between scientists and the American public with the goal of advancing science. Scientists lament a lack of scientific understanding among the U.S. population (Scientific American 2005; Lakoff 2005). While the general American public may indeed have a less than desirable understanding of science, our findings reveal that academic scientists may have much less experience with religion than many outside the academy. Our findings also reveal there is clearly a sizeable minority of academic scientists who are committed religious adherents and thus potentially crucial commentators in the context of an American public trying to find a way to meaningfully connect religion and science. That the scientists in this population are from elite universities makes them all the more poised to productively contribute to significant dialogue about what distinguishes scientific and religious claims.

14. See, in particular, the results of a recent survey of faculty political attitudes by Gross and Simmons (2006), which shows those at elite universities may be different religiously and politically when compared to those at less elite institutions.

15. See, in particular, U.S. Census Table A-2: Percent of People 25 Years or Older Who Have Completed High School or College, by Race, Hispanic Origin and Sex: Selected Years 1940 to 2004 (U.S. Census Bureau 2005).



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