SCIENCE–RELIGION BOUNDARIES IN INDIAN SCIENTIFIC WORKPLACES

by Simranjit Khalsa, Brenton Kalinowski, Brandon Vaidyanathan, and Elaine Howard Ecklund

Abstract. Recent social scientific studies have focused on the different ways in which scientists conceive of the relationship between science and religion, conflict, complementary, independent, or some other understanding. However, there is still much less research on scientists' religious lives outside the United States and the United Kingdom. Drawing on data from participant observation, in-depth interviews (N = 80) and nationally representative surveys (N = 1,763) with physicists and biologists in India, we begin to address this gap. We find that even though the majority of scientists report the independence view through our survey, when interviewed they say that religion and scientific work overlap considerably and in distinctive ways from the United States and the United Kingdom. Specifically, Indian scientific institutions (1) seek religious authorization, (2) offer religious accommodation to staff and students, and (3) facilitate selective integration of religion into the workplace. Our article shows how, in spite of scientists' espoused preferences for non-overlapping magisteria and attempts to construct boundaries between religion and science, religion overlaps with science in scientific workplaces.

Keywords: Stephen Jay Gould; India; scientists; workplace

Introduction

Paleontologist Stephen J. Gould famously advocated for a view of science and religion as "non-overlapping magisteria" (NOMA)—separate spheres, each with its own delimited scope of authority. Although this independence view of science and religion appeals to many scientists, it obscures

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important ways in which religion intertwines with the realm of science differently in various international contexts, a reality pointed out by recent social science data. Previously, the relationship between science and religion was perceived as one of tension and separate spheres (Weber 1958; White [1896] 2009; Larson and Witham 1997, 1998; Noy and O'Brien 2016). However, many scholars have refined this narrative of separate spheres (Barbour 2000; Collins 2006; Evans and Evans 2008; Evans 2018; Ecklund, Johnson, and Vaidyanathan 2019). Yet, the independence of science and religion is generally seen operating in scientific workplaces.

With notable exceptions (Thomas 2018; Ecklund, Johnson, and Vaidyanathan 2019), the bulk of research on science and religion and on religion in scientific workplaces, however, has been conducted in the United States and the United Kingdom. This leaves a large gap in the literature, as different national contexts have different religious traditions as well as distinct relationships between religion and science, which may not map on to Christian narratives in particular. India is one such place, where religion and science have a long and interconnected history. Here, secularism has a different meaning than it does in the United States and the United Kingdom, and religion influences day to day life—including among scientists—in more pronounced ways than it does in many other contexts (Madan 1987; Gosling 2007; Brooke and Numbers 2011; Brown 2012; Thomas 2017, 2018). In this article, we seek to build on this existing work, by drawing on 80 interviews conducted with Indian scientists to examine how they perceive the relationship between religion and science, and whether religion plays any role in Indian scientific spaces. We find that although these scientists articulate a commitment to the ideal of independence, religious influences consistently emerge in ways that point to a distinct kind of religious pluralism in Indian scientific workplaces.

Science and Religion

The relationship between science and religion has long been characterized as one of conflict (Tschannen 1991; Larson and Witham 1997, 1998). Pointing to the long history of conflict between science and Christian theology (White [1896] 2009), many have argued that scientific institutions lead to the secularization of both individuals and societies (Berger 1967; Weber 1958; Tschannen 1991; Bruce 2002). This body of scholarship proposes that few scientists are religious, and sees science and religion as offering competing explanations for the nature of reality (Stark 1963; Tschannen 1991; Larson and Witham 1998). Some more recent research on scientists finds that scientists in the United Kingdom are strongly opposed to belief in God and life after death, although they do not find a significant relationship regarding their stance on the relationship between religion and science (Stirrat and Cornwall 2013). This polarization between

science and religion has been demonstrated in the public sphere as well, with members of the general public oriented toward science sometimes taking opposing stances on public issues compared to people oriented toward religion (Noy and O'Brien 2016; Ecklund and Scheitle 2017).

However, exceptions to this narrative of conflict are now more commonly noted. Paleontologist Stephen J. Gould famously argued that science and religion represent distinct and important sources of knowledge that address different domains of reality. They thus constitute NOMA: science deals with fact-claims in the natural world while religion deals with the realm of meanings and values, and neither realm has any authority over the other (Gould 1997). Gould argued that these two "magisteria" address different aspects of reality, and that a complete understanding of many questions that have long fascinated us requires insight from both religion and science. Further, one must engage with each on their own terms. Such a perspective does not see religion and science as in conflict, but it nonetheless positions them as separate from each other, each speaking to spheres of the world that the other cannot address, but bumping up against each other at the boundaries between them.

In contrast to scholars who present religion and science as in conflict and argue that the advancement of science contributes to the decline of religion, research on scientists in Western contexts reveals that although scientists are less religious than the general public, religion is not absent among scientists (Ecklund 2010). Nor does the evidence support the notion that science itself necessarily causes a loss of religious belief (Ecklund and Scheitle 2007; Bolger, Thomson and Ecklund 2019). Further, this research shows that the dominant perception of the relationship between religion and science among scientists is one of independence rather than conflict (Catto et al. 2019; Gieryn 1983; Ecklund and Park 2009; Ecklund, Scheitle, and Peifer 2018). Although research on the lives of scientists has demonstrated that scientists are not necessarily irreligious and do not necessarily support the conflict paradigm (Ecklund 2010), it does suggest that scientists in the United States and the United Kingdom rarely bring their faith into the workplace. Such research on religion among scientists, however, remains disconnected from research on the role of religion in the workplace, which suggests more opportunities for overlap between these spheres than a focus on scientists' preferences might indicate.

Religion in the Workplace

Research on religion in the workplace more broadly suggests that religion does emerge in secular workplaces and can shape secular aspects of these workplaces. A growing body of research indicates that religion and work often intersect, with religion providing a source of meaning and ethical guidelines (Day 2005; Steffy 2013; Cadge and Konieczny 2014; Ecklund,

Daniels, and Bolger 2020), challenging the assumed boundary between the sacred and the secular (Lindsay and Smith 2010). The content and form religion takes in the workplace is shaped by the organizational context of the workplace (Grant, O'Neil and Stephens 2004; Lindsay and Smith 2010; Ammerman 2014; Cadge and Konieczny 2014; Sallaz and Cain 2016). Within any particular organization, religious expression may be facilitated in some ways and inhibited in others. For example, Grant, O'Neil, and Stephens (2004) find that within the same hospital, nurses in departments with more patient interaction bring their beliefs about the sacred into the workplace to a greater extent than those in departments with less patient interaction. Further, the actual experience of overlap or separation of religion in the workplace cannot be reduced to the abstract logics of sacred and secular spheres (Di and Ecklund 2017). Given the history of tension between religion and science and the common perception of scientific institutions as secular spaces (Tschannen 1991; Bruce 2002), we thus need to pay more attention to whether and how religion may play a role in scientific workplaces.

Recent studies on scientists have shown that many scientists are in fact religious or spiritual and there is a growing body of work on this subject (Mott 1991; Frankenberry 2008; Ecklund and Long 2011; Ecklund, Johnson, and Vaidyanathan 2019). However, this research has been conducted almost entirely in the west. Research that has been done on scientists in non-western contexts such as Taiwan (e.g., Di and Ecklund 2017) suggests that scientists navigate the relationship of religion and science at multiple levels, maintaining a boundary between religion and science epistemologically but integrating religion in workplace activities deemed nonscientific. These findings suggest that scientists maintain a boundary between the spheres of religion and science by bringing religion into the workplace only when their activities in the workplace can be described as nonscientific. In this way, scientists can maintain commitment to the ideal of NOMA. In India, this boundary is less clear, with scientific spaces being marked by a much higher degree of integration between science and religion (Thomas 2016, 2018).

The Indian Context

India has had a long, intertwined history of science and religion (Nandy 1995; Rao 1996; Subramaniam 2000; Kapila 2010; Brooke and Numbers 2011). Mathematics and astronomy were considerably developed in ancient India and used for religious purposes, such as calculation of auspicious dates or determining a good match for marriage (Raju 2007; Brooke and Numbers 2011). Even in the present day, spiritual movements in India often draw on science to gain legitimacy and attract outsiders (Frøystad 2011). The Hindu right often makes claims that science originated

in a Hindu context and that Hinduism has never conflicted with science, claims that scholars criticize for being historically selective and ideologically motivated (Subramaniam 2000; Nanda 2004, 2010; Brown 2012; Thomas 2018).

Over the centuries, Indian science was influenced by Greek astronomy, Islamic mathematics, and with British colonization, western science (Khan 1989). During the colonial period, science was a means of expanding British control (e.g., through railways, agriculture, and so on) and producing a stable colony, but was also used by Indian nationalists to reimagine their past and envision a modern India (Habib and Raina 1989; Prakash 1999). Famous figures in India who exemplify this trend include Prafulla Chandra Roy, a Bengali chemist who founded Bengal Chemicals & Pharmaceuticals, India's first pharmaceutical company, and wrote a book on the history of "Hindu Chemistry" (Harsha and Nagaraja 2010). During this period, the Indian context was marked by a struggle between adapting to and incorporating western science while also upholding their traditions (Habib and Raina 1989). The influence of such hybridity is evident even in contemporary religious thinking in India about science, such as religious invocations and symbolism in prominent government-led scientific initiatives, such as nuclear testing or the opening ceremonies of new scientific institutes (Prakash 1999). Such hybridity, rare in most western scientific institutions, is quite standard in India (Thomas 2016, 2017).

Conventional understandings of secularism in the west are also quite different from the meaning of secularism in India. In contrast to the French ideal of *laïcité*—the principle of separation of church and state that relegates religion to the private sphere (Maclure and Taylor 2010)—religion in the Indian context is inextricably intertwined with local cultures, making it impossible to erect strict boundaries between the sacred and secular. Although the notion of secularism is enshrined in the Indian constitution, it essentially affirms a positive rather than negative perception of religion—an "equal respect for all religions" rather than a rejection of religion (Madan 1987). In the same vein, Bhargava (1998) describes secularism in India as the state having a "principled distance" from religion. Rather than there being a strict separation of religion and the state, as common in the West, the focus of secularism in India is on equal treatment of all religions or a specifically religiously pluralistic secularism. This framework for thinking about religion in public life would suggest that a strict separation between religion and science may not be expected in Indian scientific workplaces.

However, secularism is also fraught in the Indian context (Rao 1996). On the one hand, the nation's first prime minister upon independence, Jawaharlal Nehru, was an ardent rationalist who believed that science would be a "great liberator from superstition" (Brooke and Numbers 2011, 9). Nehru was certain that with scientific education and

economic development, religious superstitions and problems of religious communalism—strife between ethnoreligious communities, which has a long history in India—would dissolve. Gandhi's view, on the other hand, was that all religions are equal, and that the nation would constitute a collection of religious communities in which religion was integrated into daily life (Madan 1987). In fact, Indian constitutional debates about secularism were marshalled to reinforce the position of primarily middle class, upper caste Hindu men (Tejani 2008). Today, the notion of India as a secular country is often challenged by the Hindu right (Subramaniam 2000; Brown 2012). From its very foundations as a modern nation, the country has thus attempted to chart a course between a commitment to modern, rationalistic, scientific progress and a faithfulness (though, as many would argue, via selective reimagining and reinterpretations) to ancient traditions. This tension between tradition and modernity may have important influences on contemporary Indian scientists.

The caste system, an old and pervasive institution in India, remains a hidden influence in modern scientific institutions (Subramanian 2019; Thomas 2020). Although prestigious scientific institutes espouse a vision of meritocracy, the composition of these institutions is overwhelmingly Brahmin. Historical research documents how during the colonial era, occupations such as engineering that traditionally were seen as the purview of the lower castes were transformed in ways that rendered them fitting for upper castes (Subramanian 2019). Upper castes, who enjoyed the material benefits of the caste system, were quick to embrace claims of being post-caste. Meanwhile, nonelites needed to claim their caste status to mobilize and secure equal rights. Quotas were introduced for lower castes who were historically denied educational opportunities. This has led to a peculiar paradox: upper caste scientists and technology professionals claim, on the one hand, that caste has no bearing on their accomplishments, which are purely a result of individual merit, and on the other hand, that only Brahmins are naturally suited to scientific occupations (Sur 2011; Thomas 2020).

A further critical difference between western and Indian contexts is the absence of key polarizing issues. Notably, Darwinian evolutionary theory has not been publicly perceived as a threat to religion in India, where religious life is predominantly conceived of as a matter of inner spiritual development, unrelated to the physical evolution of species (Brooke and Numbers 2011; but see Brown 2012 on Darwin's ambiguous reception among Indian intellectuals). Recently, there have been notable exceptions with the Minister of Education publicly rejecting evolution and claiming that "Darwin's theory is scientifically wrong" (Safi 2018). The official's statement was rejected by his superior after protests from scientists. In fact, in the Indian context, it is common for people to use science to provide religion with legitimacy (Prakash 1997; Kapila 2010; Frøystad 2011;

Subramaniam 2019; Nanda 2020). The modernization of India and the increasing authority of science was framed as a return to ancient science of India rooted in the Vedas (Prakash 1997; Nanda 2020) and in India today new age Hindu movements draw on science in a variety of ways, for example, claiming that scientific discoveries were first made by Hindus or using the terms of science to describe religious or spiritual practices to outsiders (Frøystad 2011). Such claims are leveraged as a source of legitimacy for the project of Hindu nationalism (Subramaniam 2019; Nanda 2020). Finally, an important difference between India and the United States and the United Kingdom is that the advance of modern scientific and technological training in India seems to have had little influence overall on the pervasiveness and importance of traditional forms of worship. The World Values Survey over the past two decades shows consistently high levels of religious belief and practice in India. In this context, ethnographers who have studied scientists have shown that even atheist scientists are often active in religious practices and tend to consider themselves part of religious traditions (Thomas 2016, 2017). Further, Renny Thomas (2018) argues that researchers need to move beyond understanding views on religion and science dichotomously as being either conflicting or complementary. Our work takes up this same idea from a mixed-methods approach looking at a broad set of Indian scientists who represent all fields of biology and physics.

In sum, while the independence view of science and religion appeals to many scientists who do not see science and religion as necessarily conflicting, it is necessary to examine the social contexts of the science and religion relationship. Current research suggests that scientists take an independence view of the relationship between religion and science, and that religion is largely kept separate from scientific workplaces. But it is necessary to look beyond the Western context and to examine what role religion might play in scientific workplaces in countries such as India, where religion is more deeply intertwined into the social fabric and where the dominant religious tradition is not Christianity. To address these gaps in the literature, we ask three questions: First, how (if at all) does religion emerge in the Indian scientific workplace? Second, to what extent is the separate spheres/NOMA view characteristic of this context? Finally, in what ways do Indian scientists draw boundaries between religion and science?

Methods

This study draws on data from a mixed-methods international research project on religion among physicists and biologists in eight different regions: India, Turkey, Taiwan, Hong Kong, Italy, France, the United States, and the United Kingdom. Each of these regions are marked by very different relationships between religious and state institutions, different levels

of science infrastructure ranging from still-developing to long-established scientific communities, and distinctive cultural and religious dynamics that may influence the relationship of religion and science. We made the choice to focus on physicists and biologists for several reasons. These two disciplines are considered classic among the natural sciences, and it is common for philosophers and sociologists of science to describe these two disciplines as carrying the most prestige in popular perceptions of scientific authority. Another strength of focusing on these disciplines is that there was greater consistency from one department to the next in physics and biology, when compared to some other scientific disciplines, which was beneficial for the comparative approach of our study. Finally, physics and biology often overlap with religion in the type of big-picture questions they address such as the origin of the universe and human evolution.

In the first stage of data collection, we compiled a sampling frame of universities and research institutions with physicists or biologists in each of the regions studied using Web of Science (WOS), compiling a list of author affiliations from a sample of published articles listed on WOS from 2001 to 2011. From this list of organizations, we stratified this list by elite and nonelite organizations and then selected 662 elite and nonelite biology and physics organizations. We then constructed a sampling frame of physicists and biologists in these organizations using departmental websites, stratified by rank and gender. We organized scientists by rank using three categories: scientists in training, junior scientists, and advanced scientists. From this sampling frame, we surveyed over 22,000 physicists and biologists at various career stages from both elite and nonelite universities and research institutes. Our survey respondents were asked if they would be willing to participate in an interview, and after completing the survey, 609 interview respondents were selected from this pool using stratified random sampling. This study was the first large-scale, mixed-methods study of religion and science among scientists and our mixed-methods approach provides us with comprehensive data on important questions in this area.[1] For further details on the methodology, please see Ecklund, Johnson, and Vaidyanathan (2019).

This article focuses on the Indian context and draws on surveys and interviews conducted with scientists in India. A total of 1,763 Indian physicists and biologists participated in our survey, yielding a response rate of 44 percent. To further explore survey themes, we conducted follow-up interviews with a total of 80 Indian scientists, 68 (85 percent) of which were conducted during two separate trips to India, six by telephone (7.5 percent), and six by Skype (7.5 percent). Our sample of Indian scientists included 45 biologists (56.25 percent) and 35 physicists (43.75 percent). Of these respondents, 19 were women (23.75 percent) and 61 were men (76.25). Religiously, 41 were Hindu (51.25 percent), nine were Muslim (11.25 percent), five were Sikh (6.25 percent), six belonged to another

religion such as Christianity, Jainism, or Buddhism (7.5 percent), and 19 report not being religious or not belonging to a specific religion (23.75 percent).[2] Interview participants were chosen based on their responses to questions about religion (which allowed us to categorize them as not religious, slightly religious, and very religious) as well as gender, discipline, and rank. The interviews dealt with a range of subjects from personal views on religion and spirituality, the role of religion and spirituality in respondents' work, their views on workplace ethics, and work-family dynamics. For the purposes of this article, we focus on subsections of the interviews dealing with their views on the relationship between religion and science and the role of religion and spirituality in the workplace, particularly in relation to research, teaching, and interactions with colleagues.

We draw on our survey data to present a descriptive breakdown of Indian scientists' approach to the relationship of religion and science; however, the bulk of our analysis focuses on qualitative data comprising 80 in-depth interviews conducted with Indian scientists, as well as field-notes from site visits.

Results

On the Relationship Between Religion and Science

First, we turn to our respondents' views on the relationship of religion and science. Survey respondents were asked their view of the relationship between science and religion ("For me personally, my understanding of science and religion can be described as a relationship of…") by choosing one of six answer categories: "conflict, I consider myself to be on the side of science," "conflict, I consider myself to be on the side of religion," "conflict, I am unsure which side I am on," "collaboration, each can be used to help support the other," "independence, they refer to different aspects of reality," and "don't know." Here, consistent with Gould's (1997) arguments, we found the dominant perspective among Indian scientists is the independence view. As Table 1 shows, 44 percent of scientists saw the relationship of religion and science as one of independence, just under 27 percent saw it as a relationship of collaboration, and 19 percent believed that religion and science were in conflict and took the side of science.

Our qualitative data closely match our survey responses and reveal this trend toward a perspective of independence as well, with the greatest number of our respondents articulating a belief in the independence of religion and science at 41 percent. For example, a female assistant professor in biology[3] said: "Religion is a separate thing. I think almost every student on the campus or wherever I've seen in India understands that." This clearly demonstrates that the narrative of independence/separation is the dominant one. However, we find that despite these articulated beliefs about the

Table 1. Indian scientists' views on the relationship of religion and science

Relationship of science and religion	Indian scientists survey (%)(N) 1,763	Indian scientists interview (%)(N) 80
Conflict, I am on the side of religion	1	0
Conflict, I am on the side of science	19	20
Conflict, I am unsure which side I am on	1	3
Independence, they refer to different aspects of reality	44	41
Collaboration, each can be used to help support the other	27	28
Do not know	8	9

Notes: All survey data were weighted. Values exclude nonresponse. Not all percentages add up to 100 due to rounding.
Data: RASIC India Survey and Interviews 2014.

relationship of religion and science, our respondents' narratives are marked by the consistent emergence of religion in scientific spaces. We identify three themes in the emergence of religion in Indian scientific workplace: institutional authorization of religion in scientific spaces, accommodation of religious practices among scientists, and selective integration of religion within the spheres of science. Finally, we find that the presence of religion in scientific spaces is not without conflict, as evident in attempts to construct boundaries between religious and scientific spaces.

Institutional Authorization

When asked about the emergence of religion and science in the scientific workplace, our Indian scientists' narratives were marked by stories of instances in which religious symbols and practices were accepted and supported by scientific institutions. Scientists noted the presence of religion at major scientific conferences. For example, an assistant professor of physics[4] said:

> the first thing that happened in the conference … was an invocation of this goddess and then there was this song and hymn that was sung in praise of this goddess, Goddess Saraswati [the goddess of wisdom]. And then the rest of the scientific program commenced. So once the science started, there wasn't any other mention of religion. And this was not really a very uncommon thing….

This quote reveals the ways in which religious rituals and symbols are brought into scientific spaces, authorized at an institutional level.

As is common in the launching of new undertakings in many Indian organizations, the conference began with a religious ritual to honor the Hindu goddess of knowledge. When such institutionally sanctioned practices do occur, they are most often affiliated with Hinduism unless they are taking place at an institution formally affiliated with another religious tradition. Although our respondents' narratives reveal the presence of institutionally sanctioned religious practice, this quote demonstrates that this incorporation of religion is not assumed to be natural. Some of our respondents brought up the recent controversy about the launch of an Indian rocket. Before the launch, the Chairman of the Indian Space Research Intervention, K. Radakrishnan, offered a special *puja* (prayer) to mark the occasion and was heavily criticized by Indian rationalist organizations. In spite of this practice being common, many scientists are highly critical of this formally approved intrusion of religion into the scientific sphere.

In contrast to the top-down mode of institutional authorization of religion in scientific spaces discussed above, a second, more bottom-up mode of authorization on scientific campuses occurs through religious festivals. Previous research has revealed scientists' participation in religious celebrations at Indian universities (Thomas 2016) and our findings confirm this. Most Indian scientists we spoke to emphasized the secular functions of these events, insisting that these should be seen as celebrations of culture rather than religion, as well as opportunities to enjoy special ethnic foods and engage in social networking. In the Indian context, religion is closely tied to ethnicity and culture, and this link is often a reason why even nonreligious faculty are found organizing such religious events. For instance, the Durga Puja is a major religious celebration for the Bengali community, and since Bengalis tend to be overrepresented in the Indian scientific community, most major scientific institutions around the country hold celebrations of this event.

A graduate student in physics[5] explains the social nature of such celebrations: "A lot of religious festivals are not just because of the religion … they are essentially social festivals. Things like Diwali, for example; you'll find if you walk into [my institute] the canteen is probably decked up. … But it's got no sense of the religion. It's more of a social thing and a celebration." Respondents thus believe it is common for religious festivals to be celebrated on university campuses and for everyone (staff, students, researchers, and so on) to attend and participate. In this way, although people may not view themselves as religious, they nonetheless commonly celebrate religious holidays. Another respondent illustrates this saying:

> IND01: there are instances where students celebrate certain festivals on campus, and most of them are Hindu festivals, because Hindus are the majority….
> Interviewer: So I mean, it's taken for granted that you celebrate Holi or Diwali [Hindu festivals]… but you don't talk about religion necessarily?

IND01: Yeah, as such yeah. It's more of a celebration than anything.

In this way, this respondent emphasizes that such practices, which include Hindu religious ceremonies, are cultural rather than religious practices. This is similar to findings by Thomas and Geraci (2018) in their ethnography of the *Ayudha Puja*. Some of their respondents saw the festival as a cultural practice rather than a religious one, despite its history as a religious ceremony and its clear reference to Hindu concepts. However, Thomas and Geraci argue that there are complications in defining religion and applying it as a distinct concept in opposition to culture; the meanings of these terms can vary from context to context. Our respondent's understanding of Holi or Diwali as being cultural rather than religious is an indication that religious practice may be seen as more cultural by some scientists, especially when they enter spaces such as a university campus.

Accommodating Religion

The emergence of religion was not isolated to the institutional sphere. A second theme that emerged in our respondent's narratives was accommodation of religious beliefs and practices; Indian scientists articulated great concern for the beliefs of others. This concern for the ability of others to practice their faith is tied to and supported by notions of secularism in the Indian context at a national level, where to be secular is taken to mean that all religions are respected and treated equally in public spaces, rather than the relegation of religion to the private sphere. The religious practices of scientists are supported even when they can become highly inconvenient in the scientific sphere. For instance, a physics professor[6] (who is not himself Hindu) chose dates for submission of assignments according to what may be most auspicious according to the perspective of his Hindu students. He made these changes to the running of the scientific sphere in order to respect their religious preferences: "[T]hey say ok, why don't we submit on the 22nd? 9 o'clock is a good time according to Hindu stars and all. Then I said OK, you have time…. [A]ccording to Hindu philosophy, some days, some stars are really good…. So that way, religion is coming [into the workplace]." Our respondents' narratives thus reveal a high degree of respect for and accommodation of religious practices that is rare in contexts outside of India.

Some respondents also subscribe to the Guru-Shishya relationship, an ancient cultural ideal that governs the relationship between master and disciple. In this model, the teacher adopts a very familiar relationship with the student, akin to being a second parent, and the student in return shows the teacher great deference. Some scientists framed their relationship with their students in these terms. For example, the same physics professor quoted above[7] said:

> There is a guru and student relation. It's more like a family. More than a son and father." [Talking about a Muslim PhD student:] "It is very difficult to understand their emotions and their [prayer] times. … I am familiar with Christians and I am very much familiar with Hinduism. … But I don't have too many Muslims with me… he is [like my] adopted … son…I had the books [the Quran and other books about Islamic teaching] and whenever I got time, I am reading those things. … I had to respect his thing…[And now] I think I know Islam more or less now.

This example demonstrates how practices central to the pursuit of the sacred in the Indian context can influence the scientific sphere, with some cases of the relationship between student and advisor taking on this form. When this did emerge among our respondents, it was between male students and male advisors.

Scientists also describe participating in religious practices, despite not being religious themselves, in order to demonstrate respect and appreciation for workers who support their scientific research. An associate professor of physics[8] reveals this, saying:

> Vishwakarma is the mechanic god. So [the technicians and engineers] celebrate Vishwakarma in a reasonably big way.… They invite me to come there to take … what is called prasad.… And, so, I once in a while attend that. Because there are many of the machinists whose services I use, and I'm very fond of them, because they are very good machinists.

Similar to respondents who describe participating in religious festivals because they are social events, other respondents point to secular reasons for their involvement in religious practices, such as to curry favor with university staff they rely upon to keep their machines functional and allow them to conduct their experiments smoothly. Further, not only do these nonreligious scientists go beyond simply accepting the religious practices of others in scientific spaces, they make a point of participating in these activities and making an effort to learn more about the religious traditions of their staff and students. This marks a divergence from the form of religious accommodation in the west.

Selective Integration

In addition to accommodating the religious practices of others, our respondents' narratives reveal ways they integrate religion in scientific workplaces in their day-to-day lives. In the Indian context, religion is marked by great diversity, and the country's history is marked by conflict between various religious groups. Thus, a common response to the pervasiveness of religion, both in terms of personal religiosity of scientists and the presence of religious rituals and symbols in scientific spaces, is for respondents to avoid the subject of religion in interaction with their colleagues in order to avoid conflict and to ensure no member of any religion feels marginalized.

However, this is not to say religion is absent from conversation in scientific workplaces. For example, a biology PhD student[9] said:

> especially in India where there's Hindus and Muslims or within the different sects of Hinduism, some people follow… some other type of religion. So people tend to avoid it as much as possible … But once you know that this person belongs to your sect, then they talk all the time about religion, that's all they talk about.

Thus, many of our respondents saw religion as a subject to be avoided. However, this was not tied to some notion of the workplace as a space that should be free of religion; rather it was due to the religious diversity of the Indian context. Further, when it becomes clear that people share a religious background, the topic of religion is no longer avoided and in fact people are often eager to discuss religion, both in the workplace and outside of it.

The integration of religion and science is also marked by the presence of religious symbols and religious practices in scientific workspaces. It is common for individual scientists to observe and participate in religious practices in their offices and labs. One example of this is praying for the success of their scientific endeavors. A research scientist in biology[10] said: "one of my earlier bosses who used to have Ganesha's idol in front of him, and whenever he enters his lab he used to, you know, touch his feet and then start working. … Their work, their conversations, never gives you this idea. But definitely … when you, when you closely follow them you come to know that they are a bit spiritual." This form of integration of religion in scientific spaces is pervasive in scientific spaces in India.

Other nonreligious scientists generally accept this practice, and they certainly do not believe that such religious symbols or practices affect the type of research produced by religious scientists. The visibility of these practices in scientific spheres is taken for granted. In some cases, senior scientists even encourage their students to participate. For example, a biologist,[11] herself nonreligious, said: "When we don't get results, we pray a lot … I tell my students to go to any place, place and pray properly so that our experiment will work (both laugh)." Some scientists who observed these practices in religious spheres described them as a placebo effect. A biology PhD student[12] said of religious scientists: "of course, they're religious and spiritual as well, so they have some Puja and before they do it—before they want to accomplish any work they will do that Puja and then do as well, it's basically kind of a placebo effect that, 'Okay, if I do this, then I will be able to achieve those things.'" Thus, nonreligious scientists observe such religious practices in the workplace and, for the most part, tolerate them with attitudes ranging from acceptance to mild condescension.

These quotes reveal that scientists who are religious draw on their religious belief to support scientific practices and that these are observed and

generally accepted by their nonreligious colleagues. Scientists may pray for the success of their research; students' advisors may (half-jokingly) encourage them to seek religious recourse; and colleagues avoid commenting on religion or religious practices to ensure that all are made welcome in the scientific workspace. However, there are some scientists for whom this integration of religion and science is viewed with skepticism, with some among them taking pains to make sharp distinctions between religion and science.

Contested Boundaries

Within the scientific sphere, at an institutional level and in individual interactions, some scientists seek to defend the sphere of science from religion. People in positions of authority (i.e., the chairperson of a department or institute) may take issue with institutionalized expressions of religion and limit or prohibit them. A biology PhD student[13] spoke to us of a leader in their department prohibiting the celebration of a religious festival in the institute, saying:

> it's happened in our department where the library staff used to celebrate one of these festivals, I don't remember which one. They sort of worship famous books or whatever, and they celebrate them, there's lunch and stuff. But the chairperson had an issue with that. They didn't want religious celebration in the institute.

In this way, people in authority in scientific institutions in India may try to limit religious expression in scientific spaces and thus construct a boundary between religion and science. In other instances, tension may emerge between scientists and university staff. This became apparent during a visit to one of the universities in our sample, where a physics professor[14] took us to see a termite hill that was a sacred space for some members of the university staff as well as a subject of study for geologists at the university. These groups clashed over control of this space: the incense sticks used by devotees would chase away the termites that the researchers were trying to observe. According to the respondent, the scientists ultimately gave up on this particular termite hill. He said: "I think in that particular case the ecologists lost … So they gave up and they went away [laughs]." He explained this clash by claiming that scientific worldviews had not spread to the general public in India. In making this argument, the respondent draws a clear boundary between scientists and the religious practices of the general public.

In other cases, individual scientists articulated criticisms of religion by describing ways they believe it conflicts with scientific pursuits. For instance, a research fellow in biology[15] criticized the passivity of students encouraged by the traditional Guru-Shishya relationship: "Religion teaches people to accept things without asking… And that becomes a serious

problem in understanding science. And I experience it in my classroom that … whatever I say to students is a statement that is like an order. They will just accept it." This demonstrates that, where scientists do express concern about religion and religious practices, their concerns are articulated by drawing on a central tenet of science: inquiry. These scientists believe that religious belief discourages individual curiosity and limits the drive for inquiry, and criticize this encroachment of religion on science. Thus, although we find religion and science are deeply interconnected for many of our respondents in the Indian context, there are some Indian scientists we interviewed who argue for religion and science being separate and challenge the connection between them.

Discussion and Conclusion

We find that, in the Indian context, religion permeates established scientific institutions, despite our respondents' articulation of the view that religion and science are independent. We find that religious symbols are present in the workplace, for example, in the form of idols decorating office spaces and research labs. In addition, many Indian scientists perform religious practices in their workplace or in order to support their scientific pursuits. These practices are accommodated by religious and nonreligious scientists alike. However, despite the integration of religion and science in the Indian scientific workplace, the boundaries between them are contested at an institutional level and by individual scientists. In some cases, these scientists articulate strong criticisms of religion, viewing it as detrimental to scientific pursuits.

Consistent with research on scientists in the Western world (Gould 1997; Ecklund and Park 2009; Ecklund, Park, and Sorrell 2011), we find that the narrative of conflict is only articulated by a minority of Indian scientists. Some Indian scientists described people in positions of authority limiting religious practices in university spaces and presented religion and science as conflicting ways of knowing (Tschannen 1991) but this is not the dominant pattern among our respondents. In fact, most Indian scientists profess the NOMA ideal. On the surface, this seems to suggest support for the prevalence of independence of science and religion across the globe. Yet, in spite of scientists' articulated preferences, religion is pervasive in the Indian scientific workplace. Looking at science and religion as discursive/epistemological "magisteria" neglects these modes of overlap. Studying the Indian scientific workplace reveals the incongruence between articulated narratives and day-to-day life and illustrates the need for a shift in our understanding of religion and science (Thomas 2016).

Our findings reveal that religion is pervasive in the Indian scientific workplace. Religious festivals and celebrations are a prominent form of such influence. In such events even scientists who are nonreligious, or

who are not a part of the same religion, nonetheless often participate in and support such events, often describing them as being primarily cultural or social, rather than religious as such. Although some scholars present science as a secularizing force (Tschannen 1991; Bruce 2002), consistent with findings by Thomas (2017), and Thomas and Geraci (2018), we find evidence that religion continues to emerge in what is commonly perceived as a secular space. In fact, some Indian scientists see religion as a support for their scientific work. This aligns with the growing body of literature on the important role of religion in the workplace (Day 2005; Steffy 2013; Cadge and Konieczny 2014), including scientific workplaces. We find that the presence of religion in Indian scientific workplaces is supported through top-down and bottom-up processes of institutional authorization and accommodation of individual religious practices.

Other research on scientists in non-western contexts has also shown the presence of religion in scientific spaces. Research on Taiwan scientists shows that while these scientists uphold boundaries between religion and science, boundaries between religion and activity that is perceived as nonscientific are more permeable (Di and Ecklund 2017). For these scientists, when religion does come up in scientific workplaces, they generally perceive the setting as nonscientific. For example, these scientists say that they will discuss religion with their colleagues but not in a conversation about science. We focus instead on religious activities of Indian scientists and find that they commonly engage in religious practices in scientific settings, framing their engagement in religious practices as in support of their scientific work or describing their participation in religious practices as nonreligious. They participate in religious festivals and practices for cultural or social reasons, but nonetheless, religion remains an important fixture in their work lives. Thus, Indian scientific institutions are marked by a selective integration of religion into the scientific workplace. Some readers may wonder why scientists committed to rationalism in the lab may not only espouse "irrational" religion in their private labs but allow it to encroach into their workplaces as well. The answer is likely that scientific and religious socialization happen in different contexts and institutions. Although in the West such socialization has included a history of mutual antagonism, this is not the case in India, where the boundaries between science and religion even in the workplace seem to be porous. Note that one might ask the same question of religious individuals: why are not their lives, across all the social contexts they inhabit, congruent with their professed beliefs and ideals? For human beings, however, incoherence is the norm, and congruence—whether religious or scientific—is the exception (see Chaves 2010).

Future research on religion in the workplace would benefit from reconceptualizing the forms religion may take in the workplace and examine instances where religious meaning is not attached to religious practices

in the workplace. Focusing solely on religious belief leaves a gap in our understanding of the way religion intersects with the workplace. Rather, we argue that research on religion in the workplace would benefit from shifting away from a belief-centric view of religion toward a conceptualization of religion focusing on practice and lived religion. This approach to religion is consistent with recent theoretical injunctions in the sociology of religion pointing to the importance of religious practice and decentering belief as the core feature of religion (Riesebrodt 2010; Ammerman 2014; Smith 2017). Additionally, further studies would benefit from an examination of the variation within this population regarding difference among scientific discipline and type of organization (Ecklund, Scheitle, and Peifer 2018), gender, and organizational rank. Further, a limitation of the present study was that it did not ask scientists questions about caste, but the religious beliefs and practices articulated by most respondents suggests our sample was largely Hindu Brahmin. Future research on Indian scientists should pay more attention to the role of caste.

This shift of focus toward religious practice becomes all the more important when looking at nonwestern contexts and religions marked by different familial and cultural expectations. We need to view scientists as socially embedded in particular familial and cultural contexts. Family settings are a core setting for religious practice in India, and families hold great sway over the religious practices of their members (Min 2011). Thus, it is likely that religion plays a more prominent role in workplaces and family lives in contexts like India. Nevertheless, there are important forms of boundary-work individuals engage in when managing their work and family life (Nippert-Eng 1996; Blair-Loy 2003). Future research should examine how these forms of boundary work intersect with religion, particularly in contexts where religion, family, and the workplace are so closely intertwined.

Our examination of the Indian context shows that the forms of overlap between religion and science are shaped by national and local forms of religion, where idols are common, festivals are central to religious practice, and Hinduism is the dominant religious expression. Although some of our respondents discussed a conflict between religion and science, these conflicts were not centered on particular polarizing issues such as evolution (Brooke and Numbers 2011). Further, Indian scientists make strong and consistent efforts to accommodate religious practice in the workplace, aligning with the Indian notion of secularism that places value on equal respect for religion rather than the absence of religion from public spaces (Madan 1987). This is a degree of religious accommodation is not seen in Western science, moving beyond tolerating religious practice to encouraging and embracing it. This relationship is not an example of accommodation, nor does it fit into the category of independence in the sense of separate spheres. For this reason, we recommend that future studies look

beyond conflict, independence, and collaboration to an additional category of commensality or coexistence of religion in scientific workplaces, where the two coexist in the same space without complementing each other or coming into conflict.

Our study also affirms the importance of the broader national context in shaping the role of religion in the workplace. As it continues to be common for Indian scientists to work and be educated abroad, this may have some impact on religious expression in scientific spaces and how it is understood by Indian scientists (as religious, as cultural, as a danger to scientific inquiry). Further, the influence of education abroad may facilitate the adoption of the independence narrative, the salience of issues such as evolution, and reframing the presence of religion in science in secular terms.

Although the notion of NOMA may be articulated by Indian scientists as the ideal relationship between science and religion, our findings thus reveal that this narrative does not capture the complex relationship of religion and science in the Indian scientific workplace, where we see the possibility of overlapping magisteria.

Notes

1. C. Mackenzie Brown (2012) conducted a notable quantitative study of Hindu views on topics such as evolution.
2. Because of the way we constructed our random sample, the majority of our respondents are Hindu, which reflects the broader population of India, but also is emblematic of the way science in India is dominated by those of the Brahmin caste and opportunities in science are less open to those of other backgrounds (Subramanian 2019; Thomas 2020).
3. IND36, female, assistant professor, Hindu, biology
4. IND07, male, assistant professor, no religious affiliation, physics
5. IND59, male, graduate student, Hindu, physics
6. IND37, male, associate professor, Protestant, physics
7. IND37, male, associate professor, Protestant, physics
8. IND56, male, associate professor, Hindu and atheist, physics
9. IND10, male, PhD student, Hindu, biology
10. IND19, male, research scientist, Hindu, biology
11. IND21, female, research scientist, Hindu, biology
12. IND02, female, PhD student, Hindu, biology
13. IND01, female, PhD student, Hindu, biology
14. IND74, male, professor, no religious affiliation, physics
15. IND73, male, research fellow, Sikh, biology

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