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Science, religion, and nonreligion: engaging subdisciplines to move further beyond mythbusting

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Abstract

Within the last twenty years sociological research on science and religion has provided new insights that challenge myths regarding conflicts between science and religion. Gaps in pre-existing work have been identified resulting in major shifts in the field. In particular, research has employed more mixed methods, widened its scope to become more international, and expanded to include nonreligion. Building upon these developments and critiques, this chiefly conceptual article explores a way to move forward by combining three fields of research in a novel way: the sociology of religion, the sociology of nonreligion, and the Public Understanding

of Science (PUS). These subfields all touch on relevant and interrelated topics. Sociology of religion contributes to parceling out aspects of belief, identity, and practice; focuses on lived experience along with positionality, normative commitments, and culture. The sociology of nonreligion draws more detailed attention to the association between science and secularism. Finally, including research on PUS provides resources for understanding trust in, and engagement with science dialogically, as well as lessons for effective public engagement.

Keywords

science, religion, nonreligion, trust, political orientation

Introduction

The interaction between science and religion has emerged as an important field of research within sociology. As of yet, however, there is no clear, established sociology of science and religion (in terms of training or programs). Sociologists contributing to the emerging field consequently tend to come from other subdisciplinary backgrounds, most commonly, the sociology of religion. Contributors have also drawn upon the Public Understanding of Science to a significant extent, and the more recent sociology of nonreligion has begun to establish findings of significance for the sociological study of science and religion. In this chiefly conceptual article, we argue there is scope for more conversation between the sociology of religion, the sociology of nonreligion, and the Public Understanding of Science in order to grow and enhance the emerging sociology of science and religion. This requires, initially, setting the background of the sociology of religion, the sociology of nonreligion, and Public Understanding of Science and

study of science and religion within them. This leads on to considering the emerging sociology of science and religion.

To date, the main trends in sociological research on science and religion have been: focus upon the USA; analysis of pre-existing datasets; focus on Christianity, on religious opposition to scientific fields and finding such opposition to concern morality, culture, and community more than epistemology (Catto et al., 2019). Therefore, it may be more accurate to refer to the sociology of science and Western Christianity. However, the field is entering a new phase, adopting mixed methodological approaches to examine trends and debates, with an increasing number of researchers working across multiple countries and cultures, including countries where Christianity is not the majority religion (Ecklund, et al. 2019). In this article we use the general phrase “science and religion” rather than “science and Western Christianity” because it is more inclusive. Recent sociological research on science and religion substantiates where there remain gaps and further opportunities for collaboration between and incorporation of the sociology of religion, the sociology of nonreligion, and the Public Understanding of Science. Namely, a more lived, contextualized, relational approach to science and religion, which helps address the cultural life of science and diversity of contexts to a greater extent; more consideration of nonreligion, politics, and secularization; lessons from and for science communication, and, lastly, (and relatedly) positionality and normativity. PUS has tended to frame religion narrowly, and sociology of religion and nonreligion research in this area to be of limited practical applicability. Combining approaches can lead to recommendations for effective public engagement (Aecthner, 2020a, 2020b; Taragin-Zeller et al., 2020).

The sociology of religion

Following Robert Merton's (1936) early work, the sociology of religion and sociology of science developed as separate subdisciplines, rarely engaging with one another. In the early to mid-twentieth century, the sociology of religion was preoccupied with the decline of church-based religion in Northern and Western Europe. Following in the footsteps of Comte, Marx, Weber, and Durkheim, a necessary and negative relationship between religion and modernity was established (Berger 1967, Wilson 1966), albeit a nuanced and contextualized one (Martin 1978). For sociologists of religion, science was the methodology and religion was the object of study. Science was only considered at the macro-level as a contributory factor to societal secularization (Wilson, 1966). From the 1980s onward, new paradigms emerged (Warner, 1993).

These developments led to greater empirical and theoretical complexity and diversity in the sociology of religion. For example, in the United States, McGuire (2008) and Ammerman (2007) developed everyday and lived approaches to religion approach, shifting focus away from official, doctrinal religion toward daily practices, especially those of women. Indeed, gender became a key dimension of interest to sociologists of religion (Woodhead, 2008).

Relatedly, in Europe, attention shifted toward the new age and alternative spirituality in which women predominate (Heelas, 1996; Heelas and Woodhead 2004), and disentangling aspects of religiosity, indicating that belief may not be declining as quickly as religious affiliation (Davie, 1994), as well as globalization (Robertson, 1992). Sociologists of religion also proposed thinking about religion as a chain of memory (Hervieu-Léger, 2000) or bricolage in modernity (Altglas, 2014). Different aspects of secularization were further delineated: decline in individual religiosity; reduction in the size and influence of religious organizations; functional differentiation i.e. politics, health, law, education becoming separate spheres independent from

institutional religion (Dobbelaere, 2004). More recent work has paid further attention to the seemingly contradictory trends of the continued decrease of religiosity and an increased visibility of religion in Western countries (Furseth, 2018; Köhrsen, 2012). Interactions between religion, race, class, and gender are also being investigated in the US (Frost and Edgell, 2017; Wilde and Glassman, 2016).

A perennial challenge for and subject of discussion throughout this range of theoretical and empirical development has been articulating what religion is and how to research it. Critical analysis of how best to measure religion, parsing out practice, belief, membership, and values, continues (Wuthnow, 2015: 12). In a recent article on the state of the subdiscipline, Edwards (2019) calls for the sociology of religion to reclaim its roots (from Du Bois as well as Marx and Weber) by returning to the study of power: that of religious institutions, religious ideas, and scholarly epistemologies, using both quantitative and qualitative methods. As noted above, it is primarily sociologists of religion who have undertaken the sociological study of science and religion to date. Edwards' agenda for the sociology of religion can also be applied to the sociological study of science and religion, which the sociology of nonreligion is also starting to help open up new avenues for.

Sociology of nonreligion

As church-based religion declined in Europe, the numbers choosing the option “no religion” in surveys increased, with a similar trend also observed in the United States (Cragun et al., 2017). This phenomenon, alongside the rise at the turn of the Millennium of a publicly prominent and vocal group of ‘New Atheists’ (Kettell, 2013), prompted the growth of sociological research on nonreligion and the secular both sides of the Atlantic. Such research has demonstrated that nonreligion constitutes much more than just an absence of religion. Although the meaning of the

term “nonreligion” is widely debated (Lee, 2012), it serves as a productive umbrella category for a diversity of beliefs, values, and behaviors defined by their distinction from religion (Quack and Schuh, 2017). Empirical studies from North America have flagged how science and evolutionary science specifically can be rallying points for organized nonreligious groups’ defense of science (Cimino and Smith, 2011; García and Blankholm, 2016; LeDrew, 2016), but have not yet addressed this connection in depth.

Social studies of science and the Public Understanding of Science

As noted above, since Merton’s early work arguing that Protestant pietism helped drive the seventeenth century experimental science revolution, the sociology of religion and sociology of science parted ways for the most part. As sociologists of religion in the late twentieth century nuanced and shifted away from the dominant theoretical paradigm of secularization theory, sociologists of science moved away from the functionalism of Merton and to more social constructionist approaches (Collins, 1983). Researchers began to examine the social, political, structural, and exigent factors affecting scientific knowledge production (Barnes, Bloor and Henry 1996), including the actual processes of knowledge production in scientific research laboratories (Knorr-Cetina and Mulkay, 1983). With the notable exceptions of Gieryn (1983) and Latour (2013), who have engaged with religion in their work, the more traditional mode of sociology of science remained primarily concerned with studying professional scientific knowledge production, its institutional norms and constraints, as well as debates on how such studies should be carried out (Pickering, 1992).

Notably over the last fifty years, there has been a growing interest in science in the public domain, both in terms of science policy controversies and public attitudes towards science (Irwin and Michael, 2003). As social scientists sought to investigate a perceived crisis in public understanding of science, the multidisciplinary field of the Public Understanding of Science (PUS) emerged. Reflecting earlier 19th and early 20th century modes, practices and social agendas in relation to public scientific literacy and education, initially, scientific organizations, policy makers, and some researchers adopted a “deficit model” approach, which assumed that any lack of public acceptance of scientific ideas, or negative attitudes towards science or emerging technology, was largely due to a lack of knowledge and understanding of scientific concepts or the nature of science (Bauer et al., 2007; Bodmer, 1985). In the US, the National Science Foundation developed measures of scientific literacy (Miller, 1983). Archetypal of PUS research employing this paradigm in the UK, and influenced by the American tradition, were Durant et al.’s (e.g. 1989) quantitative surveys of the public’s scientific literacy. However, part of the development of the PUS research agenda was in the critique of, and moving beyond, this unilateral knowledge-based framing of public attitudes, unpicking the assumptions embedded in the framing of the problem as one only of deficit on the part of publics (e.g. Irwin and Wynne, 1996).

Researchers began viewing the relationship between scientific knowledge production and public reception of that knowledge as dynamic and reciprocal: publics were more than passive recipients of information (Wynne, 1992). This move from a cognitivist, epistemically-framed conception of science-public interactions, to a more critical and reflexive approach, has been labelled the “ethnographic,” “contextualist,” or “constructivist” strand of PUS research (Irwin

and Michael, 2003; Sturgis and Allum, 2004; Wynne, 1995). The newer PEST (Public Engagement with Science and Technology) label reflects acknowledgment of the dynamic relationship between science and publics, and a normative commitment to more democratic science policy (Stilgoe et al., 2014).

While there have been shifts in the academic literature away from an epistemic, one-way relationship between science and publics; the knowledge deficit model persists both implicitly and explicitly in science communication practice and policy making (Simis et al., 2014), with the attendant normative commitment to the promotion and public acceptance of science. Some argue that in PUS research, a public deficit of knowledge and attitudes was recast as a deficit of trust, with deficit thinking remaining embedded (Bauer et al., 2007). Within this framework, engagement with science increases public trust, reinforcing the older paradigm's main concern to promote the legitimacy of science in society. This is in contrast to the sociology of religion, which aims towards methodological agnosticism: setting aside the question of the veracity of the ultimate truth claims of respondents (Davie, 2013). This observation points to the distinctive ways that science and religion are socially constructed and understood.ⁱ

The impact of this enduring normative commitment for some areas of PUS and PEST is the tendency to take an explicit or implicit knowledge-based approach focusing on scientific literacy, publics' attitudes toward science, or trust in science. Within this context, religion became a variable of interest, with the potential to impact knowledge and acceptance of scientific concepts. Therefore, analysis and discussion of religion or religious identity in this field tends to frame it as a hindrance, which explains resistance to publicly debated areas of science such as evolution (Francis and Greer, 1999; Miller et al., 2006; Hildering et al., 2013; Miller et al., 2021), pre-implantation genetic testing (Allum et al., 2014), or stem cell research (Allum et al., 2017; Ho et

al., 2008). While scholars have used the concept of social identity within PUS and PEST to help explain public reactions during scientific controversies (Wynne, 2003), little thought has been given to the “cultural life” of science and how it can be a meaningful part of people’s identities, values, and beliefs (Jones et al., 2020a). Similar trends are discernible in the sociological study of science and religion to date, with some engaging directly with PUS approaches (Catto et al., 2019).

The emerging sociology of science and religion

Since the 2000s, sociological research on science and religion has increasingly flourished, mostly in the US. Evans verified that Americans’ concerns about areas of scientific research including evolution, stem cell research, and climate change are driven by moral, political, and social interests far more than by epistemology (Evans, 2011; Evans, 2018). This and Ecklund and colleagues’ research (Ecklund and Park 2009; Ecklund 2010; Ecklund and Long, 2011; Ecklund and Scheitle 2018; Vaidyanathan et al., 2016) added further evidence to historical work showing that the idea of religion and science as locked in an eternal, inherent conflict is untenable (Harrison, 2015), and demonstrated the diversity of religious Americans’ perspectives on science and religion.

Analyzing data from the National Study of Youth and Religion, Longest and Smith (2011) conclude that views are diverse although there is an overall trend for young Americans to regard science and religion as in conflict. They do not find a consistent relationship between high religiosity and regarding religion and science as in conflict. Indeed, quite the opposite: increased religiosity correlates with regarding science and religion as compatible. Longest and Smith (2011) also emphasize how social factors (such as region and education) affect beliefs and

attitudes in relation to science and religion. The sociologists conducting the science and religion research cited above come from backgrounds researching religion.

In contrast, O'Brien comes from a background in the sociology of science, and Noy the sociology of development. From analysis of General Social Survey (GSS) data on science and religion, O'Brien and Noy (2015) distinguish between traditional (preferring religion to science, 43 per cent), modern (preferring science to religion 36 per cent), and post-secular (viewing both science and religion favorably, 21 per cent) perspectives among the American public in relation to science and religion. They conclude that the public, political framing of evolution and stem cell research impact these perspectives. According to O'Brien and Noy (2015:109), "religion shapes individuals' worldviews in ways not captured by conventional measures of religion such as denominational affiliation or religious attendance", setting the scene for an expanded conception of religion considering nonreligion as well.

Baker (2012) (coming from a background in researching religion and nonreligion) also takes a differing approach by examining the connection between science and secularism, using the Baylor Religion Survey. Baker concludes that nonreligious Americans express strong support for science and scientific views. Atheists, and to a lesser extent agnostics, endorsed a view of science and religion as epistemically incompatible, thus introducing sociology of nonreligion work disaggregating the "nones" into sociological research on science and religion.

Working within the sociology of science and engaging with a PUS perspective, Gauchat (2012) uses GSS data to investigate trust in science, finding that in the United States, social and political conservatives who frequently attend church see a decline over time in their trust in science. Yet, in a later analysis of the National Science Foundation's Survey of Public Attitudes Toward and

Understanding of Science and Technology, he (2015) comes to a more nuanced picture of left-right dynamics, seeing differentiated attitudes toward scientific conceptions, along with secular and religious concerns and misgivings among conservatives in America.

This brief, selective review highlights the main trends in the sociological study of science and religion as it developed following the turn of the century (Catto et al., 2019): focus upon the US and Christianity; analysis of pre-existing survey data (particularly from GSS); political, cultural, and moral concerns affecting publics' positions on science and religion, and the tendency to focus on religious opposition to scientific topics (rather than religious and nonreligious populations' support for science). It also shows that findings vary depending upon the data set analyzed. Differently designed surveys lead to distinct results, serving as a reminder to pay attention to question wording, issue framing, and the limitations of cross-sectional survey research (Elsdon-Baker, 2015, 2020; McCain and Kampourakis, 2018).

In a review of survey-based research on science and religion in the US, Hill (2019) identifies various issues with pre-existing measures. These include failing "to capture the broader cultural significance of public understandings of science..." (Hill, 2019: 46), alongside social context and group identity. Similarly, Gauchat (2012) notes that PUS research has not sufficiently addressed the influence of ideological dispositions upon public attitudes toward science. These observations lead onto consideration of how the sociological study of science and religion has expanded and entered a new phase, including approaches from the sociology of religion, sociology of nonreligion, and PUS to a greater extent.

Merging traditions: a new phase

Baker et al. (2020) conclude from analysis of the Baylor Religion Survey that Christian nationalism mediates the impact of political identity upon respondents' views of competing authority between science and religion, human origins, and climate change in the US. Baker's co-authors Perry and Whitehead both come from backgrounds in the sociology of religion. Perry leads a 2021 article based upon data from an original panel survey (on which Baker is a co-author) which concludes that Christian nationalism negatively impacts Americans' scientific literacy: ideology rather than ignorance matters. They draw upon Science and Technology Studies (STS) to pay attention to the alignment of knowledge and power.

In a more recent analysis of GSS measures of confidence in science and religion as institutions between 1973 and 2018, O'Brien and Noy (2020) also address the politicization of science and religion in the US, finding that confidence in both has become increasingly split along partisan lines. Whilst "most people in these data had the same level of confidence in science that they did in religion" (O'Brien and Noy, 2020: 457), O'Brien and Noy identify a trend of Republicans growing less confident in science and more confident in religion, and Democrats the reverse. They also note the simultaneous decrease in religiosity and intensification of public contestations concerning science and religion in American society, raising the question of the nature and extent of secularization (Voas and Chaves, 2016). From analysis of GSS data between 2006 and 2014, Noy and O'Brien also conclude that race, ethnicity, and gender affect perspectives on science and religion in America (Noy and O'Brien, 2018:53). They find Americans' attitudes on science and religion to correlate with other social attitudes (Noy and O'Brien, 2016). Hence this work contributes to expanding sociological research on science and religion beyond a "deficit model", heeding Edwards' 2019 call to the sociology of religion to resume the study of power.

Salazar et al.'s (2019) study of race and attitudes toward Creationism in the US also draws attention to race as a significant (and neglected) factor in sociological research on science and religion.

In an analysis of data from the International Social Survey Program (ISSP), O'Brien and Noy (2018) find national context to affect trust in science and religion, alongside education and religiosity. The connection between education and acceptance of science emerges in a subsequent analysis of ISSP data (Noy and O'Brien, 2019). This article does not consider religion alongside science, but does show the value of considering the relationship between science and values in context.

There has been a welcome expansion of sociological research internationally (Jones et al., 2020a). With a background in research on religion, Chan (2018) analyses World Values Survey data to explore connections between religiosity and orientations toward science crossnationally. She finds, overall, the former to correlate negatively with the latter, but, once again, national context mattering. Ecklund led a research team studying the attitudes of biologists and physicists toward religion in eight countries using a combination of an original survey and in depth interviews (Ecklund et al., 2016; Johnson et al., 2018; Sorrell and Ecklund, 2019). Again, they find national context (including the nature of the science infrastructure and religion-state relations) to impact attitudes.

There has also been a turn to more qualitative and mixed-methods sociological research on science and religion, both in the US (Guhin, 2016; Long, 2011) and internationally. For example, Renny Thomas has conducted ethnographic fieldwork with scientists at a prestigious research institute in India. Thomas (2018) finds the science-religion interface to be very different from

that found in Western countries (America in particular). Combining interests in the sociology of religion, Science and Technology Studies, and Anthropology, he argues that nonreligious identities and perceptions of science and religion are shaped by context, as well as religious ones. Indeed, interesting work on science, nonreligion, and identity is also beginning to emerge internationally (Ecklund et al., 2019; Lee, 2019). Working from backgrounds in the sociology of religion and history of science, Jones et al. (2019) highlight the presence of Islamophobia in interviews with non-Muslim Britons on science and religion. Falade and Bauer (2018), with expertise in science communication, examine survey and interview data on attitudes toward science and religion in Nigeria. They find high trust in both.

Tiaynen-Qadir et al. (2021) describe themselves as continuing a trend of critical sociological research on science and religion. Analyzing interview data gathered with individuals working and studying within universities and health clinics in Finland and Sweden, they find global institutionalized secularism and scientific rationality affecting religious people's experiences, "However, we have also found an interesting difference, namely the virtual absence of discussions on evolution and creationism that we see dominating US public debates (Long, 2011). This can be partly explained by the fact that the matters of religion have been traditionally considered a private matter in Nordic countries, and the polarization takes a less explicit and more subtle character." (Tiaynen-Qadir et al., 2021: 17). This work again draws attention to the polyvalent nature of secularization, and how this multifaceted social process interacts with science and religion dynamics. Tiaynen-Qadir et al. argue that tensions between science and religion need to be studied at a global, insitutional level, as well as the national level. Hence, perspectives from the sociology of religion and the sociology of nonreligion are incorporated, as well as a nuanced insitutional understanding of science based in STS.

In sum, recent research in the nascent sociology of science and religion indicates expansion internationally and theoretically with increased attention to ideology, authority, and contextual factors. This leads onto consideration of where there remain gaps and opportunities for greater learning and exchange between the sociology of religion, sociology of nonreligion, and PUS in the sociological study of science and religion.

Further opportunities for collaboration and incorporation

The preceding mapping of developments points toward areas of contact and avenues for further development. Both science and religion have significant social authority. Research has begun to show that worldviews, beliefs, and identities are significant to both. As noted by Hill (2019) and Gauchat (2012), more work is needed to investigate publics' beliefs and values associated with science.

A lived approach and more contextual approach for PUS

A number of foundational studies in PUS have shown science-public interactions are about far more than scientific knowledge, and to frame them in that way restricts the myriad factors which contribute to public attitudes (e.g. Irwin and Wynne, 1996). Numerous studies note the instability and heterogeneity of the categories of science and religion themselves. O'Brien and Noy (2020) treat science and religion relationally as sources of cultural authority, employing Fligstein and McAdam's (2011) elaboration of Bourdieusian field theory. Science and religion are two related social fields. When considering the connections between science, religion, and politics for Americans, Sherkat (2017) also employs the concept of fields. Tiaynen-Qadir et al. (2021) treat science as a social and cultural institution, whilst Perry et al. advocate for a "folk epistemologies" orientation that views knowledge systems as socially constructed, localized

understandings of agreed upon points of belief” (Perry et al. 2021: 932). Such work, alongside sociological work disaggregating religion, indicates potential avenues for further disaggregating science as well, and treating these fields’ cultural authority relationally in context (Martin, 2003).

Involvement in science measures do include attendance at museums or zoos and aquariums. Yet, focusing on attendance at science-related attractions is limited in terms of the geographic or socio-economic ability of people to access such institutions and does not always indicate a desire to be involved in science (National Science Board, 2018). To further expand research beyond traditional approaches that focus on knowledge, trust, or acceptance of science and scientific concepts, and potentially to capture a wider range of forms of engagement and identification with science, as well as religion, researchers could observe the role of science in publics’ daily lives, asking questions such as: How is science’s significant cultural authority reflected in people’s lives? How does it relate to social identities? What values and beliefs are associated with it? Is it seen as socially desirable to be supportive of science? By accessing dynamics in context in greater depth, such an approach could shed more light on the seeming puzzle between broad public enthusiasm for and interest in science and resistance to specific fields and concepts (Funk, 2018).

Nonreligion, political orientation, and secularization

There does appear to be an increased affinity between nonreligion and science identity (which PUS research has tended to ignore, instead focusing on the potential negative effects of religiosity on attitudes toward science). Yet, the sociology of nonreligion shows that analyzing the nonreligious in aggregate can mask diversity. The nonreligious and nonspiritual are not uniformly pro-science; whereas neither are the religious or spiritual unequivocally against it- in and beyond the United States.

Previous studies have indicated that individuals' political positions exert some influence on attitudes towards science (see above). It should not be assumed that religious identity plays a more causal role in relation to attitudes towards science than political identity, or vice versa. Recent data indicates alignment between religious and nonreligious concerns in relation to science connected to political orientation in the United States (O'Brien and Noy, 2020). What might be the convergent or divergent factors at play in both nonreligious or religious publics' negative attitudes towards, or perceptions of, science, and religion? This can potentially reveal far more about diverse publics' attitudes towards science than simply focusing on what is considered to be the most problematic group in any population, e.g. White Christian conservatives within the United States.

It would be inaccurate to assume that secularization in terms of increased religious disaffiliation leads necessarily to an increase in perceived value of science in society. In the American context, O'Brien and Noy (2020) point out the simultaneous decrease in religiosity and intensification of public debates regarding science and religion, and Tiaynen-Qadir et al. (2021) the more subtle and implicit nature of political polarization in Nordic contexts (as well as the more privatized nature of religion). Little attention has been paid so far to the socio-political landscape of science and religion within national contexts, for example, funding for biomedical research (Fallone, 2011). Integrating subfields to a greater extent provides the opportunity to consider the interaction between science, politics, religion, and nonreligion within secularization processes.

Science communication

As seen, American sociological research on science and religion has been concerned with political and social polarization (Evans, 2013). Michael S. Evans' (2016) research demonstrates that American public debate on science and religion amplifies polarized voices, and is dominated

by a vocal conservative Christian minority, marginalizing more moderate voices. This indicates that there might be benefits to resisting polarized public narratives that pit certain fields of scientific research and religiosity against one another.

In terms of addressing public resistance to particular areas of science, PUS and science communication research surmises that informing publics that they are incorrect is ineffective. Experts also need to listen to and understand publics' concerns and what drives them (Frewer et al., 2004). Studying a diversity of perspectives has been found to contribute to changing perceptions for improved learning in relation to evolutionary science and religion (Barnes et al., 2017).

Aechtner's (2020a) research on the use of persuasion tactics in the "Evolution Wars" is a recent example of how sociological research on science and religion can incorporate lessons from science communication. Aechtner (2020b) draws upon successful methods of science endorsement to make concrete recommendations to evolution advocates about how they might improve pro-evolution communication. Taragin-Zeller et al. (2020) researched Haredi community responses to public health messaging during the Covid-19 pandemic in Israel. They incorporate science communication and sociological literature on science and religion and highlight the unequal distribution of science communication given the relatively privileged social locations of science communicators and their biases (including against religious minorities). Taragin-Zeller et al. (2020) recommend religiously-sensitive science communication involving communal representation from minority groups. Both these studies show ways ahead for continuing to integrate social studies of religion and science constructively, for effective science communication.

Values, positionality, and normativity

Aechtner (2020a: 232-33) addresses the challenge of normativity directly: “if we are to accept that it is in the public interest for people to be well informed about established scientific theories, because the misapprehension of science can have grave consequences, then it is also ethically viable to use a range of communications strategies to that effect.” Science promotion in the public sphere is not value neutral. It includes visions of the way the world ought to be, primarily one in which social improvement is achieved through the application of science and science education. Edwards (2019) called for the sociology of religion to apply mixed methods to the study the power of institutions, ideas, and epistemologies. Some areas of STS and critical PUS recognize there are other valid ways of knowing (Salazar Parreñas, 2018). However, in some areas of PUS and science communication practice the underlying, sometimes uncritical, assumption of the sole primacy of scientific knowledge or expertise remains, excluding other forms of knowledge and experience. Sociology of religion offers further insight into methodological agnosticism, reflexivity, and positionality: tools for explicitly addressing normativity. Critical approaches toward secularization can also help unpack sociology’s own values associated with nonreligion and science (Cadge, Levitt and Smilde, 2011; Smilde and May 2015). For example, Aechtner (2020b: 39) addresses the dangers of associating evolution with atheism in science communication: it risks alienating religious groups.

Conclusion

Building upon previous sociological research on science and religion, the purpose of this article has been to take preliminary steps toward showing how greater integration of approaches from the sociology of religion, the sociology of nonreligion, and the Public Understanding of Science (PUS) will help take the sociology of science and religion forward.

Sociological research on science and religion has moved well-beyond busting the myth that science and religion are inevitably in conflict. Scholars researching in the emerging sociology of science and religion come from a variety of academic backgrounds, most notably the study of religion. As the field embeds, there is opportunity for rich, new seams of cross disciplinary research examining in depth how values, beliefs, identities, and practices interact in relation to science for religious and nonreligious people, including: parsing out divergence between different types of science concerns; thinking about the social desirability of being perceived as endorsing science, given its cultural authority; and ensuring we are not inadvertently imposing or implying the salience of one social identity over another, or treating groups as monoliths. The sensitivity of question wording, issues of respondents' interpretations, and limitations of cross-sectional surveys all impact research results. Even in the USA, a society where there is distinctive high profile, polarized public debate on science and religion (Evans, 2016), publics' attitudes are mixed. Religion is not necessarily driving skepticism regarding scientific concepts (Ecklund and Scheitle, 2018). However, it might be driving some publics' concerns over how society is changing or the potential for negative consequences of science for society.

Examining the divergence between types of science concerns in relation to values and beliefs can be useful to indicate possible future qualitative and quantitative research directions, laying the groundwork for further understanding beyond simply (non)religious identity or political orientation. Science has a cultural life beyond institutional knowledge production which affects perceptions of both science and religion and consequently requires greater examination.

Increasingly integrating the subfields of the sociology of religion, sociology of nonreligion, and PUS can help examination of the dynamics of global institutionalized secularism and scientific rationality and contextual specificity, as sociological research on science and religion continues

to expand internationally and beyond Christianity, thinking critically about secularization (Tiaynen-Qadir et al., 2021). Recent cross-national research suggests that specific religious traditions continue to impact values and cultures transnationally (White et al., 2021). Aechtner (2020a; 2020b) and Taragin-Zeller et al. (2020)'s work in particular shows how lessons for public engagement can be drawn from theoretically-informed work beyond mythbusting. The current pandemic underscores the urgency of continued dialogue across approaches to science and religion (Perry et al., 2021).

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ⁱ Sociology of religion's methodological and epistemological approach to truth claims place it more in line with the methodological relativism of early sociology of science (Latour and Woolgar, 1979; Collins, 1983; Latour, 1987), including the strong programme in the sociology of scientific knowledge; treating successful scientific and failed explanations of phenomena symmetrically (Haddock, 2004).