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Global perceptions of religious and non-religious scientists

Archive for the Psychology of Religion

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Abstract

Previous research investigating perception of science and scientists indicates that certain physical, behavioural and belief system-related attributes are associated with scientists. Some of these include white, male, reserved and devoted to work. The current research takes an international approach into perceptions of science and scientists related to (non-)religious social identity. Four studies ($n = 1146$) across four countries (the United Kingdom, Germany, Spain, Argentina) investigate perceptions of scientists with religious social identity. This research included several targets with multiple identities, combining (non-)religious identity (religious, spiritual, atheist, non-religious or none specified) and scientist identity (scientist or evolutionary scientist). Findings show that the perceiver's own (non-)religious social identity relates to their view of scientists. In addition, exploration of trust in scientists with differing (non-)religious identities by personal (non-) religious identification revealed not only an in-group bias, but an overarching bias towards a scientist without any (non-)religious identification, which provides an interesting avenue to further explore.

Keywords

Beliefs, groups, identity, religion, science and religion, self-concept

When one thinks about science, or envisions a typical scientist, what tends to come to mind? What kind of image does the term 'scientist' evoke? We may think of scientists speaking around the pandemic (Patrick Vallance in the United Kingdom, and Anthony Fauci in the United States), which reinforces the stereotypical view of scientists as male. We may also consider popular media representations such as those of a 'mad scientist' (like Dr Jekyll, Dr Frankenstein, Dr Strangelove)

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or a ‘maverick’ fighting against the government or some institution (like Dr Ian Malcolm in the Jurassic Park films, Dr Bruce Banner in the Marvel comic universe). All of which reinforce a particular view of scientists and scientific leadership. Previous research has explored perception of scientists relating to physical appearance (Chambers, 1983) and some of this has explored values and behaviours (McPherson et al., 2018), finding that there is a similarity in how scientists are perceived by different groups. Building on this foundation, our research will go one step beyond this question of what a typical scientist looks like, and ask: what attributes and characteristics do people across different country contexts associate with scientists? As previous research has shown that what is considered stereotypical and counter-stereotypical of scientists differs depending on the scientists’ indicated religious beliefs as well as the (non-)religious identity of the participant (Sharp et al., 2022), we also explore to what extent participants’ (non-)religious identities as well as the identity combination of the scientist target (e.g. ‘religious scientist’, ‘atheist scientist’) inter-plays with those perceptions. Finally, to investigate wider cultural narratives, we collected data across four countries (the United Kingdom, Germany, Spain, Argentina). Altogether, this makes our study, to our knowledge, the first quantitative and multi-country exploration of stereotypes, attributes and characteristics that are commonly associated with scientists.

Previous research on perceptions of scientists

Throughout history, the most famous scientists tend to represent a homogeneous group with similar physical features and connoted traits. For example, Galileo, Newton, Darwin and Einstein were all male and white, typically portrayed as older, pursuing research, intelligent, socially awkward and dedicated to their work. Besides such common scientist exemplars, it is important to consider the power of Western media on the publics’ perception of scientists – a simultaneous reflection and reinforcement of or influence on who is perceived to be a stereotypical scientist.

Perceptions relating to physicality

Early research into views of scientists shows that scientists are often perceived or stereotyped as smart, isolated, obsessive and male (Mead & Métraux, 1957). A more recent overview of the stereotypes and traits of scientists includes similar items such as ‘clever, bright, reserved, socially clumsy people, devoted only to their work’ (Tintori, 2017, p. 2). Beyond lists of traits and with an aim to understand a more complete picture of the view of scientists, the Draw a Scientist Task (DAST) employs a different approach to understanding these. The DAST is deceptively methodologically simple: a teacher or researcher asks the participants (students in a classroom, children in a school, etc.) to ‘draw a picture of a scientist’ (Chambers, 1983; Finson et al., 1995). Then, researchers code the responses. The DAST results indicate that stereotypes of a scientist are relatively stable across time, and across the various samples which have been investigated: a stereotype including white, male, glasses, specific activities, and there are also specific traits that tend to be associated with scientists (see meta-analyses of DAST: Ferguson & Lezotte, 2020; Miller et al., 2018). These traits and physical attributes have held true even when conducting DAST research with different genders (e.g. male and female teacher candidates within the United States: McCarthy, 2015) and contexts outside of the United States (e.g. Turkish samples: Memis et al., 2020; Türkmen, 2008; Özel, 2012).

The research above indicates that stereotypes of a scientist are relatively stable across time, and across the various samples which have been investigated: a stereotype including white, male, glasses, specific activities, and there are also specific traits that tend to be associated with scientists (Ferguson & Lezotte, 2020; McCarthy, 2015; Miller et al., 2018). However, there is some room for further variability in portrayals of scientists with the DAST and how this reflects wider

cultural narratives. While in the examples above there was little variability between male and female teacher candidates of university age in portrayals of scientists (McCarthy, 2015), younger girls sometimes portray scientists as female. However, as participant age increases, females are more likely to portray scientists as male which could indicate more entrenchment over time of a cultural stereotype of a scientist as being male (Miller et al., 2018). While these homogeneous portrayals are reflected in the DAST, there may also be a methodological issue to consider in these portrayals and the similarities found in scientist views. Researchers utilizing the DAST often use features identified by Chambers (1983) as a baseline for what to look for in participants' drawings. Although participants are not given any instructions, nor do they participate in any discussion, beyond being asked to 'draw a picture of a scientist', and the task itself therefore remains objective, there may be a methodological element to consider with the similarity of these findings. Our research aims to address this by using a survey methodology to investigate to what extent participants associate varying characteristics with different scientist targets, providing us with data that is more comparative.

Perception beyond physicality

The DAST focuses mainly on a visual portrayal of scientists; however, it is evident in the traits listed that there are those beyond physicality that can be inferred from these drawings (Ferguson & Lezotte, 2020; Miller et al., 2018). These perceived traits can have an influence on one's interest in science and likelihood of pursuing a scientific career. In a study investigating perceived self-scientist discrepancies on different values and traits relating to interest in science, participants were asked to rate both the self and scientists on various traits, behaviours and values related to communality (e.g. trait: 'caring', behaviour: 'help the community', value: 'altruism'), agency (e.g. trait: 'powerful', behaviour: 'solve problems independently' and value: 'being autonomous') and science (e.g. trait: 'analytical', behaviour: 'answer questions with data', value: 'truth') (McPherson et al., 2018, p. 885). These ratings were combined to compute a level of perceived discrepancy between the self and a scientist. Those who indicated a larger perceived discrepancy between the self and the typical view of a scientist (mainly related to the traits, behaviours and values relating to science) also reported less interest in a scientific career (McPherson et al., 2018). The way in which participants viewed themselves, as well as a typical scientist, related to their interest in (and thus likelihood of pursuing) a scientific career. This indicates that the view of the self as an identity, as well as view of scientist identity, is important in considering perception of scientists. Our research takes all of these into account: including an element of personal social identity, as well as stated scientist identity, to investigate how these interact with each other in perception of scientists.

The perception of a scientist encompasses not only a physical aspect but also attitudinal, dispositional and behavioural aspects (McPherson et al., 2018). These aspects provide individuals with a complete view of a prototypical person who works in sciences and thus potentially capable of being a scientist. The view of the self also influences the way in which others are seen and personal interests (McPherson et al., 2018). Stereotypes serve an important purpose as a heuristic to aid our understanding of the world around us and provide some sense of stability (Hogg, 2007). However, while the above-mentioned DAST research shows some of the stereotypes people associated with scientists, there is not a consideration of religious identity. Our identities influence the way in which we see the world and the way in which we perceive others (Tajfel & Turner, 1986). Our research aims to gain a more in-depth understanding of what diverse participants from different cultural contexts and with different religious and non-religious identities stereotypically associate with different scientist targets. Once the research field has a more nuanced understanding of the

stereotypes associated with scientists, interventions aimed to ensure a more diverse scientific workforce can utilize this understanding and help to break those stereotypic associations between certain characteristics and attributes with scientists.

Perception of science and religion

There is a view that science and religion is inherently in conflict, the conflict narrative. Some research challenges this view (notably Ecklund et al., 2016) and is cited as support in articles on religious scientists balancing faith and work (Conlon, 2024), and support of encouraging educational institutions to incorporate a curriculum with science and religion, such as the Faraday Institute for Science and Religion in Cambridge (Alexander & White, 2024). However, there is also support of this view that science and religion are incompatible, and religion should not be included at all within any scientific discourse (Willemart & Marques, 2024). This narrative exists despite a large portion of the population identifying as religious. In the United States, 83% of the general population claim to be religious, while only 33% of scientists claim to be religious (Pew Research Center, 2009). This discrepancy may be reflective of scientists being unwilling to admit religious identity, or in those who identify as being religious not pursuing a career in the sciences. This research aims to understand the perception of science and scientists to investigate further whether the latter may be accurate. Previous experimental work has indicated that scientists may be viewed differently based on their stated religious identity, as often a scientific identity may be seen as incompatible with a religious identity (Sharp et al., 2022). This has also been evident in data collected more globally. A groundbreaking study investigating the extent to which religious identity related to perceptions of discrimination in the workplace as a scientist indicated that participants of some religious identities were more likely to report perceived discrimination due to their personal religious identity (Scheitle & Ecklund, 2018). Across country contexts, there is also a variation between 30% and 94% of scientists surveyed who claim to be a religious person. This variation highlights the necessity for the current research to consider different country contexts (Ecklund et al., 2016).

Previous investigations into perceptions of combined religious and science identities indicated that certain combinations of scientific and (non)religious identities were perceived to be more 'stereotypical' or 'intuitive' (Sharp et al., 2022). These combinations of religious and science identities were also perceived differently based on the perceiver's own personal stated religious social identity. In general, atheists (and to a lesser extent non-religious) participants tended to view 'religious scientists' as more counter-stereotypical, or less intuitive, than 'atheist scientists'. On the other hand, religious participants never found 'religious scientists' to be more counter-stereotypical, or less intuitive, than 'atheist scientists'. In fact, when there were differences, they went in the other direction: some religious participants found 'atheist scientists' to be more counter-stereotypical than 'religious scientists'. This indicates that personal religious social identity affects how science and religion are perceived and that religious individuals at least have no problem combining the identities of 'religious' and 'scientist' (Sharp et al., 2022). Our research therefore aims to explore not only how participants' own religious and non-religious identities affect their stereotypic perceptions of scientists, but also whether indicating the religious and non-religious identity of the scientists participants were asked to think of, would result in different attributions or stereotypes.

An international approach

Much of the research on religious identity, discrimination and view of scientists has been conducted in the United States. However, different areas of the world have differing religious demographics, views on religion and levels of acceptance in daily life of religion (Pew Research Center,

2017). Therefore, given the gaps in research data, we are limited in the extent to which we can generalize about views of religion and of scientists across different contexts. Sociological research conducted across eight different regions investigating how scientists understand religion in a global context indicates the prevailing view is that science and religion are seen as independent (Ecklund et al., 2016). Issues around science and issues around religion were seen as separate and non-effective upon each other. These regions were chosen based on their variability in religiosity of the general population as well as the variation in levels of science infrastructure. However, recent investigations into perceptions of the relationship between science and religion indicate that there isn't one universally held view (Thigpen et al., 2020). While some patterns emerged within religious groups, the perceptions between religious groups varied. This shows the importance of not only undertaking research on science and religion but also the importance of undertaking research across different global contexts to see which issues are culturally specific and which are cross-culturally consistent.

With this research, we aim to not only understand how scientists are viewed regarding whether they are likely to be religious but also to understand how individuals in different countries view scientists of varying (non-)religious belief. At this point, we would like to note that the research described in this article is part of a much larger multidisciplinary project on public perceptions of the relationship between evolutionary science and religion. While we asked about stereotypical perceptions of scientists in general here, we also asked about perceptions of evolutionary scientists specifically, to disentangle whether there are any significant differences in stereotypical perceptions between 'general' scientists and evolutionary scientists.

The primary goal of this article is to expand our understanding of the public's perception of scientists across wider cultural contexts. We therefore collected data from four different countries: the United Kingdom, Germany, Spain and Argentina. As there is hardly any quantitative data on people's perceptions of scientists, this research was mainly exploratory. Therefore, we did not have specific hypotheses. However, we designed the research so that we could investigate the following: (a) country-level differences in the perceptions, (b) social identity-level differences in perceptions within countries as previous research has shown how religious and non-religious social identities can impact perceptions of scientists (Sharp et al., 2022), (c) differences between perceptions of different types of scientists ('scientist' in general vs 'evolutionary scientist') and (d) differences in perceptions of scientists based on their stated (non-)religious identity. This begins to fill the research gap of perceptions of scientists of varying (non)religious identities within non-Anglophone contexts.

Methods

As noted above, this research is part of a much larger project focusing on social psychological understandings of people's perceptions of the relationship between (evolutionary) science and religion. As such, the questions of interest below were taken from a much larger survey. To reduce participant fatigue within this larger survey, we had to ensure that questions were concise so that all topics of interest could be covered within this larger survey.

Procedure

General method. We used Qualtrics Panels to distribute a large online survey to explore attitudes towards science and religion across the United Kingdom, Germany, Spain and Argentina – see OSF link (Hughes & Sharp, 2023) for full list of questions. The questions of interest for this article are those related to the perception of scientists as described below. Participants were only eligible

if they were over 18 years old and resided in the country of interest. We recruited participants who and identified as religious, atheist or non-religious but not atheist [religious or non-religious in Argentina]. These social identities were chosen based on previous research in the United Kingdom (Leicht et al., 2022; Leicht & Sharp, 2020; Sharp et al., 2022), as well as consultations with research partners in Spain, Argentina and Germany.

Participants first provided informed consent and then answered questions about their views of science and religion, including their views of scientists and views of attitudes that scientists would hold. After completing all questions, participants were debriefed and thanked for their time. Surveys were provided in each country's primary native language, translated by collaborators who are native speakers of each: English, German, Argentinian Spanish and Castilian.

Materials

We measured participants' view of scientists through two different types of questions. First, we had participants do an 'imagination' task, which taps into stereotypes related to physicality and religious belief. They were given these instructions:

Now we would like you to think about **a person in your country who works in the sciences**. Close your eyes. Think about this person. Pick the first image that comes to your mind. This could be a real person, a fictional character from a book, movie or tv show, or someone you have just made up.

They then answered several questions about the person they had imagined. Five of them were of interest to the current research. Three were yes/no questions relating to whether the scientist was religious, spiritual or educated in their home country. One was about the scientists' gender identity with the following options: Man, Woman and Other (please specify). The final one was asking about the success of the scientists rated on a scale from 0 (*Very Unsuccessful*) to 10 (*Very Successful*). We also asked the same questions about **'a person in your country who studies evolution'**.

Next, we asked participants to rate perceptions about trustworthiness, intelligence and conflict/compatibility of evolutionary science and religion of scientist targets, see instructions below. Participants were asked to make these ratings for several scientist targets that specified a range of (non-)religious identities: religious scientist, scientist, spiritual scientist, atheist scientist and non-religious scientist. They also then rated targets with those specific religious and non-religious identities for a scientist who studies evolution:

Please indicate your feelings towards members of the following groups, from 0 (completely untrustworthy) [very unintelligent] to 10 (completely trustworthy) [very intelligent].

Please indicate the extent to which you think members of the following groups see evolutionary science and religious and/or spiritual viewpoints as being in conflict or compatible from 0 (complete conflict) to 10 (complete compatibility).

All data and materials (including the full list of items) can be found at the following link: https://osf.io/2v6cs/?view_only=17b0f189cb3448c98886b0015c76d4e0.

Results

We will split the results into the following sections: (1) general view of scientists [demographic questions from 'imagination' task], (2) perceptions of scientist and evolutionary scientist targets [demographic questions from 'imagination' task] and (3) perceptions of scientists of differing

Table 1. View of scientists by country and religious identity.

		Gender		Religious		Spiritual		Educated in home country		Rated success
		Male	Female	Yes	No	Yes	No	Yes	No	
UK	Religious	66%	34%	45%	55%	40%	60%	88%	12%	7.75
	Non-religious	66%	30%	5%	95%	20%	80%	91%	9%	7.87
	Atheist	67%	30%	12%	88%	18%	82%	90%	10%	7.87
Germany	Religious	70%	30%	70%	30%	31%	69%	91%	9%	7.27
	Non-religious	66%	33%	8%	92%	17%	83%	88%	12%	7.32
	Atheist	59%	40%	13%	87%	20%	80%	88%	12%	7.40
Spain	Religious	67%	32%	70%	30%	64%	36%	90%	10%	7.16
	Non-religious	63%	36%	6%	94%	32%	68%	87%	13%	7.31
	Atheist	65%	34%	6%	94%	25%	75%	87%	13%	6.84
Argentina	Religious	67%	31%	51%	49%	59%	41%	91%	9%	8.01
	Non-religious	63%	35%	18%	82%	50%	50%	91%	8%	7.69

Success measured on 10-point scale; we have reported the mean.
Percentages in bold indicate majority answers.

(non-)religious identities [Trustworthiness, Intelligence, and Perception of Conflict/Compatibility of Evolutionary Science and Religion]. We applied Bonferroni correction to account for the multiple tests within the analyses for each country’s dataset, using an altered alpha level of $p < .006$.

General view of scientists

First, data were explored by examining the frequency of responses to several general demographic questions about scientists: (a) gender, (b) are they religious, (c) are they spiritual, (d) are they educated in your home country and (e) how successful are they. To compare responses more easily, we recoded gender responses as 1 (Or Yes) for Male and 0 (or No) for Female. We initially only viewed responses to these questions about a ‘scientist’. Frequency of responses were explored by participant (non-)religious self-identity. Aggregated results are below separated by country. See Table 1 for breakdown of percentages or mean scores by social identity of participants for all countries.

UK. Regardless of whether the participant identified as religious, non-religious or atheist, most participants viewed a scientist as male, non-religious, non-spiritual, UK educated and successful.

Germany. Unlike the United Kingdom, participants who identified as religious answered slightly differently than participants who identified as non-religious or atheist in terms of the perceived religiosity of the target. Participants who identified as religious viewed a scientist as male, religious, non-spiritual, Germany educated and successful. Participants who identified as non-religious or atheist viewed a scientist as male, non-religious, non-spiritual, Germany educated and successful.

Spain. Similarly, participants who identified as religious answered differently than participants who identified as non-religious or atheist in Spain in terms of the perceived religiosity and spirituality of the target. Participants who identified as religious viewed a scientist as male, religious, spiritual, Spain educated and successful. Participants who identified as non-religious or atheist viewed a scientist as male, non-religious, non-spiritual, Spain educated and successful.

Argentina. Again, we found that perceptions of the scientist's religiosity and spirituality differed based on the religious identity of the perceiver. Participants who identified as religious viewed a scientist as male, religious, spiritual, Argentina educated and successful. Participants who identified as non-religious viewed a scientist as male, non-religious, non-spiritual, Argentina educated and successful.

Perceptions of scientist and evolutionary scientist targets

After exploring frequency of responses to 'scientist', we explored answers to the same five demographic questions as above about a 'scientist' compared to a 'scientist who studies evolution'. To compare these ratings, Yes/No questions for 'scientist' and 'scientist who studies evolution' were transformed into binary variables with 0=No and 1=Yes and computed means of these ratings across our groups for comparison. While scientists and evolutionary scientists were viewed similarly across all countries (correlations between and among ratings of these targets on the different variables tended to be in the range of $r = .7$ and above), we were interested in whether there were any differences in perceptions based on the additional information of studying evolution. We conducted paired-samples *t*-tests on each of the variables of interest, within each country split by participant social identity – pairing ratings of 'scientist' with the same ratings of a 'scientist who studies evolution'.

UK

Religious participants. There were no differences in perceptions of being religious, spiritual, UK educated or rated success of scientists and evolutionary scientists ($ps > .006$).

Non-religious participants. There were no differences in perceptions of being religious, spiritual or UK educated ($ps > .006$). However, scientists ($\bar{x} = 7.87$) were rated as more successful than evolutionary scientists ($\bar{x} = 7.27$), $t(99) = 3.82, p < .001$.

Atheist participants. There were no differences in perceptions of being religious, spiritual or UK educated ($ps > .006$). However, scientists were rated as more successful ($\bar{x} = 7.87$) than evolutionary scientists ($\bar{x} = 7.29$), $t(97) = 3.31, p = .001$.

Germany

Religious participants. There were no differences in perceptions of being religious, spiritual, Germany educated or rated success ($ps > .006$). However, ratings of success trended in the same direction as the United Kingdom with scientists rated ($\bar{x} = 7.27$) as more successful than evolutionary scientists ($\bar{x} = 6.83$).

Non-religious participants. There were no differences in perceptions of being religious, spiritual, Germany educated or rated success ($ps > .006$).

Atheist participants. There were no differences in perceptions of being religious, spiritual, Germany educated or rated success ($ps > .006$).

Spain

Religious participants. There were no differences in perceptions of being religious or spiritual ($ps > .006$), nor for rated success ($p = .034$). However, scientists ($Y = 99, N = 11$) were more likely thought to have been Spain educated than evolutionary scientists ($Y = 89, N = 21$).

Non-religious participants. There were no differences in perceptions of being religious, spiritual, Spain educated or rated success ($ps > .006$).

Atheist participants. There were no differences in perceptions of being religious, spiritual, Spain educated or rated success ($ps > .006$).

Argentina

Religious participants. There were no differences in perceptions of being religious or spiritual ($ps > .006$). However, scientists ($Y = 99$, $N = 10$) were more likely thought to have been Argentina educated than evolutionary scientists ($Y = 93$, $N = 16$); and scientists were rated as more successful ($\bar{x} = 8.01$) than evolutionary scientists ($\bar{x} = 7.48$), $t(108) = 3.39$, $p < .001$.

Non-religious participants. There were no differences in perceptions of being spiritual or rated success ($ps > .006$), nor for perceptions of being religious or rated success ($ps > .006$).

Scientist versus evolutionary scientist. Across all countries of interest, scientists and evolutionary scientists tended to be viewed similarly, with few exceptions, regarding religion, spirituality and whether they were educated in the participants' home countries. An interesting difference emerges when considering the success of a scientist versus an evolutionary scientist. Religious participants tended to view a scientist as more successful than an evolutionary scientist (Germany, Spain and Argentina participants), while occasionally non-religious participants tended to view a scientist as more successful than an evolutionary scientist (the United Kingdom and Spain), and rarely atheist participants viewed a scientist as more successful than an evolutionary scientist (the United Kingdom).

Perception of scientists of differing (non-)religious identities

We measured trustworthiness, intelligence, and perceived conflict/compatibility of evolutionary science and religion within each country across five relevant targets: scientist, religious scientist, spiritual scientist, non-religious scientist and atheist scientist. Within each country, we conducted planned contrasts and pairwise comparisons to investigate any differences in perceptions of the five targets. The interaction between personal religious identification and the scientist target (of varying (non)religious identities) was of most interest to answer the question of whether there is an influence of (non)religious identity on how participants perceive science and scientists within the variation of scientist (non)religious identity. See Table 2 for order of trustworthiness by identity ('1' = most trustworthy) and country.

Trustworthiness. We ran a 3 [2 in Argentina] (Religious ID) $\times$ 5 [Scientist Target] mixed ANOVA with scientist target as within-subjects factor for each country on trustworthiness scores.

UK. The science $\times$ identification interaction was significant, $F(8, 1180) = 15.74$, $p < .001$, $\eta_p^2 = .096$. Within the United Kingdom, overall, all participants rated a 'scientist' target as most trustworthy, followed by 'non-religious scientist', with 'religious scientist' rated the lowest. However, when exploring the order of trust scores by self-identified social religious identity, there appeared an expected in-group bias, but only after an overall bias towards 'scientist' without any stated religious identity.

Table 2. Order of perceived trustworthiness by country and social religious identity.

	Religious	M [SD]	Non-religious	M [SD]	Atheist	M [SD]
UK	1. Scientist ^{4,5}	6.98 [2.13]	1. Non-religious Scientist ^{3,4,5}	6.64 [2.13]	1. Scientist ^{4,5}	7.16 [1.81]
	2. Religious Scientist ⁵	6.90 [1.99]	2. Scientist ^{3,4,5}	6.57 [2.18]	2. Atheist Scientist ^{4,5}	7.04 [1.81]
	3. Spiritual Scientist ⁵	6.85 [1.93]	3. Atheist Scientist ^{1,4,5}	6.34 [2.19]	3. Non-religious Scientist ^{4,5}	7.00 [1.78]
	4. Non-religious Scientist ^{1,5}	6.66 [1.97]	4. Spiritual Scientist ^{1,2,3,5}	5.75 [2.20]	4. Spiritual Scientist ^{1,2,3,5}	5.67 [2.03]
	5. Atheist Scientist ^{1,2,3,4}	6.25 [2.15]	5. Religious Scientist ^{1,2,3,4}	5.26 [2.49]	5. Religious Scientist ^{1,2,3,4}	5.25 [2.40]
Germany	1. Scientist ^{2,3,4,5}	7.06 [1.99]	1. Scientist ^{3,4,5}	7.35 [1.97]	1. Scientist ^{4,5}	7.29 [2.12]
	2. Non-religious Scientist ^{1,4,5}	6.67 [1.79]	2. Non-religious Scientist ^{4,5}	7.29 [2.04]	2. Non-religious Scientist ^{4,5}	7.17 [2.12]
	3. Religious Scientist ^{1,5}	6.33 [2.12]	3. Atheist Scientist ^{1,4,5}	7.00 [1.99]	3. Atheist Scientist ^{4,5}	7.15 [2.23]
	4. Atheist Scientist ^{1,2}	6.17 [1.97]	4. Religious Scientist ^{1,2,3}	5.71 [2.35]	4. Religious Scientist ^{1,2,3}	5.53 [2.61]
	5. Spiritual Scientist ^{1,2,3}	5.96 [2.23]	5. Spiritual Scientist ^{1,2,3}	5.48 [2.38]	5. Spiritual Scientist ^{1,2,3}	5.43 [2.41]
Spain	1. Scientist ^{4,5}	7.41 [1.68]	1. Scientist ^{2,3,4,5}	7.49 [1.78]	1. Scientist ^{4,5}	7.61 [1.77]
	2. Spiritual Scientist ⁵	7.10 [1.87]	2. Non-religious Scientist ^{1,4,5}	7.21 [1.86]	2. Atheist Scientist ^{4,5}	7.60 [1.95]
	3. Religious Scientist ⁵	7.05 [1.93]	3. Atheist Scientist ^{1,5}	7.08 [1.98]	3. Non-religious Scientist ^{4,5}	7.44 [2.06]
	4. Non-religious Scientist ^{1,5}	7.04 [1.92]	4. Spiritual Scientist ^{1,2,5}	6.77 [1.90]	4. Spiritual Scientist ^{1,2,3,5}	6.14 [2.35]
	5. Atheist Scientist ^{1,2,3,4}	6.38 [2.37]	5. Religious Scientist ^{1,2,3,4}	5.62 [2.24]	5. Religious Scientist ^{1,2,3,4}	5.27 [2.48]
Argentina	1. Spiritual Scientist ^{4,5}	7.40 [2.04]	1. Scientist ^{4,5}	7.68 [1.82]		
	2. Scientist ^{4,5}	7.29 [1.89]	2. Non-religious Scientist ⁵	7.51 [1.91]		
	3. Religious Scientist ^{4,5}	7.29 [1.88]	3. Atheist Scientist ⁵	7.27 [2.03]		
	4. Non-religious Scientist ^{1,2,3,5}	6.29 [2.43]	4. Spiritual Scientist ^{1,5}	7.00 [2.18]		
	5. Atheist Scientist ^{1,2,3,4}	5.95 [2.61]	5. Religious Scientist ^{1,2,3,4}	6.13 [2.38]		

Superscripts denote significant pairwise comparisons and with which target(s).

Germany. The science $\times$ identification interaction was significant, $F(8, 1224) = 17.20, p < .001, \eta_p^2 = .041$. Within Germany, there was overall a similar pattern to participants in the United Kingdom, with a ‘scientist’ target rated as most trustworthy, followed by ‘non-religious scientist’, though with ‘spiritual scientist’ as the least trustworthy. When explored by religious social identity within Germany, there was also the expected in-group bias, only after an overall bias towards a ‘scientist’ for most participants (although interestingly, both Religious and Atheist participants rated ‘non-religious’ scientists as more trustworthy than their in-group).

Spain. The science $\times$ identification interaction was significant, $F(8, 1304) = 19.15, p < .001, \eta_p^2 = .105$. Within Spain, there was an overall similar pattern as seen in the United Kingdom and Germany with ‘scientist’ perceived as most trustworthy, followed by ‘non-religious scientist’, with ‘religious scientist’ as the least trustworthy. When examined by social religious identification, we again viewed an in-group bias for each group, after an overall bias towards ‘scientist’ with no stated religious or belief affiliation.

Argentina. The science $\times$ identification interaction was significant, $F(4, 832) = 21.21, p < .001, \eta_p^2 = .093$. Within Argentina, overall, we viewed a slightly different pattern to that of the other three countries. The ‘spiritual scientists’ were rated most trustworthy, followed by ‘scientist’, then ‘religious scientist’, through to ‘atheist scientist’ as the least trustworthy. This may be due to the different participant demographics for this country. For Argentina, we only included two groups, religious and non-religious, and when examined by religious identification we again viewed a slightly different pattern, but only for religious participants – religious participants viewed spiritual scientists as most trustworthy.

Intelligence. As with trustworthiness, we viewed the pattern of order of intelligence rated to five targets: scientist, atheist scientist, non-religious scientist, spiritual scientist and religious scientist. We ran a 3 [2 for Argentina] (Religious ID) $\times$ 5 [Scientist Target] mixed ANOVA with scientist target as within-subjects factor for each country on intelligence scores. With each interaction, we ran pairwise comparisons within each Religious ID. Across all countries, regardless of personal social religious identification, there was a bias towards the ‘scientist’ target as being viewed as most intelligent. All countries, besides Argentina, then viewed ‘non-religious’ and ‘atheist scientist’ targets as next intelligent. We then viewed patterns by country and religious identification. See Table 3 for order of perceived intelligence by religious social identification by country.

UK. The science $\times$ identification interaction was significant, $F(8, 1180) = 17.912, p < .001, \eta_p^2 = .108$. Within the United Kingdom, all participants rated a ‘scientist’ as most intelligent. However, when examined by religious identity, there was an in-group bias as to ratings of intelligence, after the general bias towards a ‘scientist’ target.

Germany. The science $\times$ identification interaction was significant, $F(8, 1224) = 5.068, p < .001, \eta_p^2 = .032$. Within Germany, there was a similar bias towards a ‘scientist’ target being most intelligent, regardless of personal religious identity. However, there was a similar in-group bias as seen in ratings of trustworthiness, including the different rating of religious participants as with the trustworthiness scores shown in the section above.

Spain. The science $\times$ identification interaction was significant, $F(8, 1304) = 12.081, p < .001, \eta_p^2 = .069$. Within Spain, there was a similar pattern of bias towards a ‘scientist’ target regardless

Table 3. Order of perceived intelligence by country and social religious identity.

	Religious	M [SD]	Non-religious	M [SD]	Atheist	M [SD]
UK	1. Scientist ^{4,5}	7.18 [2.10]	1. Scientist ^{3,4,5}	7.18 [2.05]	1. Scientist ^{3,4,5}	7.86 [1.72]
	2. Religious Scientist ⁵	6.98 [1.98]	2. Non-religious Scientist ^{4,5}	7.03 [2.19]	2. Atheist Scientist ^{4,5}	7.56 [1.72]
	3. Spiritual Scientist ⁵	6.91 [2.10]	3. Atheist Scientist ^{1,4,5}	6.81 [2.25]	3. Non-religious Scientist ^{1,4,5}	7.51 [1.69]
	4. Non-religious Scientist ¹	6.69 [2.22]	4. Spiritual Scientist ^{1,2,3,5}	6.20 [2.17]	4. Spiritual Scientist ^{1,2,3,5}	6.01 [2.26]
	5. Atheist Scientist ^{1,2,3}	6.48 [2.29]	5. Religious Scientist ^{1,2,3,4}	5.64 [2.60]	5. Religious Scientist ^{1,2,3,4}	5.64 [2.48]
Germany	1. Scientist ^{2,3,4,5}	7.49 [1.80]	1. Scientist ^{2,3,4,5}	7.63 [1.91]	1. Scientist ^{4,5}	7.73 [1.80]
	2. Non-religious Scientist ^{1,4,5}	6.93 [1.92]	2. Non-religious Scientist ^{1,3,4,5}	7.36 [1.90]	2. Atheist Scientist ^{4,5}	7.66 [1.79]
	3. Religious Scientist ¹	6.69 [2.10]	3. Atheist Scientist ^{1,2,4,5}	6.93 [2.13]	3. Non-religious Scientist ^{4,5}	7.48 [1.88]
	4. Atheist Scientist ^{1,2}	6.64 [1.94]	4. Religious Scientist ^{1,2,3}	6.02 [2.24]	4. Spiritual Scientist ^{1,2,3}	6.43 [2.36]
	5. Spiritual Scientist ^{1,2}	6.38 [2.15]	5. Spiritual Scientist ^{1,2,3}	5.81 [2.27]	5. Religious Scientist ^{1,2,3}	6.24 [2.47]
Spain	1. Scientist ^{4,5}	7.47 [1.81]	1. Scientist ^{3,4,5}	7.89 [1.68]	1. Non-religious Scientist ^{4,5}	7.56 [1.92]
	2. Religious Scientist	7.22 [2.07]	2. Non-religious Scientist ^{3,4,5}	7.68 [1.69]	2. Scientist ^{4,5}	7.50 [2.01]
	3. Spiritual Scientist	7.20 [2.02]	3. Atheist Scientist ^{1,2,5}	7.35 [1.88]	3. Atheist Scientist ^{4,5}	7.41 [2.10]
	4. Non-religious Scientist ¹	7.10 [2.14]	4. Spiritual Scientist ^{1,2,5}	7.07 [1.97]	4. Spiritual Scientist ^{1,2,3,5}	6.53 [2.09]
	5. Atheist Scientist ¹	6.88 [2.36]	5. Religious Scientist ^{1,2,3,4}	6.44 [2.20]	5. Religious Scientist ^{1,2,3,4}	5.61 [2.56]
Argentina	1. Scientist ^{4,5}	7.95 [1.88]	1. Scientist ^{3,4,5}	8.47 [1.91]		
	2. Spiritual Scientist ^{4,5}	7.80 [2.09]	2. Non-religious Scientist ^{3,5}	8.06 [1.74]		
	3. Religious Scientist ^{4,5}	7.71 [2.16]	3. Atheist Scientist ^{1,2,5}	7.72 [2.05]		
	4. Non-religious Scientist ^{1,2,3}	6.87 [2.57]	4. Spiritual Scientist ^{1,5}	7.70 [2.09]		
	5. Atheist Scientist ^{1,2,3}	6.81 [2.70]	5. Religious Scientist ^{1,2,3,4}	6.83 [2.50]		

Superscripts denote significant pairwise comparisons and with which target.

of religious social identity. When we examined this pattern by religious identity, there was a general in-group bias as well.

Argentina. The science $\times$ identification interaction was significant, $F(4, 832) = 14.585, p < .001, \eta_p^2 = .066$. Within Argentina, overall, we viewed a slightly different pattern to that of the other three countries. There was a general bias towards ‘scientist’ being considered the most intelligent, and the pattern following was the same as for trustworthiness. For Argentina, we only included two groups, religious and non-religious, and when examined by religious identification we again viewed a slightly different pattern, but only for religious participants.

Perceptions of conflict/compatibility. For the last of the three traits measured, perceived conflict/compatibility of evolutionary science and religion, participants rated how much they believed specific targets viewed evolutionary science and religion as in conflict or compatible. Across all countries, all participants were asked to rate the amount of conflict/compatibility perceived between science and religion for five targets: scientist, religious scientist, spiritual scientist, atheist scientist and non-religious scientist. We ran a 3 [2 for Argentina] (Religious ID) $\times$ 5 [Scientist Target] mixed ANOVA on perception of conflict/compatibility scores, and all tests conducted with Bonferroni correction. We ran planned pairwise comparisons among religious identities for all countries, as we were interested in the interaction between religious identity and perception of scientists of varying (non-)religious identities. See Table 4 for means and standard deviations of significant pairs by countries. Across all countries, religious participants tended to perceive that scientists see more compatibility between science and religion than atheist or non-religious participants. There were slight differences across targets, but it is possible this perception also reflects the belief of religious participants that there is more compatibility between science and religion.

UK. There was a main effect of the target’s (non-)religious identity, $F(4, 1180) = 13.631, p < .001, \eta_p^2 = .044$, participants’ religious identity, $F(2, 295) = 12.951, p < .001, \eta_p^2 = .081$, but non-significant interaction of stated target identity and personal religious identity, $F(8, 1180) = 1.740, p = .085, \eta_p^2 = .012$. Pairwise comparisons indicate that religious participants rated scientists ($p < .001$), religious scientists ($p < .001$) and spiritual scientists ($p < .001$) as perceiving more compatibility between evolutionary science and religion as compared to non-religious and atheist participants (pairwise $ps > .006$). In other words, non-religious and atheist participants rated scientists as perceiving more conflict between science and religion than religious participants. Pairwise comparisons show no significant differences in ratings of atheist or non-religious scientists among religious identities, $ps > .006$. All participants considered atheist and non-religious scientists to perceive similar levels of conflict/compatibility between evolutionary science and religion regardless of personal religious identity.

Germany. There was a main effect of the target’s (non-)religious identity, $F(4, 1224) = 5.186, p < .001, \eta_p^2 = .017$, but non-significant effect of personal religious identity, $F(2, 306) = 4.068, p = .018, \eta_p^2 = .026$, and non-significant interaction, $F(8, 1224) = 0.674, p = .715, \eta_p^2 = .004$. Pairwise comparisons indicate that religious participants rated only religious scientists ($p = .003$) as perceiving more compatibility between evolutionary science and religion as compared to atheist participants (pairwise $p = .003$). In other words, atheist and non-religious participants rated religious scientists as perceiving more conflict between science and religion than religious participants. Pairwise comparisons show no significant differences in ratings of scientists, spiritual scientists, atheist scientists or non-religious scientists among participant religious identities, $ps > .006$. All participants consid-

Table 4. Perception of conflict/compatibility of science and religion by country and religious identity.

Target						
Country	Participant religious identity	Scientist	Religious scientist	Spiritual scientist	Non-religious scientist	Atheist scientist
UK	Religious	6.10 [2.37] ***	6.25 [2.15] ***	6.17 [2.09] ***	nd	nd
	Non-religious	4.48 [2.63]	4.83 [2.36]	4.88 [2.13]	nd	nd
	Atheist	4.69 [3.00]	4.76 [2.56]	4.99 [2.37]	nd	nd
Germany	Religious	nd	6.07 [2.12] *	nd	nd	nd
	Non-religious	nd	5.08 [2.84]	nd	nd	nd
	Atheist	nd	4.93 [2.36]	nd	nd	nd
Spain	Religious	6.59 [2.24] **	6.44 [2.12] ***	6.65 [2.10] ***	6.04 [2.47] **	nd
	Non-religious	5.47 [3.88]	5.02 [2.44]	5.36 [2.44]	4.65 [3.17]	nd
	Atheist	4.70 [3.18]	4.87 [2.59]	5.18 [2.37]	4.57 [3.29]	nd
Argentina	Religious	nd	5.99 [2.62] **	nd	nd	nd
	Non-religious	nd	4.82 [3.17] **	nd	nd	nd

'nd' indicates non-significant difference among groups at $p > .05$.

*Significant at $p < .05$.

**Significant at $p < .01$.

***Significant at $p < .001$.

ered other targets to perceive similar levels of conflict/compatibility between science and religion regardless of personal religious identity.

Spain. There was a main effect of the target's (non-)religious identity, $F(4, 1304) = 6.625$, $p < .001$, $\eta_p^2 = .020$, participants' religious identity, $F(2, 326) = 16.625$, $p < .001$, $\eta_p^2 = .093$, but non-significant interaction, $F(8, 1304) = 1.243$, $p = .270$, $\eta_p^2 = .008$. Pairwise comparisons indicate that religious participants rated scientists ($p < .001$), religious scientists ($p < .001$), spiritual scientists ($p < .001$) and non-religious scientists ($p = .001$) as perceiving more compatibility between evolutionary science and religion than atheist participants. Religious participants rated religious scientists ($p < .001$) and spiritual scientists ($p < .001$) as perceiving more compatibility between evolutionary science and religion than non-religious participants. All participants considered atheist scientists to perceive a similar level of conflict/compatibility of science and religion.

Argentina. There was a main effect of the target's (non-)religious identity, $F(4, 832) = 19.627$, $p < .001$, $\eta_p^2 = .086$, non-significant effect of participants' religious identity, $F(1, 208) = 4.205$, $p = .042$, $\eta_p^2 = .020$, and non-significant interaction, $F(4, 832) = 1.086$, $p = .352$, $\eta_p^2 = .005$. Religious participants rated religious scientists as perceiving more compatibility between science and religion than non-religious participants, $p = .004$. There were no significant differences in these groups' ratings of scientists, spiritual scientists, atheist scientists or non-religious scientists, $ps > .006$.

Discussion

In line with previous research (Ferguson & Lezotte, 2020; McCarthy, 2015; McPherson et al., 2018; Miller et al., 2018), we found an overarching similarity in the view of scientists across cultures, countries and religious identities. However, we also found some diversity in opinions about science and religion and perceptions of whether scientists are religious or not. This may be influenced by social identity and cultural context (Leicht et al., 2022).

Table 5. View of ‘scientist’ by country and religious identity.

Country	Participant religious identity	Male	Spiritual	Religious	Educated in home country	Successful
UK	All	✓	✗	✗	✓	✓
Germany	Religious	✓	✗	✓	✓	✓
	Non-religious and atheist	✓	✗	✗	✓	✓
Spain	Religious	✓	✓	✓	✓	✓
	Non-religious and atheist	✓	✗	✗	✓	✓
Argentina	Religious	✓	✓	✓	✓	✓
	Non-religious	✓	✗	✗	✓	✓

✓ Majority ‘yes’.

✗ Majority ‘no’.

Similarities

Across all countries, regardless of context and religious identity, there are certain top-level similarities in the perception of scientists. Investigation of the frequencies of answers in the ‘imagination’ scenario (where the scientists and evolutionary scientists had no stated religious or non-religious affiliation) indicated that across all sampled contexts, scientists are viewed similarly. All participants, regardless of religious social identity or country, viewed a scientist as male, educated in their home country and generally successful. It is only regarding whether a scientist is viewed as religious or spiritual where we see differences emerging among countries. See Table 5 for overview of scientist descriptive frequencies by country and religious identity.

Within the United Kingdom, regardless of religious identity, a scientist tended to be viewed as non-religious and non-spiritual. In Germany, religious participants tended to view a scientist as religious and non-spiritual, while non-religious and atheist participants viewed a scientist as non-religious and non-spiritual. In Spain, religious participants viewed a scientist as religious and spiritual, while non-religious and atheist participants viewed a scientist as non-religious and non-spiritual. In Argentina, religious participants viewed a scientist as religious and spiritual, and non-religious participants viewed a scientist as non-religious and non-spiritual. These top-level similarities and differences of the demographics of scientists are interesting to explore. The similarities give an indication of overarching views of scientists which transcend cultural context. The differences help us understand views of scientists in different contexts. It could be that context has more of an impact than we think regarding the religiosity and spirituality of scientists and the view of how much religiosity and spirituality are viewed as normal or acceptable as a scientist. For example, in Germany, a scientist was not viewed as spiritual by any of the participants, but religious participants viewed a scientist as being religious. This may relate to in-group bias as discussed below.

In-group bias and egocentrism

It is widely studied and supported within social psychology research on intergroup relations that there is an in-group bias present in most interactions between groups, in which in-group members tend to view their own group more favourably than members of the out-group (Hornsey, 2008; Scheepers & Derks, 2016; Tajfel & Turner, 1986; Verkuyten, 2021). In-group bias is very common and includes behaviours, beliefs and perceptions (Gaertner & Dovidio, 2000). Egocentrism, on the

other hand, is a cognitive bias in which an individual overestimates their own beliefs or perspectives and believes that others share the same beliefs and perspectives, or that theirs is the only point of view (Elkind, 1967; Muuss, 1982). Egocentrism may be exacerbated when considering an in-group member or a member of a similar group. In essence, 'If one is like me, then they must think like me (egocentrism) and if they are like me and think like me, then they are viewed more positively (ingroup bias)'. Within the current research, we included questions that could indicate both egocentrism (those that are like me, think like me) and in-group bias. Egocentrism could relate to the questions about a scientist's religious or spiritual leaning, as well as perceptions of the conflict/compatibility between science and religion. If the participant is religious, they may perceive a scientist to be religious and for a religious scientist to perceive similar views of more compatibility between science and religion. Non-religious and atheist participants may then see the same for their own group norms. The questions that could indicate in-group bias (more positive view of those in the in-group) are the ones about trustworthiness and intelligence. Those who identified as religious rated religious scientists more highly in trustworthiness and intelligence than non-religious or atheist scientists. Those who identified as non-religious rated non-religious scientists more highly in trustworthiness and intelligence than religious scientists. Similarly, those who identified as atheist rated atheist scientists higher in trustworthiness and intelligence than religious scientists. These results indicate both egocentrism and an in-group bias could be related to ratings of scientists within participants' in-group, as compared to one who may be considered a direct out-group.

However, our research indicates a fascinating bias above the expected (and supported) in-group bias. Within the trustworthiness and intelligence ratings, across all countries, when viewing the ratings of different scientific targets there was an in-group bias, with participants rating a target who shared an in-group identity more positively than one who had an out-group identity. However, this in-group bias was overarched by a bias for a scientist with no stated (non-)religious identity. In other words, the bias towards members of the in-group is not as powerful as the bias towards a scientist with no stated religious affiliation whatsoever, including non-religious. It may be that the statement of religious belief, even non-religious belief, alone is enough to lower the target's estimation in a participant's eyes (in effect, 'diluting' the identity of 'scientist'), whether they are aware of this or not. This could have implications for intergroup relations and provide further questions as to whether this is indicative of the general view of science and scientists: that for a scientist, having no stated religious affiliation whatsoever is more positive and accepted than any statement of religious affiliation, including non-religious.

There is a fascinating bias that appears when the target asked about has evidence of any religious or non-religious leaning. The target that was rated as most trustworthy and most intelligent across countries and across most religious identities was the 'scientist' target. It appears that when any information of belief is added, the target is considered less trustworthy and less intelligent than that of a target whose belief is unknown (regardless of religious, non-religious or atheist).

Conflict/compatibility of science and religion

Previous research indicates that religious individuals tend to consider science and religion to be more compatible than non-religious or atheist individuals (Leicht et al., 2022; Longest & Smith, 2011). The current research supports this, as religious participants were more likely to view scientists of varying (non-)religious identities as seeing science and religion as more compatible than did atheist and non-religious participants. However, when explored by country and target [scientist, religious scientist, non-religious scientist and atheist scientist], ratings of viewed conflict/compatibility of science and religion showed an interesting trend and pattern.

As stated earlier, there is an in-group bias evident in the trustworthiness and intelligence ratings of scientist targets. There is also egocentrism evident in the ratings of perceived views on the conflict/compatibility of science and religion. In the United Kingdom, religious participants rated scientists, religious scientists and spiritual scientists as perceiving more compatibility between science and religion than either atheist or non-religious participants. However, there was no difference in ratings of perceived conflict/compatibility of atheist or non-religious scientists by participant (non)religious identity. In Germany, the only significant difference was in participants' ratings of perceived conflict/compatibility of religious scientists – which religious participants rated as more compatible than non-religious or atheist participants. All other targets were rated similarly by participants of different (non)religious identities. In Spain, religious participants rated scientists, religious scientists, spiritual scientists and non-religious scientists as perceiving more compatibility than atheist [all targets] and non-religious [all targets except scientist and non-religious scientist] participants. In Argentina, religious participants rated religious scientists as perceiving more compatibility than non-religious participants. Taken together, there emerges a pattern of religious participants rating religious scientists as perceiving more compatibility between science and religion than non-religious and atheist participants. Alongside this, there is more consistency or agreement among participants about perceptions of how non-religious and atheist scientists view science and religion. All participants tended to view non-religious and atheist scientists similarly in their perceptions of the conflict/compatibility between science and religion. This may reflect an assumption that non-religious people and atheists perceive science and religion as conflicting, and this view is projected onto scientists of those stated religious identities. However, with religious scientists, there is a different pattern with those who identify as religious perceiving a religious scientist as perceiving compatibility between science and religion, and non-religious and atheist participants perceiving the opposite. This may relate to a wider cultural narrative that science and religion are in conflict, or it may reflect a difference in personal view of the conflict between science and religion and projection of this onto others. While previous research indicates religious individuals perceive more compatibility between science and religion than atheist or non-religious (Leicht et al., 2022; Longest & Smith, 2011), we did not measure personal perception of conflict/compatibility between science and religion. This is something which could be investigated further, to aid in understanding of perceptions, biases and accuracy of views around scientists.

Limitations

Our research gives a more diverse understanding of people's perceptions of scientists in global contexts than is usually common in the literature. That said, there are open questions about the generalizability of our findings. For example, all the contexts included in this manuscript were from (at least historically) Christian majority countries. We would not want to generalize to other contexts, and indeed our findings suggest that we should not do this. While we did find some overarching similarities in perceptions of scientists, we also found some important cultural differences which are important to bear in mind when discussing people's perceptions of scientists as well as the relationship between science and religion.

In addition, some of our measures included dichotomous variables which did not allow for a very nuanced understanding of people's perceptions. For example, when coding data for analysis, we used a dichotomous variable for gender which does not reflect the nuance and diversity around gender identity and its relation to science identity. As identity is an important factor in perceptions of the self and others, future research may benefit from asking such questions of wider gender identity as it relates to perception of belonging in the sciences. This can also be applied to wider aspects of identity, including religious, ethnic, generational (age) and political.

Wider implications and future directions

The primary goal of this article is to expand our understanding of the public's perception of scientists across wider cultural contexts relating to religious social identity, which we have begun to do. One concept within social psychology is prototype-matching, in which 'decisions are influenced by overlap in one's self-concept with impressions of a prototypical other' (McPherson et al., 2018). This current research reveals some more information on how a scientist is viewed in general, and what concept of a scientist emerges regarding religious affiliation and religious identity. While the current research indicates a level of egocentrism in perceptions of religious scientists, it may be that religious participants view a religious scientist as perceiving more compatibility between science and religion because they *must* to be successful in the sciences. However, this is conjecture and something that may be studied further: do religious participants view religious scientists as perceiving more compatibility because they are religious and in the sciences, but science and religion as topics are incompatible; or is the nature of the relationship between science and religion one of compatibility? Either way, increasing our understanding of perceptions of scientists relating to religious identity and affiliation is an important avenue relating to this.

Broadening the perception of who can be a scientist is also not necessarily limited to religious identity and affiliation. Individuals may be part of multiple social groups and consider many identities as part of the self – all of which may relate to view of sciences. For example, might an individual's political affiliation and political identity influence how they see scientists of varying stated or implied political identity? Future research could investigate wider identity contexts and how these relate to views of scientists of varying identities. Would an in-group bias then supersede other biases? Relating to gender and Science, Technology, Engineering, Mathematics, and Medicine (STEMM), is there a way in which perceptions of scientists can be broadened to be more welcoming to those of varying genders. Within the United Kingdom, even school-aged children are subtly influenced to pursue science or not. The choices of General Certificate of Secondary Education (GCSE) and A-levels are 'highly gendered', with females citing higher anxiety around science and a wider range of barriers to learning science than their male peers. These included both lack of confidence and a lack of perceived employment opportunities. This may reflect a view that females do not perceive STEMM employment option as open or prevalent or common as their male peers (The Royal Society, 2019, 2023). The goal of understanding and broadening the perception of who can be a scientist has potential to span multiple identities and encourage diversity among many groups.

Conclusion

This article outlined our multi-country exploration of perceptions of scientists, particularly perceptions relating to religious identity. Exploratory analyses indicated egocentrism and in-group bias in perceptions of scientists' religiosity, spirituality, trustworthiness, intelligence and perceptions of conflict/compatibility of evolutionary science and religion. We also found an overarching bias towards a scientist with no stated religious affiliation, consistent across most of the country contexts. However, scientist identities do not exist in a vacuum – every scientist will have a number of additional social identities. Broadening the stereotypical and prototypical view of a scientist could encourage more diversity in the sciences, relating not only to religious identity but also intersections with gender and/or ethnic identity. With further understanding, we can begin to make this broadening of the view of who can be a scientist more likely to be a reality going forward.

Data availability statement

All data and materials are available at https://osf.io/2v6cs/?view_only=17b0f189cb3448c98886b0015c76d4e0.

Ethical approval

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References

- Alexander, D. R., & White, R. S. (2024). Science profits most when people of faith feel equally welcomed. *Nature*, 630, 305. <https://doi.org/10.1038/d41586-024-01745-7>
- Chambers, D. W. (1983). Stereotypic images of the scientist: The draw-a-scientist test. *Science Education*, 67(2), 255–265.
- Conlon, A. M. (2024). How religious scientists balance work and faith. *Nature*, 629, 957–959. <https://doi.org/10.1038/d41586-024-01471-0>
- Ecklund, E. H., Johnson, D. R., Scheitle, C. P., Matthews, K. R., & Lewis, S. W. (2016). Religion among scientists in international context: A new study of scientists in eight regions. *Socius: Sociological Research for a Dynamic World*, 2, 1–9.
- Elkind, D. (1967). Egocentrism in adolescence. *Child Development*, 38(4), 1025–1034.
- Ferguson, S. L., & Lezotte, S. M. (2020). Exploring the state of science stereotypes: Systematic review and meta-analysis of the Draw-A-Scientist Checklist. *School Science and Mathematics*, 120(1), 55–65. <https://doi.org/10.1111/ssm.12382>
- Finson, K. D., Beaver, J. B., & Cramond, B. L. (1995). Development and field test of a checklist for the draw-a-scientist test. *School Science and Mathematics*, 95(4), 195–205.
- Gaertner, S. L., & Dovidio, J. F. (2000). *Reducing intergroup bias: The common ingroup identity model*. Psychology Press.
- Hogg, M. A. (2007). Uncertainty–identity theory. *Advances in Experimental Social Psychology*, 39, 69–126.
- Hornsey, M. (2008). Social identity theory and self-categorization theory: A historical review. *Social and Personality Psychology Compass*, 2, 204–222.
- Hughes, R. E., & Sharp, C. S. (2023). *Perception of scientists data*. https://osf.io/2v6cs/?view_only=6f64ec673e434fa6aad34e80996d6b30
- Leicht, C., & Sharp, C. A. (2020). Beyond belief systems: Promoting a social identity approach to the study of science and religion. In F. Elsdon-Baker & L. Bernard (Eds.), *Identity in a secular age: Science, religion, and public perceptions* (pp. 111–126). University of Pittsburgh Press.
- Leicht, C., Sharp, C. A., LaBouff, J. P., Zarzeczna, N., & Elsdon-Baker, F. (2022). Content matters: Perceptions of the science-religion relationship. *The International Journal for the Psychology of Religion*, 32(3), 232–255.
- Longest, K. C., & Smith, C. (2011). Conflicting or compatible: Beliefs about religion and science among emerging adults in the United States. *Sociological Forum*, 26(4), 846–869. <https://doi.org/10.1111/j.1573-7861.2011.01287.x>
- McCarthy, D. (2015). Teacher candidates’ perceptions of scientists: Images and attributes. *Educational Review*, 67(4), 389–413.
- McPherson, E., Park, B., & Ito, T. A. (2018). The role of prototype matching in science pursuits: Perceptions of scientists that are inaccurate and diverge from self-perceptions predict reduced interest in a science career. *Personality and Social Psychology Bulletin*, 44(6), 881–898.

- Mead, M., & Métraux, R. (1957). Image of the scientist among high-school students: A pilot study. *Science*, 126(3270), 384–390.
- Memis, E. K., Cakan Akkas, B. N., Ketenoglu Kayabasi, Z. E., Karakus, E., & Filiz, N. (2020). Determining 1st–4th grade elementary school students' perceptions of scientists. *Acta Didactica Napocensia*, 13(2), 316–331.
- Miller, D. I., Nolla, K. M., Eagly, A. H., & Uttal, D. H. (2018). The development of children's gender-science stereotypes: A meta-analysis of 5 decades of U.S. draw-a-scientist studies. *Child Development*, 89(6), 1943–1955.
- Muuss, R. (1982). Social cognition: David Elkind's theory of adolescent egocentrism. *Adolescence*, 17(66), 249–265.
- Özel, M. (2012). Children's images of scientists: Does grade level make a difference? *Educational Sciences: Theory & Practice (Special Issue)*, 12, 3187–3198.
- Pew Research Center. (2009). *Scientists and belief*. <https://www.pewresearch.org/religion/2009/11/05/scientists-and-belief/>
- Pew Research Center. (2017). *The changing global religious landscape*. <https://www.pewresearch.org/religion/2017/04/05/the-changing-global-religious-landscape/>
- The Royal Society. (2019). *Science education tracker 2019*. <https://royalsociety.org/news-resources/projects/science-education-tracker/2019/>
- The Royal Society. (2023). *Science education tracker 2023*. <https://royalsociety.org/news-resources/projects/science-education-tracker/>
- Scheepers, D., & Derks, B. (2016). Revisiting social identity theory from a neuroscience perspective. *Current Opinion in Psychology*, 11, 74–78.
- Scheitle, C. P., & Ecklund, E. H. (2018). Perceptions of religious discrimination among U.S. scientists. *Journal for the Scientific Study of Religion*, 57(1), 139–155.
- Sharp, C. A., Leicht, C., Rios, K., Zarieczna, N., & Elsdon-Baker, F. (2022). Religious diversity in science: Stereotypical and counter-stereotypical social identities. *Group Processes & Intergroup Relations*, 25, 1836–1860.
- Tajfel, H., & Turner, J. (1986). The social identity theory of intergroup behavior. In S. Worchel & W. Austin (Eds.), *Psychology of intergroup relations* (pp. 7–24). Nelson-Hall.
- Thigpen, C. L., Johnson, C., & Funk, C. (2020). On the intersection of science and religion. *Pew Research Centre*. <https://www.pewresearch.org/science/2020/08/26/on-the-intersection-of-science-and-religion/>
- Tintori, A. (2017). The most common stereotypes about science and scientists: What scholars know. In A. Tintori & R. Palomba (Eds.), *Turn on the light on science: A research-based guide to break down popular stereotypes about science and scientists* (pp. 1–18). Ubiquity Press.
- Türkmen, H. (2008). Turkish primary students' perceptions about scientist and what factors affecting the image of the scientists. *Eurasia Journal of Mathematics, Science & Technology Education*, 4(1), 55–61.
- Verkuyten, M. (2021). Group identity and ingroup bias: The social identity approach. *Human Development*, 65(5–6), 311–324.
- Willemart, R. H., & Marques, A. C. (2024). Science and religion have profound differences – They should be kept apart. *Nature*, 630, 305. <https://doi.org/10.1038/d41586-024-01744-8>