A Global Lab
Religion among Scientists in International Context

December 3, 2015 • BioScience Research Collaborative

Hosted by the Religion and Public Life Program at Rice University
ACKNOWLEDGEMENTS

The Religion Among Scientists in International Context (RASIC) study received major funding from the Templeton World Charity Foundation (TWCF) (Grant #TWCF0033/AB14), with support from Rice University and the Faraday Institute at University of Cambridge. Principal Investigator Elaine Howard Ecklund and co-Principal Investigators Kirstin R.W. Matthews and Steven W. Lewis express their sincere thanks to the TWCF for its support of this research.

Social Sciences Advisory Board:
Pierre Bréchon, Professor of Political Science, Institut d’Etudes Politiques de Grenoble
Helen Rose Ebaugh, Professor Emeritus of Sociology, University of Houston
Mahmoud El-Gamal, Professor of Economics and Statistics; Chair of Islamic Economics, Finance, and Management, Rice University
John Evans, Professor of Sociology and Associate Dean, Division of Social Sciences, University of California, San Diego
Prema Kurien, Professor of Sociology and Director of Asian/Asian American Studies, Syracuse University
Elizabeth Long, Professor Emerita, Department of Sociology, Rice University
Ipek Martinez, Associate Dean of Social Sciences, Rice University
Chantal Saint-Blancat, Associate Professor of Social Sciences, University of Padova
Laurel Smith-Doerr, Professor of Sociology and Director of the Institute for Social Science Research, University of Massachusetts at Amherst
David Voas, Professor of Population Studies, Institute for Social and Economic Research, University of Essex
Fenggang Yang, Professor of Sociology and Director of the Center on Religion and Chinese Society, Purdue University

Natural Sciences Advisory Board:
Ugo Amaldi, Università degli Studi di Milano-Bicocca, Italy
Yildiz Bayazitoglu, Professor of Materials Science and NanoEngineering and Harry S. Cameron Chair in Mechanical Engineering, Rice University; Honorary Member, Turkish Academy of Sciences
Gianpaolo Bellini, Istituto Nazionale di Fisica Nucleare (INFN), Italy
Francesco Bertola, Università degli Studi di Padova, Italy
Cemil Çelik, Rector of Inonu University, Turkey
Dipshikha Chakravorty, Associate Professor of Biology, Indian Institute of Science, India
Dipankar Chatterji, President, Indian Academy of Sciences and Professor of Biology, Indian Institute of Science, India
Paul C. W. Chu, Professor of Physics and T.L.L. Temple Chair of Science in the College of Natural Sciences and Mathematics at the University of Houston; President, Hong Kong University of Science and Technology (2001-2009)
Robert Curl, University Professor Emeritus, Pitzer-Schlumberger Professor of Natural Sciences Emeritus, and Professor of Chemistry Emeritus, Rice University
S. Semahat Demir, Rector of Istanbul Kültür University, Turkey
Aldo Fasolo, Università degli Studi di Torino, Italy
Mario Guzzi, Università degli Studi di Milano-Bicocca, Italy
George Wei-Shu Hou, Distinguished Professor of Physics, National Taiwan University
Alice S. Huang, Senior Faculty Associate in Biology, California Institute of Technology
Neal Lane, Malcolm Gillis University Professor Emeritus and Professor of Physics & Astronomy Emeritus, Rice University; Senior Fellow in Science and Technology Policy at the James A. Baker III Institute for Public Policy
G. Balakrish Nair, Executive Director, Translational Health Science and Technology Institute (Department of Biotechnology, Government of India)
Meral Özgüç, Professor of Medical Biology, Hacettepe University, Turkey
Giuliano Francesco Panza, Università degli Studi di Trieste, Italy
Andrea Pession, Università di Bologna, Italy
Alberto Pimpinelli, Executive Director, Rice Quantum Institute, Rice University; Former Scientific Attaché for Physics, French Embassy, USA
ACKNOWLEDGEMENTS

C.N.R. Rao, National Research Professor and Honorary President, Jawaharlal Nehru Centre for Advanced Scientific Research, India
M.R.S. Rao, Honorary Professor and Former President, Jawaharlal Nehru Centre for Advanced Scientific Research, India
Lucio Rossi, Università degli Studi di Milano and CERN, Italy
Bernhard Schrefler, Professor of Structural Mechanics at the University of Padova and Secretary General of the International Centre for Mechanical Science (CISM) at Udine, Italy
Ajay K. Sood, Secretary General, World Academy of Sciences; Professor of Physics, Indian Institute of Science
Annick Suzor-Weiner, Professor Emeritus, Université Paris-Sud; Former Counselor for Science and Technology, French Embassy, USA
Asli Tolun, Professor of Biology, Bogazici University, Turkey
Paolo Tortora, Università degli Studi di Milano-Bicocca, Italy
Fiona M. Watt, Director of the Centre for Stem Cells and Regenerative Medicine, King’s College London School of Medicine

Ecklund, Matthews, and Lewis also gratefully acknowledge the contributions of nine researchers and staff members:
David Johnson, Postdoctoral Fellow, Rice University
Brandon Vaidyanathan, Director of Research, H.E. Butt Family Foundation
Sarah Hamshari, RASIC Research Project Manager, Rice University
Jared Peifer, Assistant Professor of Management, Baruch College
Christopher Scheitle, Assistant Professor of Sociology, West Virginia University
Esther Chan, Yale University
Katherine Sorrell, H.E. Butt Family Foundation
Laura Achenbaum, Senior Research Project Manager, Rice University
Hayley Hemstreet, Program Manager for the Religion and Public Life Program, Rice University

Our sincere thanks to Rice University administrators Dean of Social Sciences Lyn Ragsdale, President David Leebron, Senior Assistant To The President David Vassar, and Howard R. Hughes Provist Marie Lynn Miranda.

We also gratefully acknowledge the contributions of the following:
PROJECT OVERVIEW

More than 5.8 billion of the world’s 7 billion people claim some religious affiliation and most developed or developing economies are trying to grow their scientific infrastructure. Yet media pundits and scholars alike often see science as being in conflict with religion and the primary cause of secularization. Scholars argue that religion hinders the progress and acceptance of science in the United States, Europe, and parts of Asia. Until now, however, no research has addressed how scientists around the world view religion and how religion influences scientists in different national contexts. With the support of a grant from the Templeton World Charity Foundation, we have completed (from 2011-2015) the most comprehensive cross-national study of scientists’ attitudes toward religion and spirituality ever undertaken. The goal was to answer the following questions:

1. To what extent do scientists’ religious identities, beliefs, and practices influence their decision to go into science? Into a particular discipline?

2. In what ways do scientists’ beliefs about spirituality and religion affect their attitudes toward science?

3. To what extent do the religious beliefs of scientists influence their attitude toward, and decision-making about, the applications of science in different spheres of public life? How does religion facilitate the appropriation and understanding of science? How do scientists feel religion-state relationships influence the practice of science?

4. When it comes to religious character, are scientists more like one another than they are like the general population in their home regions?

5. How do scientists’ perceptions of religion influence their view of gender relations, perceptions of racial/national diversity, and other attitudes that affect scientific collaboration?

6. How do junior and senior scientists compare in their understandings of religion and spirituality, and the impact religion and spirituality have on science?

7. What religious challenges do scientists face?

In eight regions—France, Hong Kong, India, Italy, Taiwan, Turkey, the United Kingdom, and the United States—with different degrees of religiosity, varying levels of scientific infrastructure, and various relationships between religious and state institutions, we examined how junior and senior biologists and physicists at universities and research institutes approach religion and other issues influencing the social context of science (such as family life, commercialization, and international collaboration). In this report we focus primarily on religion. We created an overall sampling frame of 61,020 biologists and physicists and surveyed 22,525 of them. Of these scientists, 9,422 responded. We followed up with a subset of scientists to conduct 609 in-depth qualitative interviews. We asked questions to determine how they understand the relationship of science and religion (and, where relevant, spirituality), and how religion (and spirituality) influence their research agendas, daily interactions with students, and ethical decision making.

We find that, in most regions, scientists are indeed more secular than the general population. We also find that scientists do not think science is a secularizing influence; instead, most think religion and science operate in separate spheres. Our research reveals, however, that even in the most secular of regional contexts, science and religion generally do not seem to be in conflict in the lives of individual scientists. When we compare across regional contexts, we find that the idea that science and religion are in conflict is mainly a Western, Christian notion.

---

For scientists in all regions—even the most secular—there are specific ways in which religion and science overlap. Religious students enter scientific disciplines, for example, and certain forms of scientific research have religious implications. Religion does not exist in a social vacuum; it is part of an intersectional tapestry of identity (like immigrant status) and social organization. For example, there are specific areas where the scientific community does conflict with local religious communities, especially in regional contexts where an influx of immigrants introduces more traditional forms of religion. Indeed conflict between science and religion can further deepen in countries at the core of the global science infrastructure (such as the U.K. and France) when religious scientists from non-Western countries come to advance their careers.

The dataset, articles, and books we are producing from this study are reshaping the secularization debates, creating new measures of religion and secularism, as well as spirituality, (through testing their salience in different regional contexts among members of the same professional group), and initiating new research agendas within the social sciences and far beyond. Our findings are helping to improve efforts to increase productive dialogue between scientists and religious communities in different countries and regions by uncovering cross-national similarities and differences in how scientists perceive the relationship between science, religion, and spirituality, and translating these findings to significant media outlets and global community leaders.
RASIC AT A GLANCE

- Scientists in overall sampling frame: **61,020**
- Scientists surveyed: **22,525**
- Scientists who responded to survey: **9,422**
- Scientists interviewed: **609**
- Students and researchers who worked on the study: **101**
- Papers under review or in process to date: **17**
- National and International media hits to date: **40**
- Presentations given to date: **29**

### DEMOGRAPHIC CHARACTERISTICS OF SCIENTISTS, BY NATION:

<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>Hong Kong</th>
<th>India</th>
<th>Italy</th>
<th>Taiwan</th>
<th>Turkey</th>
<th>United Kingdom</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>26.2%</td>
<td>21.8%</td>
<td>34.5%</td>
<td>34.1%</td>
<td>28.1%</td>
<td>27.0%</td>
<td>44.7%</td>
<td>28.8%</td>
</tr>
<tr>
<td>Male</td>
<td>61.7%</td>
<td>64.6%</td>
<td>65.5%</td>
<td>56.9%</td>
<td>60.3%</td>
<td>39.7%</td>
<td>55.3%</td>
<td>62.3%</td>
</tr>
<tr>
<td>Percent with PhD</td>
<td>96.0%</td>
<td>68.2%</td>
<td>72.4%</td>
<td>55.4%</td>
<td>66.4%</td>
<td>73.6%</td>
<td>76.0%</td>
<td>61.8%</td>
</tr>
<tr>
<td>Discipline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td>38.0%</td>
<td>52.6%</td>
<td>55.4%</td>
<td>42.7%</td>
<td>68.1%</td>
<td>56.3%</td>
<td>49.8%</td>
<td>66.1%</td>
</tr>
<tr>
<td>Physics</td>
<td>62.0%</td>
<td>47.4%</td>
<td>44.6%</td>
<td>57.3%</td>
<td>31.9%</td>
<td>43.7%</td>
<td>50.2%</td>
<td>33.9%</td>
</tr>
<tr>
<td>Foreign-born</td>
<td>26.0%</td>
<td>57.8%</td>
<td>0.9%</td>
<td>13.3%</td>
<td>4.7%</td>
<td>5.1%</td>
<td>42.8%</td>
<td>42.1%</td>
</tr>
<tr>
<td>Total Number of Respondents</td>
<td>779</td>
<td>326</td>
<td>1,547</td>
<td>1,411</td>
<td>892</td>
<td>684</td>
<td>1,531</td>
<td>1,989</td>
</tr>
</tbody>
</table>

All data are weighted. Values exclude members of the Indian Academy of Sciences (India) and Fellows of the Royal Society (United Kingdom).


Religion is not only different across national and regional contexts but also varies along several other dimensions. Gender, for example, is thought to drive religious commitment because women are more religious than men. As disciplines that offer an explanation of the origins of humans and the universe, biology and physics similarly exhibit unique intersections with religious belief. The RASIC survey is designed to capture demographic differences important to understanding the science-faith interface, including gender, career stage, discipline, and immigration.

---

³All tables included in this report were created by Bob Thomson.

³Percentages do not add up to 100 due to nonresponse.
A strong majority of scientists in India, Turkey, Italy, and Taiwan are affiliated with a religious tradition. Seventy-nine percent of Indian scientists are Hindu, 73 percent of Turkish scientists are Muslim, and 56 percent of Italian scientists are Roman Catholic, while religious scientists in Taiwan are split between Buddhism, folk beliefs, Protestantism, and other faith traditions. A slight majority of scientists in the United States (57 percent) have no religious affiliation, but there is nonetheless a strong contingent of Judeo-Christian affiliates, as well as affiliates of minority religions. In the United Kingdom, more scientists are Christian than in the U.S., but fewer represent minority religions. Among the religiously affiliated scientists in Hong Kong, Protestants and Buddhists are the largest groups. Catholics constitute the largest religious group among scientists in France. The table below depicts the proportion of scientists who believe in God or a god in each regional context.

Based on weighted data, excluding nonresponse. Agnosticism is defined as not knowing whether there is a God and believing there isn’t any way to find out. Data also excludes Fellows of the Royal Society (UK) and members of the Indian Academy of Sciences (India).

• Belief in a Higher Power is especially high among scientists in Turkey, India and Taiwan. (The category “at least some belief in a Higher Power” combines several groups, including those with and without doubt about the existence of God, those who believe in one or many gods, and belief in a Higher Power.)
• A majority of scientists in Turkey, India, Taiwan, Italy, and Hong Kong believe in one God, many gods, or a Higher Power.
• Only in France do a majority of scientists identify as atheist.
• Agnosticism among scientists is highest in the U.S. at 29 percent, followed by the U.K. at 25 percent.

RELGIOUS AND SPIRITUAL SELF-IDENTIFICATION OF SCIENTISTS

Based on weighted data, excluding nonresponse. Data also excludes Fellows of the Royal Society (UK) and members of the Indian Academy of Sciences (India).

• A majority of scientists consider themselves either religious or spiritual, or both, in all regions except the U.S., U.K., and France.
• More than 50 percent of scientists in the U.S., U.K., and France consider themselves neither religious nor spiritual, with French scientists scoring highest on this measure.
• India and Turkey show the highest prevalence of scientists who consider themselves “religious, but not spiritual.” Follow-up interviews revealed that discourse surrounding the term “spirituality” is less elaborate and not always tied to religion among scientists in India and Turkey, relative to other regional contexts. Taiwan is the only country in which the most common identification among scientists was “spiritual, but not religious.”
RELIGIOUS PRACTICES

RELIGIOUS SERVICE ATTENDANCE AMONG SCIENTISTS

- In Turkey, Italy, and India, between one in four and one in three scientists attend religious services regularly. Of note: In India, scientists who regularly attend religious services actually outnumber those who never attend—the only country where this trend holds true.
- In most regional contexts, scientists are more likely to never attend religious services than to regularly attend. Lack of attendance, however, is far from ubiquitous, and there are important differences among regions. The majority of scientists in the U.S., U.K., and France are non-attenders; only a small fraction of French scientists attend services once a month or more. In Turkey, India, Italy, Taiwan, and Hong Kong, less than half of scientists are non-attenders.

Based on weighted data, excluding nonresponse. Data also excludes Fellows of the Royal Society (UK) and members of the Indian Academy of Sciences (India).

• Like religious service attendance, the proportion of scientists who pray varies dramatically among regional contexts. Among scientists in France, only one in five prays at all; among scientists in India and Turkey, only one in five never prays. It’s important to stress that the prevalence of prayer in Turkey is due in part to the difference in religious tradition. (Daily prayer is a central part of Islamic practice).
• In India, more than half of all scientists pray every week or more, and in Turkey, two of every five scientists pray several times a day.
• A majority of scientists pray at least occasionally in Turkey, India, Taiwan, and Italy, and 35 percent to 47 percent pray at least occasionally in Hong Kong, the U.S., and the U.K.
• Only in France do less than a quarter of scientists pray at least occasionally.
GENERAL POPULATION COMPARISONS

PERCENTAGE OF SCIENTISTS WITH A RELIGIOUS AFFILIATION COMPARED WITH THE GENERAL POPULATION

Values for scientists are based on weighted data and exclude Fellows of the Royal Society (UK) and members of the Indian Academy of Sciences (India).


• Generally, in each region, scientists are less likely than members of the general public to claim a religious affiliation. The largest divide in religious affiliation between scientists and the general public is in the U.S. (where there is a 27 percent difference), followed by Italy and Taiwan (both with a 25 percent difference), and Turkey (24 percent difference). Scientists in Hong Kong and India were most similar to the general public in this respect, with only a 3 percent separation in each region.
GENERAL POPULATION COMPARISONS

PERCENTAGE OF SCIENTISTS WHO ATTEND RELIGIOUS SERVICES ONCE A MONTH OR MORE COMPARED WITH THE GENERAL POPULATION

Values for scientists are based on weighted data and exclude Fellows of the Royal Society (UK) and members of the Indian Academy of Sciences (India). All values exclude nonresponse.


- In all countries other than Taiwan, scientists report attending religious services less frequently than the general population.
- The greatest difference in religious service attendance between scientists and the general public is in the U.S. (27 percent difference) and Italy (27 percent difference). Scientists in Hong Kong and Taiwan come closest to the general public when it comes to religious service attendance.
As the graph shows, France exhibits the largest proportion of scientists who do not believe in God. Turkey exhibits the smallest proportion of atheists, with only 6 percent of scientists indicating that they are atheists.

Scientists are generally more likely to report being an atheist than are members of the general population, except in Hong Kong and Taiwan. In Hong Kong, members of the general population are nearly twice as likely as scientists to report being an atheist.

The greatest difference between scientists and the general public in terms of belief in God shows up in France (34 percent difference), followed by the U.K. and U.S. (30 percent difference), and Hong Kong (29 percent difference—though in the opposite direction).

Scientists in Turkey, India, and Taiwan came closest to the general population on this measure.
Together, the eight national and regional contexts examined in this study provide a new understanding of how scientists approach religion that could not be revealed by studying any one context alone. We deliberately focused on France, Hong Kong, India, Italy, Taiwan, Turkey, the United Kingdom, and the United States because each country or region exhibits distinctive religious characteristics and contributes a unique perspective on the science-religion relationship.

In the United States—which has a high level of Christian faith as well as religious diversity—we find more conflict between science and religion than in the other countries studied because there is a culture of passive secularism and greater leeway for the display of religion (particularly among evangelicals and Catholics). Some groups of evangelical Christians, in particular, have been vocal in their opposition of human embryonic stem cell research and the teaching of evolution in public schools.4 U.S. scientists are much less religious than the general population, and the difference in religiosity is more pronounced here than in other countries, such as the U.K. and India, leading potentially to more of a conflict framing for the relationship between religion and science.

Scientists in the United Kingdom and France worry, in particular, that a recent influx of Muslim immigrants may pose unique faith-based challenges to science.5 In France, we found an assertive secularism with low levels of religious identification in the general population and among scientists, minimizing the opportunity for conflict between science and religion to arise. For the most part, no one really knows or even cares who is religious, but problems seem to arise when Muslim scientists bring overt religious practices into science. In England, there is an established state church and low levels of religious participation among the populace that normalizes religious expression to some extent. In the U.K. more broadly, U.K. scientists have many examples of working with scientists who are religious. Yet here, too, Muslim immigrants have brought a more serious level of religiosity to the region as a whole and the scientific community in particular, thereby increasing the level of conflict between science and religion for U.K. scientists. Scientists in Turkey are also concerned about the impact of Islam on their developing science infrastructures.

In India, we find most scientists are Hindu, and in Italy, most scientists are, at least nominally, Catholic. The relationship between science and religion in Taiwan and Hong Kong, smaller states that were formerly colonies of both Asian and Western powers, is
more complex. High-quality private schools established by Christians decades ago are ubiquitous, and there is a strong presence of Christian, Buddhist, and Muslim associations on university campuses. Here the conflict is mainly between those who want to jettison the religious colonial legacy altogether and those who see their religious identity as a distinctly local, and therefore politically valuable, mixture of traditional Western and Chinese cultural beliefs and world-views. Even a secular scientist in Hong Kong or Taiwan might feel compelled to observe Buddhist rituals or Christian holidays in order to maintain ties to a religious family history.


OVERVIEW OF STUDY OUTPUTS AND OUTCOMES

Our work will make an important and significant contribution to the literature on the interface between science and religion. Five academic articles have been submitted for review, and many more are in development. Three books communicating findings from the project data are being written. Moral Orders of Science (working title) will provide the first ever multidimensional and global perspective on what it means to be a “good” scientist, and Science and Secularization Around the World: Religion Among Scientists in International Context (working title) will provide key insights from each region and nation in the RASIC study and examine how scientists within each context view religion. Another book will examine gender and family life among scientists in each region.

Our work on this study is also facilitating the development of a new subfield within the social sciences—the social scientific study of science and religion—and we are pleased to already see a number of scholars building off the work we have started. By the end of 2017, we will release a publicly accessible dataset of project data, which will allow scholars to further expand the study of science and religion and pursue new lines of inquiry and research interests in this area. In addition to this conference, we have hosted a conference in the U.K. and have presented project data to scholars and members of the public totaling 29 events, with many more lectures planned for the years ahead. At these events, we foster an atmosphere where attendees feel free to engage in conversation with us and each other, stimulating constructive dialogue on the science-religion relationship.

One study impact that we are particularly proud of is the numerous opportunities the RASIC project has afforded for the mentorship of junior scholars in research methods and the study of science and religion. More than 100 scholars have contributed to this research, including undergraduate students, postdoctoral fellows, subcontractors, and research staff members from varied backgrounds. This study has been an exciting collaborative process and an important tool for the professional and academic development of all involved.
For more information about the RASIC study or the Religion and Public Life Program, contact Hayley Hemstreet at hjh2@rice.edu or 713-348-3974.