

## Diversification and internationalization in the sociological study of science and religion

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# **Diversification and internationalization in the sociological study of science and religion**

Rebecca Catto, Stephen H. Jones, Tom Kaden and Fern Elsdon-Baker

## **Abstract**

American and European classic sociology addressed the relationship between science and religion. However, this interest then waned over the course of the twentieth century, only really returning as an area of sociological interest from the Millennium onwards. More recent sociological research on science and religion focused upon scientists' (ir)religiosity, evolution, and the relationship between knowledge and acceptance of scientific concepts. This research has been mainly conducted in the United States and quantitative and/or focused upon creationism. However, sociologists investigating science and religion have been expanding their research methods and sites. This growing body of diverse work is showing that the "conflict thesis" is not valid, and that publics' and professionals' views on science and religion tend to be fluid and shaped by context. More research from non-Western contexts is required. We also call for more dialogue between sociologists studying science and religion and public understanding of science and science and technology studies scholars to help refine research design. There is scope for greater theoretical development, connecting belief, identity, and culture, and a more intersectional approach would also enable greater consideration of race and inequality in relation to science and religion.

**Keywords:** evolution, culture, belief, epistemology, understanding, publics, conflict thesis, race, inequalities

## **Introduction**

The relationship between science and religion has attracted public interest across Europe and North America for many decades, with that interest having lately increased. The subject has featured prominently in some of the most significant social changes and conflicts of recent times – from the "culture wars" to the rise of "New Atheism" and post-9/11 disputes about the "clash of civilizations" (Hitchens, 2007; Huntington, 1993). Consequently, it has bearing on debates about everything from education to discrimination and immigration. Yet, interaction between science and religion was through the twentieth century mainly the preserve of historians of science (Harrison, 2015; Lightman, 2001; Numbers, 2010), scientists (Gould, 1999),<sup>1</sup> and philosophers and theologians (Barbour, 2013; McGrath & McGrath, 2007). In line with a wider trend within the social sciences since the end of the twentieth century to pay renewed attention to religion (Beck, 2010; Berger, 1999; Casanova, 1994; Habermas, 2010; Micklethwait & Wooldridge, 2009; Roy, 2004), sociologists began to pay more attention to the relationship between science and religion as its role in American domestic, and global, affairs grew increasingly visible. Here, we review

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<sup>1</sup> <https://theconversation.com/religion-isnt-the-enemy-of-science-its-been-inspiring-scientists-for-centuries-90190> (accessed 10:41am 27 August 2018).

current literature and call for an expanded sociological approach to science and religion, building upon the growing body of American work.

The field has grown and changed since Evans and Evans (2008) published their important review of sociological research on science and religion a decade ago. We seek to build upon this review, highlighting more recent work in the sociological study of science and religion and extending the agenda. The present article does this by connecting theoretical and methodological developments in American and European sociology, presentation of the risks of applying survey questions related to science and religion designed in one country to others, and consideration of emerging qualitative and international research. We call for not only more international research within the sociology of science and religion, but also greater engagement with science and technology studies and public understanding of science, as well as the sociology of culture and inequality.

We begin with an overview of recent sociological research into science and religion, focused on scientists' (ir)religiosity, evolution, and the relationship between knowledge and acceptance of scientific concepts. We then consider emerging research in the field. This leads on to highlighting three areas where sociological work can make a unique contribution to debates around science and religion illuminating: 1) the cultural contextualization of "science" and "religion", 2) race and intersectionality; and 3) the limited correspondence between understanding and acceptance of science.

### *Scientific Practice, Secularization, and Institutionalization*

There is a longstanding social scientific tradition of investigating the religious beliefs of practicing scientists. The emergence of this tradition is perhaps partly a reflection of the preoccupation in discussions of science and religion with individual scientists such as Darwin and Galileo. Such figures and the public condemnation they received for their work from powerful clergymen formed the primary focus of Victorian authors, such as John William Draper (2015) and Andrew Dickson White (2009). Draper and White both sought in their writing to shape and promote the notion that science and religion are in a state of perpetual and inevitable conflict: the "conflict thesis" (Hedley Brooke, 1991). Since then, Darwin, Galileo, and other prominent scientific figures' experiences with religious institutions have been carefully studied by historians of science and some myths debunked, e.g. that Galileo was imprisoned and tortured in Rome for advocating Copernicus' theory of the earth's motion.<sup>2</sup> Nevertheless, such popular historical myths, and the "conflict thesis", endure in wider Western culture (see Numbers 2010).

The earliest research into the beliefs of scientists, by the psychologist James Leuba (1934, 2013), in some ways acted as a counterpart to the historical works of Draper and White. Leuba examined levels of religiosity among elite scientists in the United States and reasoned that their relatively low levels of church attendance and belief in God were a result of their high levels of scientific knowledge. This research and analysis set the relationship between science and Christianity up as a zero-sum game: presuming that increased scientific knowledge decreases religiosity.

This type of research – which has almost always focused on the United States – was conducted throughout the twentieth century (Larson & Witham, 1998; Lehman & Shriver, 1968; Stark et al., 1996; Thalheimer, 1973; Wuthnow, 1989). Many of

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<sup>2</sup> Galileo was found guilty of "vehement suspicion of heresy" and subject to house arrest after his 1633 trial regarding his alleged promotion of Copernicus' theory (Finocchiaro, 2009, p. 71).

these surveys found that levels of religiosity were not uniformly low for scientists across all disciplines, with social scientists generally presenting lower levels of religiosity than natural scientists. In Evans and Evans's words, such surveys "subverted the linearity of [Leuba's] model" by highlighting institutional and strategic considerations (Evans & Evans. 2008, p. 93).

Such sociological research focused upon scientists in different disciplines' levels of religiosity. Larson and Witham (1998), like Leuba, took scientists' non-religiousness as evidence for the "conflict thesis": as evidence that science is fundamentally incompatible with religion. However, others who found greater variation in levels of religiosity amongst scientists in different disciplines, such as Stark *et al* (1996), took their findings as evidence that science and religion are not in fact fundamentally epistemologically incompatible. These studies did not address, though, whether scientists themselves see science and religion as incompatible. In the last decade important new research by Ecklund *et al* has started to fill the gap (Ecklund, 2010; Ecklund & Park, 2009; Ecklund, Park, & Sorrell, 2011; Ecklund, Park, & Veliz, 2008; Ecklund & Scheitle, 2007). This quantitative and qualitative research has continued the tradition of examining American scientists' levels of religious belief and practice. It has shown that not only are scientists less religious than the wider American population, but also that religious attrition rates are above average among scientists, suggesting that scientific institutions have a secularizing effect (Ecklund et al., 2008). Interestingly, given earlier debates, in their work with elite scientists, Ecklund and Scheitle (2007) do not find any significant differences in terms of religiosity between natural and social scientists, suggesting either that this difference has diminished over time or that the earlier research was limited. Most significantly, Ecklund *et al*'s work finds that 'the majority of academic scientists [67 per cent], those in the natural and social sciences as well as those who do not practice a religion, perceive there to be no conflict between science and religion' (Ecklund & Park, 2009, p. 76).

Building upon their research in the United States, Ecklund and colleagues recently conducted an international research study concerning scientists' views of the relationship between science and religion. The team conducted a survey of biologists and physicists in elite and non-elite universities and research institutions in France, Hong Kong, India, Italy, Taiwan, Turkey, the UK, and the USA, and then interviewed a sub-sample in each context. Emerging findings indicate that the "conflict thesis" view of science and religion is not held by a majority of scientists across contexts, rather they view them as separate spheres, even in the countries surveyed where participants reported the lowest levels of religiosity: France, the UK, and the United States. Ecklund *et al* (2016) found regional variation and variation across different indicators of religiosity.

In keeping with this emphasis upon the specifics of national contexts, Ecklund and Scheitle (2018) have isolated and analyzed the American survey data from the project, concluding that religious biologists and physicists do report more discrimination based upon their faith identity than non-religious scientists, members of particular religious groups report more discrimination than others, and religiosity appears more stigmatized in biology than physics. Interestingly, though, Scheitle (2011) found, looking longitudinally, that US undergraduates studying natural sciences did not show higher rates of decreased religious belief than others.

Ecklund *et al* note the lack of empirical insights globally to date, "leaving a large gap in our contemporary understanding of science and religion" (Ecklund et al. 2016: 5) and a need for further qualitative research to address religion in the day-to-

day lives of scientists. They add that “A narrow focus on debates related to human embryonic stem cells and the teaching of evolution may therefore be a poor proxy for how scientists themselves think about the science-faith interface and thus, a potential detriment to public perceptions of science among religious communities” (Ecklund et al., 2016, p. 6). This leads directly on to the second area of science and religion research where there has been a substantive sociological contribution to date, again mostly United States-based.

### *Varying Conceptions of “Science”, “Evolution” and “Religion”*

Public debates about the influence of religious traditions on understanding and acceptance of scientific findings have been heavily reliant on a limited selection of polling data, mostly focused upon acceptance of the science of evolution. The most commonly cited is a poll conducted in the USA annually by Gallup since 1982 examining beliefs about human origins (Newport, 2014), which has consistently found that roughly 45 per cent of the American public support the idea that God created humans in their present form at some point in the last 10,000 years. This survey is the source of the often repeated claim (Barooah, 2012; Daily Mail, 2012) that four out of ten US citizens “believes in creationism”. So widely reported have this and similar claims been that a persuasive case can be made that poll-based claims about the prevalence of creationist beliefs in the United States have influenced wider perceptions of what belief in creation, Christianity and God entails not just in the United States but further afield. One poll conducted in the UK for the BBC in 2006, for example, offered respondents three options: “evolution theory” in which God plays no part; “creationism theory” in which God created humans in their current form within the last 10,000 years; and “intelligent design theory” in which features of living things are best explained by the intervention of a supernatural being (for a detailed account see Elsdon-Baker, 2015). In doing so, this poll not only entirely excluded the possibility of a respondent expressing belief in God *and* evolution by natural selection, but also imported wholesale categories emerging out of the highly distinctive cultural milieu of the United States.

The use of such flawed lines of questioning is particularly troubling because available data suggest that questions on this and similar themes are highly sensitive to alternative wordings. While the Gallup poll does not ignore theistic evolution in the way the BBC’s poll did, this poll, too, can be criticized for failing to offer an option that posits the special creation of humans by God within an ancient geological timeframe (Hill, in press). Indeed, when offered a slightly broader range of options, over half of those who identify as “creationists” in Gallup’s terms choose the position that “God both created and guided evolution” (see Hill, in press, pp. 34-37). Similar sensitivity is found in surveys that ask respondents about their view of the relationship between science and religion. Polls (carried out by Pew in 2009 and the Public Religion Research Institute in 2014) that ask people whether they see religion as “often in conflict” or “mostly compatible” tend to indicate that around 55 per cent of Americans regard science and religion as opposed (Hill, in press, p. 27). However, polls that ask whether religion and science are *incompatible* – a question that alludes to a more general and permanent state of incompatibility – produce quite different results. Only 17 per cent of respondents who were asked this question for Wave II of the Baylor Religion Survey in 2007 agreed that science and religion are incompatible (Baker, 2012).

Surveys also struggle to account for the polysemy of the concepts being analyzed. Gieryn (1983), in the article that introduced his famous concept of “boundary work”, highlighted how Christian fundamentalists battle to define “science” in an alternative way and thereby assume its “cognitive authority”. Small-scale qualitative studies with Muslims in the USA, Canada and Pakistan have also uncovered cases of individuals who affirm that science is compatible with Islam despite reading the Qur’an literally and refusing human evolution (Asghar, 2013; Everhart & Hameed, 2013). However, such groups could easily be conflated in polls with people that may hold entirely conflicting views (see McCain & Kampourakis, 2018).

### *New Developments*

There has been considerable room, then, for more sophisticated quantitative analysis to understand people’s perceptions of science and religion more fully, which recent research is beginning to fill (Evans, 2011; Noy & O’Brien, 2016; O’Brien & Noy, 2015; Roos, 2014). Alongside Ecklund and colleagues, other American sociologists have also begun to adopt more mixed-methods approaches.

Hill (2014) has developed sophisticated survey questions for accessing Americans’ attitudes towards evolution and religion, following a panel survey up with in depth interviews with a sub-sample of respondents. M. S. Evans (2012, 2016) conducted a quantitative media analysis and interviews with “ordinary” Americans in California and Florida to investigate the quality, quantity, and acceptance of debate about science and religion in the American public sphere. He concludes that, rather than conflict in public debate about science and religion being due to their essential incompatibility, it is the nature of public debate in America that is bad for science and religion, amplifying a conflict narrative. The American public debate has become dominated by a conservative Christian minority, sidelining more moderate voices. M. Evans also notes: “sociology began the twentieth century very interested in questions of religion and science, turned its attention elsewhere mid-century, and only recently has experienced a resurgence in religion and science questions.” (Evans, 2016, p. 12), citing his own 2008 article with J. H. Evans as an overview. Yet, this resurgence still only mainly pertains to the United States.

### **Qualitative Research**

More qualitative work in relation to science and religion has also begun to emerge from the USA. Toumey (1994) undertook early and innovative ethnographic research with creationists in North Carolina, which other American scholars have more recently built on. Binder (2009) researched Afrocentrism and Creationism in American public schools. Long (2012) conducted an ethnography at an American, publicly funded university where creationism vs biological evolution was a live debate. Guhin (2016) conducted an ethnography with two Protestant Conservative Christian and two Sunni Muslim high schools in New York City, all institutionally rejecting the theory of evolution. Guhin (2016) found this rejection to be far less salient for teachers and pupils in the Sunni Muslim schools. Similarly, Oberlin (2014) conducted an ethnography at the Creation Museum in Kentucky, USA, connecting science and religion debates to the importance of the built environment and museum studies and finding that employees were frequently more concerned about operational matters such as income, marketing, and visitor experience than an epistemological clash between science and religion. Starting from a social movement perspective (as

Oberlin did), Stobaugh and Snow (2010) and Silva (2013, 2014, 2018; Silva & Lowe, 2015) have analyzed the framing of American public discourse around evolutionism and anti-evolutionism. Stobaugh and Snow (2010) found anti-evolutionists' framing of their arguments to shift with legal losses over time. Analyzing letters to the editor in newspapers, Silva found literalist and atheist letter writers to equate evolutionism and atheism, and both groups also equating anti-evolutionism and all religion in their letters. In contrast, non-literalists did not make such assumptions. Kaden (2019) also analyzed conflict between creationists and anti-creationists in the American public sphere, based upon historical and qualitative research. Similarly to Silva, Kaden found individuals and institutions on the two sides of the debate to mutually reinforce each other. Anti-creationist organizations react to creationist organizations' public statements and activities, and creationist organizations in turn respond to these reactions, generating a feedback loop.

### Going Global

Alongside Ecklund *et al*'s work, there have been further efforts to begin to investigate science and religion debates sociologically beyond the borders of the United States. For example, Yalçinkaya (2011) has analyzed the historical import of the “conflict thesis” into the Turkish context. Rughinis (2011) has worked on acceptance of evolution and scientific literacy from Eurobarometer survey data in European countries and the General Social Survey and National Science Foundation scientific literacy quiz data in the United States, critiquing standard measures of both evolution acceptance and scientific literacy. Scheufele and colleagues (2009) studied the influence of religious belief on attitudes towards nanotechnology in Europe as well as the USA, finding a direct correlation, with greater distrust of nanotechnology in countries with higher levels of religiosity. From World Values Survey (WVS) data, Chan (2018) finds a less consistent link between religiosity and attitudes toward science in general across 52 countries, but, overall, a negative link between religiosity and trust in science. Chan acknowledges the ambiguity of questions from the WVS she employs, such as asking participants to rate how much they agree with the statement “Whenever science and religion conflict, religion is always right”. As she observes, “This question, however, is ambiguous as to whether the proposed conflict is a matter of knowledge claims, conflict between religious leaders and scientists' role in public debate, or something else entirely” (Chan, 2018. pp. 5, 6). Alongside the varied findings from her own analysis of international data, Chan (2018) reports the mixed findings from previous research regarding the relationship between trust in science and religiosity in the United States (Evans, 2012; Scheitle, Johnson, & Ecklund 2018). The varied results from studies using differing measures of trust in science, and specific aspects of science such as evolution and nanotechnology, suggest once again that question wording impacts results.

From the international research study led by Ecklund referenced above in the section on ‘Scientific Practice, Secularization, and Institutionalization’, Johnson *et al* analyze reference to celebrity British science advocate Richard Dawkins in semi-structured interviews about religion, the “science-faith interface”, and their careers conducted with biologists and physicists in the UK (Johnson, Ecklund, & Matthews, 2018, p. 5). As Johnson *et al* (2018) document, Dawkins is vociferously anti-religious in public debate about the relationship between science and religion. Forty-eight out of 137 British scientists interviewed referenced Dawkins. However, only 23 did across the seven other countries included in the study (see above), and these references were far less detailed. Johnson *et al* take the far higher number of and more

detailed references to Richard Dawkins as a distinctive facet of British public debate about science and religion. Whilst the majority of the 48 interviewees repudiated Dawkins' combative approach to public engagement, in which he supports science and attacks religion, 10 non-religious scientists endorsed it. British scientists in the study discussed and criticized Dawkins' frequent public assertion that accepting and understanding evolutionary theory requires rejecting religion.

Whereas Johnson *et al* interviewed professional biologists and physicists about religion and the science-faith interface, Unsworth and Voas (2018) present findings from an original nationally representative survey examining the impact of religion and education upon members of the public's attitudes to evolution in Britain. The survey included an oversample of the two largest religious groups in Britain: Anglicans and Catholics, and the four fastest growing religious groups: Muslims, Pentecostal Christians, and Independent Evangelical Christians. Unsworth and Voas find people identifying as having no religion to have the highest support for evolution, compared to respondents belonging to religious groups, and evolution acceptance to be lowest amongst Pentecostals, Independent Evangelicals, and Muslims. Yet, within these groups there is a lot of uncertainty and variation, related to education. Evolution appears to be an issue that lacks salience for Muslims in Britain. Unsworth and Voas conclude that the number of creationists in Britain is smaller than previously speculated, and that people in Britain are generally inconsistent and unsure in their views on evolution.

In India, Thomas (2018) conducted ethnographic fieldwork focused upon the relationship between science and religion at the prestigious Indian Institute of Science, Bangalore. This involved participant observation and interviews with scientists in various disciplines including biology and physics. He found, overall, an everyday coexistence of science and religion at the Institute. Caste, culture, and the religious tradition they had been raised were still important to scientist interviewees who identified as atheists (Thomas, 2017). Thomas also observed religious and scientific practice blending at the Institute (Thomas & Geraci, 2018). Thomas (2018) discusses the less antagonistic history of science and religion in India compared to in the West. He argues that social scientists researching science and religion "need to think beyond the Western imagination of atheism and the stereotypical Western conflict between religion and science..." (Thomas, 2018, p. 59), and provincialize the views of Richard Dawkins and other Western science popularizers who perpetuate the idea that one must be an atheist in order to be a good scientist.

These findings point to the importance of national context. Unsworth and Voas' research indicates that creationism may be a far less significant social movement in the UK than the United States, despite both being majority Anglophone, Western countries with strong historic and contemporary connections, and atheist evolutionist science advocate Richard Dawkins' apparent relative prominence amongst British scientists. New survey data is indicating similarly low numbers of people holding creationist beliefs in Canada as well as the UK (Elsdon-Baker et al., 2017). These findings underscore the distinctiveness of the United States of America in terms the public impact of anti-evolutionist organizations. United States-based findings and measures of attitudes toward evolution, science, and religion may not necessarily be indicative of international trends. We might expect to find less anti-evolutionism in general in other countries, and less public debate about science and religion in non-Western countries. The international findings presented also show the value of following up survey research with more in depth methods, and the significant

relationship between science and non-religion which sociological research has begun to highlight.

### Intersectionality

Research in the sociological study of science and religion internationally could also benefit from adopting a more intersectional approach. Race has begun to be recognized as an important constituent of constructions of science and religion in modernity by historians of science (Livingstone, 2011; Keel, 2018), and there is some sociological work emerging highlighting the dynamic in contemporary society (Jones et al., 2018). Recently, Bolger and Ecklund (2018) conducted 40 interviews with black and Latinx Christians in the United States. They found Latinx participants to be more concerned about science educators negatively impacting children's faith than black participants were, suggesting differences between racialized groups in terms of attitudes and understanding in relation to science and religion in America.

Science and technology studies has a long tradition of exposing exclusions and inequalities in science, on the basis of gender, race, and socioeconomics (Xie, 2014). Yet, religion is rarely a dimension considered. Noy and O'Brien (2018) have examined General Social Survey data to see how race, ethnicity, and gender intersect in relation to perspectives on science and religion in the United States. They conclude "we contend that ethnoracial and gender differences in perspectives on science and religion are rooted in historical inequalities in individuals' and groups' interactions with scientific and religious institutions." (Noy and O'Brien, 2018, p. 55). An extended intersectional approach would not only facilitate analysis of intersecting sites and forms of discrimination based upon social identities (globally, as well as domestically in the United States). It would also drive a push to challenge such discrimination (Crenshaw 1989; Hill Collins 1998; Hill Collins & Bilge, 2016), unmasking injustices implicit in popular Western narratives of science and religion.

### *Understanding Science, Accepting Science*

Analyses of the interaction between science, belief and culture were central to the classic early twentieth century studies by Merton (2002) and Weber (2002), yet today science and technology studies (STS) rarely brings these areas together (Gülker, 2012), and then usually in highly theoretical contributions (Latour, 2011). Since the 1960s, the associated field of the public understanding of science (PUS)<sup>3</sup> has been characterized by the attribution of a *deficit* in knowledge and/or trust to the general public (see Bauer et al., 2007). The critique of this "deficit approach", which has been associated with government-sponsored quantitative research into science literacy, has come from what Sturgis and Allum (2004) describe as a "critical" and "contextualist" school (especially in Britain). Emphasizing qualitative methods, this school takes issue in particular with the notion that lack of acceptance of the social benefits of science is primarily the result of poor understanding. It also charges advocates of the deficit model with failing to recognize that countervailing claims about evolution and climate change have as much to do with cultural formations, institutional machinations, political loyalties and moral orientations as with science education and communication. Hence, connection to the sociology of culture can be discerned (Wuthnow & Witten, 1988).

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<sup>3</sup> STS, PUS, Public Engagement with Science and Technology, and sociology of science are all strongly overlapping fields, as acknowledged by the scholarly association Society for Social Studies of Science (4S): <http://www.4sonline.org/society> (accessed 2.04pm 29th August 2018).

Over the last fifteen years, PUS scholars have emphasized not only the potential complementarity of “deficit” and “contextualist” models but also, in keeping with our comments above, that qualitative and quantitative research methods can provide a fuller picture when used together (Bauer et al., 2007; Sturgis & Allum, 2004). Central to this emerging synthesis has been the development of research programs, from a variety of disciplinary perspectives and combining methods, that have demonstrated how understanding and believing correspond in some domains, but not in others. In many cases, this research has turned on the impact of religious affiliation and religious beliefs on acceptance of science.

Survey and interview research by Hilderling *et al* (2013) and Hermann (2012) – carried out in the Netherlands and the United States, respectively – found students who reject evolution for religious reasons do not know less about it. Quantitative sociological research in the USA has uncovered similar patterns (Baker, 2013). Continuing in this vein of research which disrupts the traditional “deficit model” of public understanding of science, Allum *et al* (2014) also found knowledge of scientific research to not necessarily improve acceptance of it. In a UK-based study of pre-implantation and pre-natal genetic testing, they found that knowledge of implantation techniques improved attitudes toward genetic testing among those who identified as less religious, but not among those who claimed to be highly religiously committed (for qualitative analysis see Doolin & Motion, 2010).

Analyzing General Social Survey (GSS) data, Johnson, Scheitle, and Ecklund (2015) found that highly religious people in the United States are just as interested in and as knowledgeable about science as people who are less religious. They also found no significant association between interest in and knowledge of science. Overall, highly religious people were the least confident in science. However, “mainline Protestants, Catholics, and black Protestants report higher levels of confidence in science than the religiously unaffiliated.” (Johnson, Scheitle, & Ecklund, 2015, p. 117). J. H. Evans (2011), also employing data from the GSS in the USA, found evidence for what might be called *selective* epistemological conflict between conservative religion and mainstream science. Rather than being opposed to scientific methods and the claims that follow from them *per se*, Evans found opposition to scientific claims only in relation to issues where religious groups had been active in oppositional moral debate, such as global warming and stem cell research. In cases where religious argumentation was not prominent in conflict, such as in conflicts over genetically modified foods, opposition to science was not apparent. Continuing this research, in a recent sociological overview of the contemporary science and religion conflict in the United States, Evans (2018) finds that systemic knowledge conflicts between elites are frequently, inaccurately extrapolated to the American public’s views and beliefs. He concludes that for publics in the USA, religious opposition to a scientific claim is usually moral rather than epistemological. Evans also calls upon scientists to acknowledge publicly the moral dimensions to their work, such as climate scientists’ commitment to limiting human suffering through reducing climate change.

Similarly, based upon interviews, observations, archival research, and a national survey, Scheitle and Ecklund (2018) find that ordinary members of faith communities in the United States *do* have concerns and fears around specific aspects of science, particularly related to God’s role in the world and human nature. Yet, Scheitle and Ecklund also continue to find diversity and no necessary or essential conflict between science and religion for religious Americans.

Other research also supports the idea that opposition by religious people to specific areas of scientific research, like evolution, is driven more by social factors than a lack of scientific knowledge and understanding, or an essential clash between science and religion as ways of knowing about and understanding the world. Allgaier (2012) conducted a content analysis of newspaper coverage of a controversy that erupted in British media in 2002 regarding the teaching of creationism at a partly privately and partly publicly funded high school. He applied Irwin and Michael's (2003) concept of the "ethno-epistemic assemblage" to theorise how strategic coalitions form and fight for credibility and legitimacy in the public sphere regarding a single issue, such as teaching creationism. Issues other than the epistemological relationship between science and religion emerged as at stake: the relationship between religion and the state, the nature of science education in schools, school performance, and the role of private companies in education. From interview and questionnaire research, Falade and Bauer (2018) find complexity in the relationship between science and religion for publics in Nigeria as well.

In some of the work above (Allum et al., 2014; Johnson et al., 2015), religious worldviews appear to engender moral objections that are unaffected by knowledge of the scientific subject at hand. Elsewhere, people appear inconsistent in their objections to science (Evans, 2011, 2018) or to bracket away scientific knowledge from their identity and beliefs (Long, 2012). While polls on belief in evolution have tended to imply clear and coherent public positions on evolution and belief, more nuanced recent surveying has indicated that many Americans and Britons alike are unsure about their position on evolution, do not have a view, or do not think having correct belief is important (Hill, 2014; Unsworth & Voas, 2018).

Given that having a well-reasoned, or simply firmly held, position on a set of propositional statements relating to science and religion appears not to be the norm or even widespread, sociologists should, then, continue to ask what social and cultural factors *push people* into taking a position and feeling like a particular claim has salience for them. The specificity of the American context with its "culture wars" leading portions of the American population to become aware of, identify with, and feel loyalty to certain propositional claims, even to the extent that contrasting scientific explanations are resisted, must be considered (Hunter, 1991). Indeed, Garrison (2002) called for science and religion experts to engage more with cultural construction, and for sociologists to explain its value more clearly.

## **Conclusion**

The concepts "science" and "religion" are, in the sense that we understand them today, both recent, the former having emerged in the nineteenth century and the latter in the seventeenth (Harrison, 2006, 2015). Both terms were formulated in a post-Enlightenment context and advanced in response to specific intellectual transitions and institutional developments (Turner, 1978).

Sociology emerged against this same backdrop, and the fact that it did has undoubtedly influenced the attention paid by sociologists to the relationship between religious and scientific ideas and institutions (or the lack thereof: Evans & Evans, 2008). Yet sociology has changed over time and in recent decades started to reorient itself, placing it, we argue, in a much better position to examine science and religion as a topic of intrinsic interest.

The majority of empirical research undertaken to date has focused upon the United States of America, which represents an instructive but highly distinctive case,

and tended toward a quantitative approach and/or a focus upon Christian creationism. We have shown how sociologists have begun to undertake more qualitative, mixed methods, and international work, providing the foundation for a rich seam of future research. There is now the possibility of finding new theories, approaches, and points of empirical focus to shed light on how scientific knowledge and practice interact with culture and people's beliefs and identities.

There is a tendency to overstate the extent to which people form fully developed, broadly consistent philosophies on the basis of which they form positions that influence their behaviour. This is assumed in much industry polling on science and religion. It is present in some deficit models of science communication, which imply that education is sufficient to increase acceptance of scientific discoveries. It has also been present in some previous research with professional scientists, which proposed that a scientific way of thinking undermines religious belief. Whether such internal consistency of belief has ever been widespread is doubtful, but this assumption cuts directly against recent trends observed. It is quite possible that people across contexts do not always have a set of beliefs about science and religion that they are able to articulate without some kind of social prompting.

In general, the recent debate about science and religion – especially that associated with the rise of “New Atheism” – has been concentrated almost exclusively on supposedly competing philosophies, with the importance of cultural and political contexts neglected (Evans, 2018). This emphasis on philosophical tension invites a naïve view that recent public clashes over science and religion represent the latest skirmishes in a war that has continued in a broadly similar form for centuries. Historical work showing that the meanings of the terms “science” and “religion” – and the relationship between them – have shifted over time can go some way in correcting this, but on the evidence presented in this article we would say that science and religion is a subject that is in need of a nuanced sociological imagination too. Indeed, Ecklund *et al* (2016) stress the importance for more communication of social scientific research findings to move beyond the popular conception of conflict between religion and science, reproduced by some influential public figures (Coyne, 2015).

In the sociology of religion, the link between religion and culture (Edgell, 2012) is well-established, and so is that between science and culture in the sociology of science (Bourdieu, 1975). However, the link between culture, science, and religion requires more sociological attention internationally. Work considering symbolic and social boundaries (Ecklund, Park, & Sorrell, 2011; Guhin, 2016; Pachucki *et al.*, 2007; Scheitle & Ecklund, 2017) may shed greater light on collective and moral identities in science-religion interactions, facilitating greater focus on affect, meaning, power, and legitimacy, alongside belief and knowledge, for publics as well as elites. Increased attention to culture and intersecting inequalities whilst researching science and religion sociologically could aid more nuanced public understanding of what are significant contemporary social dynamics.

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