Religion Does Not Prevent Trust in Science, but Non-Religious People Think it Does

Joshua Conrad Jackson^{1,2*}, Katarzyna Jasko³, Samantha Abrams¹, Tyler Atkinson⁴, Evan Balkcom⁴, Arie Kruglanski⁵, Kurt Gray¹, and Jamin Halberstadt⁴

1. Department of Psychology, University of North Carolina at Chapel Hill
2. Kellogg School of Management, Northwestern University
3. Institute of Psychology, Jagiellonian University
4. Department of Psychology, University of Otago
5. Department of Psychology, University of Maryland

*Corresponding author:

Email: joshcj@live.unc.edu

Phone: 202-821-7436

Classification: Psychological and Cognitive Sciences

Keywords: Religion; Science; Cross-Cultural; Goal Systems Theory

Author Contributions: JCJ, KJ, and JH conceptualized the research. JCJ, KJ, and TA performed the research. JCJ, KJ, and SA analysed the studies. JCJ, KJ, SA, EB, and JH wrote the manuscript. AK and KG provided important revisions to the manuscript.

Funding Statement: This research was supported by a grant from the Templeton Foundation and Issachar Fund to JCJ and KG.

Abstract

How does religion influence attitudes towards science? Some theories claim that religion encourages conflict with science by narrowing people's worldviews, whereas others claim that religious people combine insights from science and religion to understand the world. We reconcile these perspectives with a new model of science and religion, drawn from goal systems theory, that makes two key hypotheses. Studies 1-2 test a compatibility hypothesis that religious people should perceive less conflict between science and religion than non-religious people. We support this hypothesis in the U.S. (Study 1) and in a 38-nation sample (Study 2). Studies 3-6 test an instrumentality hypothesis that religious people should view science and religion as each moderately instrumental, whereas non-religious people should view science as extremely instrumental and religion as not at all instrumental. We support this hypothesis by analyzing how people explain extraordinary phenomena (Study 3), answer "life's big questions" (Study 4), and avoid infection during COVID-19 (Study 5). Our studies also show that non-religious people underestimate religious people's trust in science, and view science and religion as more mutually exclusive than do religious people (Study 6). These studies challenge claims about tensions between religion and science, and reconcile seemingly contradictory findings from past research. Religious people may be more open to science than non-religious people think.

Statement of Significance

Many social commentators suggest that religion makes people more narrow-minded and unwilling to consider scientific perspectives. In contrast to this claim, we find that religious people view science and religion as more compatible than do non-religious people. We also find that non-religious people misperceive religious people, seeing them as less trusting of science than religious people self-report. These predictions suggest that religious students may be more open to scientific ideas in classrooms than non-religious instructors think they are, and that non-religious social scientists may underestimate religious people's favourability towards science. Moreover, using spirituality as a means of coping (e.g., with a pandemic) need not interfere with someone's willingness to use scientific solutions (e.g., washing hands to avoid infection).

Humans are motivated to understand the world. For thousands of years, we have grappled with questions that are both abstract (life after death, our role in the universe) and concrete (the next day's weather, the best way to respond to a pandemic). Humans have historically used religion to answer these questions (1), but the scientific revolution has provided us with new secular sources of knowledge, and we now have unprecedented access both to scientific research and religious doctrine. How do people adjudicate between these worldviews?

One popular account is that religious people use their religious beliefs as their primary means of explaining the world, whereas non-religious people rely on science. The "New Atheism" movement has advanced this account, arguing that science and religion are inherently at odds, and that religious belief fundamentally undermines trust in science (2,3). In the essay "Science Must Destroy Religion," Sam Harris wrote that "the success of science often comes at the expense of religious dogma; the maintenance of religious dogma always comes at the expense of science" (4). Others have suggested that religious belief systems are "memplexes" that narrow people's worldviews so that they can replicate at the expense of other memes (2,5). These conflict-based accounts typically cite two lines of evidence. First, a pair of experimental studies published in 2009 found that experimentally increasing belief in God decreased implicit evaluations of science and vice versa (6). Second, several surveys have found that religious people often self-report lower trust in science than non-religious people, a link that is particularly strong in the United States (7,8) but also generalizes to countries around the globe (9). A similar study during the COVID-19 pandemic found that highly religious regions of the United States were more likely than non-religious regions to violate science-based shelter-in-place directives (10).

However, descriptive studies have documented cases in which religious people are surprisingly favourable towards science (11). Cross-cultural field studies have found that religious people from non-Western societies often endorse scientific as well as religious explanations of illness and death (12,13). Another study found that religious individuals appeared to complement (rather than replace) supernatural explanations with science-based explanations in their explanations for life after death, the weather, and a variety of other phenomena (14). Developmental research has shown that children are willing to rely on science and religion as co-existing sources of knowledge (15,16). In conjunction with the oft-cited conflict account above, this evidence creates a puzzle: How can religious people simultaneously appear to trust science less than non-religious people while frequently and willingly using scientific findings to explain the world and complement spiritual insights?

Here we address this puzzle of science and religion using two insights from goal systems theory, a theory of how humans can use multiple means to accomplish goals (17). We start with the premise that religious people have both religion and science at their disposal as sources of knowledge, whereas non-religious people do not use religion. Goal systems theory predicts that non-religious people, who have committed to science, should more be motivated to perceive conflict between science and religion than religious people, who are less committed to a single source of knowledge (18). This dynamic supports a *compatibility hypothesis* in which religious people should perceive less conflict between science and religion than non-religious people. If confirmed, the compatibility hypothesis would explain why religious people complement religion and science in their explanations of the world (12,14), whereas many atheists claim that religion and science are irreconcilable (4).

A second insight comes from goal systems theory's principle of equifinality, which describes how people using multiple means (e.g., religion, science) of accomplishing a goal (e.g.,

knowledge) will perceive each means as less instrumental than if they only relied on one (19). For example, someone who uses both dieting and exercise to lose weight may view each activity as less effective than if they only relied on dieting. This “more is less” dynamic means that people with multiple means of accomplishing a goal can feel less dependent on any particular strategy (20,21). The principle of equifinality supports an *instrumentality hypothesis* of science and religion, where religious people view science and religion as equally and moderately instrumental whereas non-religious people view science as extremely instrumental and religion as not at all instrumental. If supported, the instrumentality hypothesis would explain why religious people often report lower trust in science than non-religious people (7–9), despite not viewing any conflict between science and religion.

This motivationally-enriched model reconciles past findings on the relationship between science and religion while also making new predictions. For example, it is consistent with past findings that religious people perceive science as less instrumental than non-religious people (8,9), but it also predicts that religious people should view religion as less instrumental than non-religious people view science. This model is consistent with evidence that increasing conviction in religion can lead to decreased conviction in science (6), but it suggests that only non-religious people should view science and religion as hydraulic and mutually exclusive. Differences in how religious and non-religious people view the relationship between religion and science may also lead these groups to misperceive one another (22). For example, if non-religious people view religion and science as irreconcilable, they may often underestimate religious people’s openness to science.

This model also suggests that there is nothing especially dogmatic about religion, as claimed by conflict-based accounts of religion and science (2,5). Ironically, it may actually be non-religious people who have a more dogmatic worldview, assuming that science and religion are incompatible and that trust in one worldview undermines trust in the other. Consistent with this possibility, most studies showing that people perceive compatibility between religion and science have sampled from highly religious non-Western communities (6), whereas studies showing conflict between religion and science have largely sampled from secular populations such as universities in Western countries (11–13).

We present 6 studies ($\sum N = 12,113$) that support our model and find key differences in how religious and non-religious people view the relationship between science and religion. Studies 1-2 test the compatibility hypothesis, showing that religious conviction negatively correlates with perceived religion-science conflict. Study 1 supports this claim in a representative sample of religious and non-religious Americans, and Study 2 provides evidence using a sample of religious individuals from 38 countries from around the world. Studies 3-6 next test the instrumentality hypothesis that religious people view science and religion as equally and moderately instrumental sources of knowledge whereas non-religious people view science as highly instrumental and religion as not at all instrumental. We show this dynamic in people’s interpretation of unexplained phenomena (Study 3), life’s big questions (Study 4), and ways of avoiding COVID-19 infection (Study 5). Key studies also show that non-religious people systematically underestimate religious people’s perception that science and religion are compatible (Study 2) and their perception of science’s instrumentality (Study 6).

Results

Study 1

Do science and religion conflict? Study 1 tested our compatibility hypothesis that religious people should perceive less conflict between science and religion than non-religious people using a sample of 2,002 Americans recruited in a 2002 Pew Research Centre Telephone Survey. Our analysis focused on participants' "yes" or "no" responses to the question "In your opinion, generally do you think science conflicts with religion." The survey also measured demographic information including sex (dummy-coded with men as "1" and women as "0"), age, subjective wealth, and political party membership.

A logistic regression revealed that, as predicted, religious people perceived less conflict between science and religion than non-religious people, $b = -0.86$, $SE = 0.13$, $t(1897) = -7.04$, $p < .001$, 95% CIs [-1.11, -0.62]. In total, 73% of non-religious people believed that science and religion conflicted, whereas 53% of religious people believed that they conflicted. This association replicated controlling for demographic information, including age, gender, political identification, and income bracket. These results are displayed in Table 1.

Table 1. Correlates of Viewing Science and Religion as Conflicting in Study 1

Factor	b (SE)	OR	z	p	LLCI	ULCI
Religious	-.76 (.13)	.47	-5.92	< .001	-1.02	-.51
Age	-.007 (.003)	.99	-2.92	.004	-.01	-.002
Sex	-.21 (.10)	.81	-2.16	.03	-.40	-.02
Income	-.06 (.02)	.95	-3.25	.001	-.09	-.02
Democrat	.71 (.13)	2.04	5.45	< .001	.46	.97
Other Political Party	.45 (.12)	1.57	3.62	< .001	.20	.69

Note. "Democrat" and "Other Political Party" are contrasted against the category of "Republican."

To confirm that the effect of religion was not influenced by the telephone format or the surveyor (Pew Research Centre), we replicated the findings in two surveys hosted on Amazon Mechanical Turk (see SI). These findings support our hypothesis that religious people perceive less conflict between religion and science than non-religious people.

Study 2

Our next study sampled from 8,027 religious people from 38 nations to test whether stronger religious conviction is associated with more or less belief that science and religion conflict. According to conflict-based accounts of religion and science, religious belief narrows people's worldviews and leads them to eschew science (2). Here we make the opposite prediction. Our compatibility hypothesis predicts that in a sample of people who identify as religious, those who self-report stronger religious conviction should be less likely to believe that science and religion conflict.

Our survey featured participants from 10 major world religions: Christianity ($n = 4,627$), Islam ($n = 1,567$), Hinduism ($n = 437$), Buddhism ($n = 854$), Judaism ($n = 224$), Taoism ($n = 203$), Shintoism ($n = 77$), Jainism ($n = 27$), Sikhism ($n = 10$), and Bahai ($n = 1$). All participants indicated their religious conviction on a 1 ("Not religious at all") to 7 ("Highly religious") scale, and also indicated their beliefs about conflict between science and religion using a scale where participants rated their 1 ("Strongly Disagree") to 7 ("Strongly Agree") agreement with the statements "Science and religion are compatible" (R), "Science and religion are fundamentally in conflict," and "Science and religion can be used together" (R).

Our main hypothesis was that religious conviction would be negatively associated with perceived conflict between science and religion, and that this relationship would be independent of demographic characteristics such as nationality, age, gender, religion, and socioeconomic status. We also examined whether non-religious people would overestimate the relationship between religious conviction and perceived conflict between science and religion. To evaluate non-religious people's perceptions, we asked a second sample of participants who identified as non-religious ($n = 203$) to estimate how people who varied across seven levels of religious conviction would endorse the statement "Science and religion are compatible." By using the same item and scale as our international survey, we could directly contrast religious people's responses to this statement with non-religious people's assumptions about how religious people would respond to the statement.

We tested our first hypothesis using a series of multilevel regression with individuals nested in countries. This approach allowed us to estimate the zero-order association between religious conviction and perception of conflict between religion and science (Model 1), and control for demographic covariates (Model 2). These models revealed support for our hypothesis. Religious conviction was negatively associated with perceived conflict between religion and science, an effect that replicated even when controlling for demographic covariates and religious differences. Table 2 displays results from each of the models.

Table 2. Correlates of Viewing Science and Religion as Conflicting in Study 2

	Science and Religion Conflict	
	Estimate (95% CIs)	
	(1)	(2)
Constant	3.82** (3.59, 4.06)	5.38** (4.97, 5.80)
Religious Conviction	-0.06** (-0.08, -0.04)	-0.10** (-0.13, -0.08)
Age		-0.02** (-0.02, -0.01)
Male		0.04 (-0.29, 0.37)
Female		0.10 (-0.23, 0.43)
Education		-0.28** (-0.35, -0.20)
Social Ranking		-0.01 (-0.02, 0.01)
Politics		-0.01 (-0.02, 0.01)
Islam		-0.98** (-1.12, -0.85)
Hinduism		-0.51** (-0.73, -0.28)
Judaism		-0.62** (-0.96, -0.29)
Buddhism		-0.01 (-0.17, 0.14)
Bahai		-1.21 (-4.01, 1.58)
Shintoism		-0.19 (-0.54, 0.17)
Jainism		-0.24 (-0.79, 0.32)
Taoism		-0.005 (-0.26, 0.25)
Observations	8,027	8,027
Log Likelihood	-14,447.11	-14,290.04
Akaike Inf. Crit.	28,902.22	28,616.09
Bayesian Inf. Crit.	28,930.18	28,741.92

Note. * = $p < .05$, ** = $p < .001$. "Male" and "Female" are contrasted against the survey's other gender categories.

We also decomposed the effect of religious conviction on perceived conflict between science and religion by country. There was some variability in the effect size, but 27 of 38 nations showed a negative association, and the association was not positive and significant in any of the countries in our analysis. Figure 1 displays the association and 95% confidence intervals broken down by country. When we used centering to decompose these associations into within-country and between-country effects, we found that the association was significant at both levels of analysis but appeared slightly stronger at the individual level.

Figure 1. The standardized association between religious conviction and perceived conflict between science and religion across countries. Node size reflects sample size, and confidence intervals represent 95% confidence intervals.

Could non-religious people have guessed at the association between religious conviction and perceived religion-science conflict? A multilevel multiple regression mirroring Model 1 of Table 2 found that non-religious participants predicted a non-significant positive association between religious conviction and perceived religion-science conflict, $b = 0.02$, $SE = 0.02$, $t(1217) = .69$, $p = .49$, 95% CIs [-0.03, 0.06]. Examining the confidence intervals of this regression model suggested that non-religious people's estimation of the slope between religious conviction and perceived religion-science conflict, 95% CIs [-0.03, 0.06], was

significantly more positive than the actual relationship, 95% *CI*s [-0.54, -0.33]. Non-religious people also predicted a significantly higher mean level of perceived religion-science conflict among religious people, $M = 4.45$, 95% *CI*s [4.35, 4.54], than religious people self-reported, $M = 3.39$, 95% *CI*s [3.35, 3.42]. These effects are visually displayed in Figure 2.

Figure 2. The association between religious conviction and perception that science and religion conflict as self-reported by religious individuals around the world (left) and predicted by non-religious individuals (right). Non-religious people overestimated the mean perception among religious people that religion and science conflict, and also misperceived the slope between religious conviction and perceptions that science and religion conflict.

In sum, religious people with greater self-reported conviction perceive less conflict between religion and science than religious people with less conviction. This relationship contradicts conflict-based models that claim religious belief prevents trust in science and narrows people's worldviews. Indeed, religious individuals perceived less conflict between religion and science than non-religious people thought they would, and the relationship between religious conviction and perceived religion-science conflict was more negative than non-religious people estimated. These findings support our compatibility hypothesis and show that religious individuals are more open to science than non-religious people think they are.

Studies 3-5 next tested our instrumentality hypothesis in the context of explaining extraordinary phenomena (Study 3), answering life's "big questions" (Study 4), and managing the COVID-19 pandemic (Study 5). In all studies, we predicted that religious people would view science and religion as moderately instrumental, whereas non-religious people would view science as extremely instrumental and religion as not at all instrumental.

Study 3

In Study 3, we developed a measure of how people explain extraordinary events. Participants ($n = 1,173$; 881 religious, 335 non-religious) were presented with a set of vignettes depicting "extraordinary" phenomena. For example, one vignette described a fortune teller who predicted an unexpected job offer, and another depicted a ghost sighting (see "Methods" for the vignettes). Participants were asked to rate each item in terms of whether (a) science and

(b) religion could explain each one, using a 1 (“Definitely Cannot Explain”) to 7 (“Definitely Can Explain”) scale. We hypothesized that religious people would view science and religion as similarly and moderately instrumental for explaining these events, whereas non-religious people would see science as extremely instrumental and religion as not at all instrumental.

We fit a multi-level model to test our prediction. This model revealed a significant religious belief $\times$ strategy (i.e. religion vs. science) interaction, $b = 4.20$, $SE = 0.23$, $t(968) = 18.06$, $p < .001$, 95% CIs [3.75, 4.66]. Non-religious people viewed science as better able to explain extraordinary phenomena than religious people, $b = 1.77$, $SE = 0.15$, $t(971) = 11.92$, $p < .001$, 95% CIs [1.48, 2.06], whereas religious people viewed religion as better able to explain extraordinary events than non-religious people, $b = 2.44$, $SE = 0.14$, $t(967) = 16.96$, $p < .001$, 95% CIs [2.15, 2.72].

Examining the intercepts of these interactive models supported our hypothesis. Whereas non-religious people rated science’s explanatory power as extremely high ($M = 6.40$, $SE = 0.12$) and religion’s explanatory power as very low ($M = 2.08$, $SE = 0.12$), religious people rated science ($M = 4.63$, $SE = 0.08$) and religion ($M = 4.51$, $SE = 0.08$) strategies as both moderately capable of explaining extraordinary phenomena, and not significantly different from one another, $b = 0.12$, $SE = 0.13$, $t(970) = 0.94$, $p = .35$, 95% CIs [-0.37, 0.13]. Religious people also viewed religion as far less instrumental than non-religious people viewed science. These effects are displayed in Figure 3.

Figure 3. Religious and non-religious people’s ratings of how effectively science and religion could explain extraordinary phenomena.

To ensure that these effects were not driven by our “extraordinary phenomena” paradigm, we also replicated the analyses in two supplemental studies (see SI). In Supplemental Study 1 participants rated the extent that science and religion were “effective sources” of knowledge; in Supplemental Study 2 they rated the extent to which they relied on science and God “when they do not know what to think about something.” These studies showed that, regardless of how perceived instrumentality is operationalized, religious people rated science and religion as moderately and similarly instrumental whereas non-religious people rate science as highly instrumental and religion as not at all instrumental.

Study 4

Studies 1-2 showed that religious people perceived less conflict between science and religion than non-religious people, and Study 3 showed that religious people perceived science and religion as equally and moderately instrumental sources of knowledge. We explain these findings using goal systems theory, but an alternative explanation is that religious people view religion and science as highly instrumental but applicable to different kinds of questions. Indeed, one theory of science and religion is that religion is best suited to answer ultimate “why” questions whereas science is best suited to answer mechanistic “how” questions (23). Study 4 ensured that our findings were independent of this “how” vs. “why” dynamic using a paradigm where participants used science and religion to answer “life’s big questions.” We predicted that our findings from Study 3 would replicate regardless of whether participants answered these questions from an ultimate or a mechanistic framing.

We recruited 209 participants (54 religious, 138 non-religious, 17 “undecided” who were not analysed) for a lab-based study in New Zealand, in which they viewed a series of questions about six meaningful and controversial topics: the universe, human existence, consciousness, religion, death, and suicide. Participants in the “how” condition were asked how each of the six phenomena work or came into existence (e.g., “How did the universe come to exist? What was the cause?”), while participants in the “why” condition were asked why each phenomenon exists (e.g., “Why did the universe come to exist? What was the purpose?”). Before providing their own answers to each question, participants could choose to consult real answers—which were compiled prior to the study—provided by a religious expert (the University of Otago Chaplain), and/or a scientist (a colleague who holds PhDs in both Physics and Psychology). Participants also indicated the extent to which they relied on each of the sources of information when providing their own answers on a scale from 0 (“I did not rely on this source at all”) to 4 (“I relied on this source completely”).

We tested our prediction with two multi-level models. Our first model, which analyzed the sources that participants clicked, found a significant interaction between religiosity and information source, $b = 2.17$, $SE = 0.08$, $t = 7.77$, $p < .001$, 95% CI s [1.62, 2.72]. Compared to non-religious people—religious participants were significantly more likely to consult the religious source, $b = 1.55$, $SE = 0.33$, $t = 4.72$, $p < .001$, 95% CI s [0.91, 2.20], and were non-significantly less likely to consult the science source, $b = -0.62$, $SE = 0.34$, $t = -1.83$, $p = .07$, 95% CI s [-1.30, .05]. As we predicted, religious people were equally likely to consult the religious and non-religious sources, $b = -0.05$, $SE = 0.23$, $t = -0.23$, $p = .82$, 95% CI s [-0.51, 0.40], whereas non-religious people were much less likely to consult the religious source than the scientific source, $b = -2.22$, $SE = 0.16$, $t = -14.08$, $p < .001$, 95% CI s [-2.54, -1.92].

We also found a significant interaction between religiosity and information source on ratings of influence, $b = 1.37$, $SE = 0.10$, $t = 13.83$, $p < .001$, 95% CI s [1.18, 1.56]. Religious participants reported greater reliance on religious sources, $b = 0.93$, $SE = 0.14$, $t = 6.60$, $p < .001$, 95% CI s [0.66, 1.21], and less reliance on scientific sources, $b = -0.44$, $SE = 0.14$, $t = -3.17$, $p = .002$, 95% CI s [-0.71, -0.17], than non-religious participants. Consistent with our hypothesis, religious participants reported moderate influence from both religion and science, reporting slightly higher influence from the scientific source, $b = -0.16$, $SE = 0.08$, $t = -2.02$, $p = .04$, 95% CI s [-0.32, -0.005]. Non-religious people, on the other hand, reported far more higher influence from the scientific source, $b = -1.53$, $SE = 0.06$, $t = -27.18$, $p < .001$, 95% CI s [-1.65, -1.42]. These results are displayed in Figure 4.

Figure 4. Religious and non-religious people's likelihood of consulting (left) science sources and religious sources, and their self-reported influence (right) from these sources in Study 4.

Finally, we examined whether these patterns changed depending on whether participants answered causal ("how?") or functional ("why?") question. A three way interaction, $b = -1.00$, $SE = 0.19$, $t = 5.24$, $p < .001$, 95% CIs [0.63, 1.37], indicated that, while there was a significant source by religiosity interaction in both conditions, the interaction was larger for participants in the "how" condition ($b = 1.89$, $p < .001$) than for participants in the "why" condition ($b = 0.89$, $p < .001$). This was mostly because, in the "how" condition, religious people rated science as slightly more influential than religion ($b = 0.28$, $p = .007$) whereas they rated the sources as similarly influential ($p = .87$) in the "why" condition. In both conditions, however, religious people rated religion as more influential than did non-religious people, and rated science and religion as closer together in their influence than did non-religious people, in support of our predictions.

Study 5

Study 5 applied our studies' insights to responses to the COVID-19 pandemic. We conducted this study in early April of 2020, when the pandemic was still in its early stages. We predicted that religious people would see science-based and faith-based means of avoiding COVID-19 as each moderately effective whereas non-religious people would view only science-based means of avoiding COVID-19 as effective. We viewed this test as important because some papers have already used regional data to suggest that religion has made communities more resistant to mandates during COVID-19 (10).

We recruited 401 participants (271 religious, 129 non-religious). Participants evaluated three science-based strategies for avoiding COVID-19 included (a) Frequently washing hands for 20+ seconds, (b) social distancing (standing 6 feet away in social interactions), and (c) avoiding large groups of people (10+). The three faith-based strategies included (a) Prayer, (b) Reading scripture, and (c) Attending virtual religious gatherings and services. For each measure, participants reported their perceived instrumentality of science-based and faith-based strategies for avoiding COVID-19 ("I believe this strategy is effective to avoid COVID-19"), and their self-reported engagement in these strategies ("I am using this strategy to avoid COVID-19").

A multi-level regression found a significant religious belief $\times$ strategy (i.e. religious vs. scientific) interaction, $b = 2.91$, $SE = 0.21$, $t(398) = 13.74$, $p < .001$, 95% CIs [2.49, 3.32], such that non-religious people viewed science-based strategies as more effective than religious people, $b = 0.35$, $SE = 0.12$, $t(404) = 3.01$, $p = .003$, 95% CIs [0.12, 0.57], whereas religious people viewed religion-based strategies as more effective than non-religious people, $b = 2.56$, $SE = 0.18$, $t(405) = -14.52$, $p < .001$, 95% CIs [2.22, 2.91]. The same interactive pattern replicated for self-reported engagement, $b = 3.31$, $SE = 0.21$, $t(398) = 15.50$, $p < .001$, 95% CIs [2.89, 3.72], such that non-religious people viewed science-based strategies as more effective than religious people, $b = 0.26$, $SE = 0.11$, $t(399) = 2.30$, $p = .02$, 95% CIs [0.04, 0.49], whereas religious people viewed religion-based strategies as more effective than non-religious people, $b = 3.04$, $SE = 0.18$, $t(400) = 17.08$, $p < .001$, 95% CIs [2.70, 3.40].

Examining the intercepts of these interactive models revealed support for our hypothesis. Whereas non-religious people rated science-based strategies as extremely effective ($M = 6.45$, $SE = 0.09$) and faith-based strategies as not at all effective ($M = 2.03$, $SE = 0.14$), religious people rated science-based ($M = 6.11$, $SE = 0.06$) and faith-based ($M = 4.59$, $SE = 0.10$) strategies as both effective, and actually rated science-based measures as more effective than faith-based measures, indicating a high likelihood of following these strategies. This pattern was nearly identical for self-reported engagement (see Figure 5). Both religious and non-religious people both agreed that science-based strategies were effective, with ratings of approximate 6 on a 7-point scale.

Figure 5. Participants' ratings of instrumentality (left) and self-reported engagement (right) in faith-based and science-based strategies for avoiding COVID-19 in Study 5.

These findings align with our results from Studies 3-4. Each study suggests that religious people view science as moderately and similarly instrumental whereas non-religious people view science as highly instrumental and religion as not at all instrumental.

Study 6

In Study 2, we showed that non-religious people underestimated religious people's beliefs that science and religion are compatible. Study 6 used a similar design to test whether non-religious people could predict religious people's ratings of science's and religion's instrumentality. Would a sample of non-religious people correctly guess that religious people, on average, perceive religion and science as moderately and similarly instrumental? In Study

6, we predicted that non-religious people would perceive religious people as more reliant on religion and less reliant on science than religious people self-report. We also measured how religious people perceive non-religious people. Since religious people are motivated to reconcile religion and science (our compatibility hypothesis), we predicted that they should perceive non-religious people as more favourable towards religion than non-religious people perceive themselves.

Study 6 also tested a second hypothesis: that non-religious people should view science and religion more hydraulically (i.e. stronger belief in one is associated with weaker belief in the other) than religious people. The mutually exclusive relationship between science and religion is a major claim of conflict-based accounts of religion and science. However, we suggest that religious people do not actually perceive this relationship as mutually exclusive, and that this perception is popular only among non-religious people.

We recruited 301 participants (234 religious, 66 non-religious) participants who complete two measures. In the first, “perspective-taking” measure, participants used a sliding 1-100 scale to indicate how much religious and non-religious people relied on religion and science as sources of knowledge. For each rating, participants were provided with the definitions of science and religion (see method). Participants also estimated their own reliance on science and religion. In the second “forecasting” task, participants were asked how their beliefs might change under different hypothetical conditions: (a) “Imagine that an important prediction from **scripture** were confirmed. How would this impact your beliefs in religion and science?”, and (b) “Imagine that an important prediction from **science** were confirmed. How would this impact your beliefs in religion and science?” Participants estimated the change in their religious and scientific beliefs using a -50 to 50 scale, where 0 represented no change in belief, -50 represented a complete loss of belief, and 50 represented much stronger belief.

As predicted, non-religious people overestimated how much religious people relied on religion as a source of knowledge in the perspective-taking task, $b = 30.00$, $SE = 4.27$, $t(295) = 7.03$, $p < .001$, 95% CI s [21.60, 38.39], and underestimated how much religious people relied on science as a source of knowledge, $b = -37.99$, $SE = 3.35$, $t(297) = -11.34$, $p < .001$, 95% CI s [-44.58, -31.40]. Interpreting the intercepts of these models showed that non-religious people estimated that religious people relied on religion ($M = 84.89$, $SE = 3.76$) far more than science ($M = 36.40$, $SE = 2.96$), whereas religious people self-reported relying on science ($M = 74.39$, $SE = 1.56$) slightly more than religion ($M = 54.90$, $SE = 2.01$).

We also found that religious people underestimated the extent that non-religious people relied on science as a source of knowledge, $b = -13.19$, $SE = 2.50$, $t(298) = -4.66$, $p = .008$, 95% CI s [-18.76, -7.62], and overestimated the extent that non-religious people relied on religion, $b = 30.20$, $SE = 3.80$, $t(293) = 7.05$, $p < .001$, 95% CI s [21.77, 38.64]. Interpreting the intercepts of these models suggested that religious people estimated that non-religious people relied on science ($M = 78.81$, $SE = 1.33$) more than religion ($M = 35.50$, $SE = 1.98$). While this estimate was qualitatively correct, they underestimated the magnitude of the gap (estimated $M_{diff} = 43.31$ vs. actual $M_{diff} = 80.00$). See Figure 6 for each set of perspective-taking results.

Figure 6. Out-group estimates of how much religious and non-religious people rely on religion and science, compared to their self-reported reliance on religion and science. Lighter shadings correspond to out-group perceptions, whereas darker shadings correspond to self-reports.

We next analysed the forecasting task. Non-religious people saw religion and science as hydraulic, meaning that their increases in religious beliefs correlated with decreases in scientific belief and vice versa, both in light of a confirmed prediction from scripture, $r(63) = -.39, p = .001$, and a confirmed prediction from science, $r(62) = -.59, p < .001$. Religious people, on the other hand, did not indicate a hydraulic relationship between changes in religious and scientific belief, both in light of an important prediction from scripture, $r(232) = -.06, p = .33$, and an important prediction from science, $r(232) = .03, p = .70$ (see Figure 7).

We also examined the main effects of change in belief following a confirmed prediction from science and religion. Secondary analyses found that, in light of a confirmed prediction from scripture, non-religious people forecasted no change in their belief in religion, $b = -1.06, SE = 2.71, t(297) = -.39, p = .70$, 95% CIs $[-6.38, 4.26]$, whereas religious people forecasted more belief in religion, $b = 16.87, SE = 1.43, t(297) = 11.84, p < .001$, 95% CIs $[11.92, 23.95]$. In light of a confirmed prediction from science, both religious people, $b = 20.86, SE = 1.32, t(297) = 15.90, p < .001$, 95% CIs $[18.26, 23.45]$, and non-religious people, $b = 23.94, SE = 2.50, t(297) = 9.56, p < .001$, 95% CIs $[19.01, 28.87]$, forecasted more belief in science. These results show that many religious people are willing to increase their trust in science in light of evidence, but non-religious people will not increase their trust in religion.

Science belief vs. religious belief if a major prediction from **scripture** were confirmed

Science belief vs. religious belief if a major prediction from **science** were confirmed

Figure 7. The relationship between change in science belief and change in religious belief for religious (in blue) and non-religious (in orange) participants. The triangle symbol indicates change in beliefs.

In sum, non-religious people perceived religious people as more reliant on religion and less reliant on science than non-religious people viewed themselves. In addition, non-religious people appeared to view science and religion as mutually exclusive, whereas religious people viewed the relationship as orthogonal.

Discussion

When explaining the world, do we turn to science, religion, or both? Conflict-based accounts suggest that religious and science are incompatible, and that religious people primary rely on religion as a source of knowledge whereas non-religious people rely on science. In contrast, several descriptive studies have found that religious people often integrate scientific and religious sources when they generate explanations. Here we provide a new motivation model of science and religion that synthesizes these perspectives. Our model suggests that non-religious people are motivated to perceive conflict between science and religion because they have committed to science as their primary source of knowledge. And because religious people use both science and religion as sources of knowledge, they view each worldview as each moderately instrumental, consistent with goal systems theory's principle of equifinality.

Our model is not only consistent with past data, it is also supported across six studies in this paper. Our studies show that religious conviction is linked with viewing science and religion

as compatible (Studies 1-2), and that religious people view science and religion as moderately and similarly instrumental sources of knowledge in the context of explaining extraordinary phenomena (Study 3), answering life's big questions (Study 4), and keeping safe during the COVID-19 pandemic (Study 5). Nevertheless, non-religious people overestimate religious people's perceived science-religion conflict (Study 2) and their perceived instrumentality of religion as a source of knowledge, while underestimating religious people's perceived instrumentality of science (Study 6). We also find that religious people view science and religion as orthogonal, whereas non-religious people view them as mutually exclusive sources of knowledge (Study 6).

Because religious people viewed science and religion as moderately and equally instrumental, they were less reliant on science than non-religious people, which is consistent with past findings (8,9). Trust in science is important, and interventions could close this gap between religious and non-religious people, even though it is smaller than many people perceive it to be. But a certain level of scientific scepticism is not unhealthy, especially since science is always self-correcting. The ongoing replication crisis in psychology and other disciplines (and, during COVID-19, medical experts' reversal on the usefulness of mask-wearing) is a testament to the importance of scientific self-scrutiny. For this reason, we encourage more research on the "optimal" level of scientific trust, if such an optimum exists.

Future research might also seek to study different religious subgroups, such as fundamentalists. Since extremism (of any kind) indicates a state of motivational imbalance, in which one need becomes privileged to the extent that it suppresses other needs (24,25), it may be that fundamentalists trust religion significantly more to the point that they devalue science as a source of knowledge. Other religious subgroups (e.g. unitarians) may trust science significantly more than religion. Our inter-religion analyses in Study 2 show that our effects replicate when controlling for different religious traditions, but investigating subgroup differences in future may help add granularity to the current paper's claims.

Our findings also do not mean that religious people are more open-minded in general. Religious people are more open to reconciling science and religion than non-religious people, but this is a specific domain of openness and does not generalize across all domains. For instance, religious people still report more traditionalist attitudes than non-religious people (26,27), and prefer interpersonal partners who have less openness to experience (28).

Conclusion

The scientific revolution promises innovations in medicine and engineering, yet many people are concerned that religious belief is an obstacle to people's adoption of science. We view these concerns as at least partly misplaced. Our evidence suggests that religious people are more open to science than non-religious people believe, and that they use both science and religion as sources of information, which is consistent with basic theories of human motivation. A science-enriched future need not be a faithless one.

Materials and Methods

Data, code and pre-registrations are available at:

https://osf.io/7v4hd/?view_only=f77a9286894e4eec979c8a037e5932a3.

Study 1

Sample Characteristics. Our participants were 2,002 Americans (1007 men, 991 women, 4 “other”; $M_{\text{age}} = 51.23$, $SD_{\text{age}} = 19.32$) from a Pew Research Survey conducted in 2012. The survey was administered to community members over the phone, and included 419 people who did not identify with any religion (non-religious) and 1548 people who endorsed at least one religious identity. Of the religious participants, 746 were Protestant, 448 were Catholic, 23 were Mormon, 11 were Eastern Orthodox, 54 were Jewish, 17 were Muslim, 14 were Buddhist, 18 were Hindu, 6 were Unitarian, and 12 were Jehovah’s witnesses.

Demographic Questions. We included data on gender (dummy-coded with men as “1” and women as “0”), age, income (coded on a scale of 1-10 in which 10 represented greater subjective wealth), and political party membership (recoded into dummy-variables in which “Democrat” and “Other” were contrasted against “Republican”).

Study 2

Sample Characteristics. Our participants were 8,027 religious people (4292 men, 3662 women, 3 non-binary, 7 transgender, 13 intersex, 3 gender non-conformist, 11 “other”, and 27 “prefer not to answer”; $M_{\text{age}} = 51.23$, $SD_{\text{age}} = 19.32$) from 38 nations. All countries had at least 50 datapoints except for Benin, which had 11 datapoints and was excluded from country-by-country analyses. We collected data from Qualtrics panels that was representative for each country on the basis of age, gender, education, and SES.

Demographic Questions. We included data on gender (categorical variable with 8 options, noted in the “sample characteristics” paragraph), age, education (dummy-coded based on whether participants had earned college degree), social ranking (the MacArthur ladder with 11 options such that higher values represented greater SES), politics (a 1-9 scale anchored at 1 “Very Liberal” and 9 “Very Conservative”).

Study 3

Sample Characteristics. We analysed data from 1,173 participants (508 men, 638 women; $M_{\text{age}} = 36.40$, $SD_{\text{age}} = 12.85$) across two different waves of data collection on Amazon Mechanical Turk. Four hundred and three participants from our first wave answered the full set of stimuli. Seven hundred and seventy participants from our second wave answered an abbreviated set of stimuli (see below). In total, 811 participants identified as religious, 335 participants identified as non-religious, and 27 participants did not respond to the question and were not included in our analysis.

Materials and Measures

Dependent Measure. We developed the scale in Study 3 via a pilot study in which people were asked to free-generate extraordinary events, which were used to create nine prototype scenarios for the most common categories. Table 3 lists the five scenarios that were used in both studies, and the OSM lists the full set of stimuli and notes some small differences across the two waves of data collection.

Table 3. Study 3 Stimuli

Category	Description
----------	-------------

Clairvoyance*	A man visits an elderly woman who works as a fortune-teller. After consulting some cards, she tells him that he will receive an unexpected job offer in the next month. It happens exactly as she predicted.
Witchcraft*	A stranger has raped a woman from an African village. Unbeknownst to him, the village priest performs a ritual of cursing against him. A short time later the stranger falls terribly ill.
The Afterlife*	A man has an argument with a close friend, who dies before they can be reconciled. A few weeks later, waking during the night, the man believes he can see his friend standing at the end of his bed. His friend reassures him that all is well before disappearing
Unexplained Recovery*	A man is diagnosed as having incurable cancer. Friends and family gather every day for a week to pray for his recovery. Shortly after this his doctor informs him that his cancer seems to have disappeared.
Ghost Sightings*	A man inherits an old farmhouse. The first time he sleeps in the house, he awakes terrified in the night to see a ghostly female figure standing above him, knife in hand. He later discovers that one of his ancestors had murdered a servant-girl in a room near where he slept.

Note. Starred items were included in both waves of data collection.

Religious Identification. We measured religious identification by asking participants to choose from one of 10 religious identities at the end of the survey: Christian, Sikh, Buddhist, Hindu, Muslim, Jewish, Atheist, Agnostic, None, or “Other.” Participants who chose “Atheist,” “Agnostic,” or “None” were classified as non-religious (see Jong et al., 2012), and all other participants were classified as religious.

Study 4

Sample Characteristics. We recruited a total of 209 participants (69 men, 138 women, 2 other; $M_{\text{age}} = 21.52$, $SD_{\text{age}} = 4.64$) from the University of Otago in New Zealand for a laboratory study. Study 4 used the same measure of religion as Study 3, but included an additional option of “undecided.” We excluded 17 participants who indicated they were undecided, leaving a total of 138 non-religious participants and 54 religious participants who identified as Buddhist ($n = 4$), Christian ($n = 44$), Hindu ($n = 4$), Jewish ($n = 1$), and Muslim ($n = 1$). This study was run as a student’s senior thesis, and our sample size goal was to recruit as many participants as possible throughout the course of a semester.

Questions. Participants viewed a series of questions about six meaningful and controversial topics: the universe, human existence, consciousness, religion, death, and suicide. Participants in the “how” condition were asked how each of the six phenomena work or came into existence (e.g., “How did the universe come to exist? What was the cause?”), while participants in the “why” condition were asked why each phenomenon exists (e.g., “Why did the universe come to exist? What was the purpose?”). The full list of questions is given in our supplemental materials.

Procedure. After providing informed consent, participants were brought into a testing room with a computer where they completed all experimental materials online. Participants were told that they would be presented with six “big questions” and asked to provide their own answers after having an opportunity to consult up to four different sources for help.

Participants were then randomly assigned to view either the six causal (“how”) questions or the six functional (“why”) questions. For each question, participants had the option to consult up to four sources before providing their own written responses, but were required to consult at least one. After viewing the first selected source’s answer, the participant had the option to answer the question without further consultation, or to consult another source from among the remaining three. The process was repeated until the participant chose to answer the question, or until they viewed all sources and were then prompted to do so. Participants completed the subjective influence measure to assess their reliance on each source for each individual question.

Analytic Approach. One model included subjectively influence as the DV, whereas the other used a logistical regression and used sources consulted as the DV. Both models included participant as a random effect, and religious identity, source of information, and their interaction as fixed effects. We used dummy-coded variables for religious identity (non-religious = 0, religious = 1) and source of information (0 = scientific, 1 = religious). We then ran simple slopes analyses to tease apart the interaction. To explore whether condition (causal vs. functional) influenced ratings of the scientific and religious sources among religious and non-religious participants, we entered participant condition into a 3-way interaction after our initial models. This model did not converge for sources consulted, so we only examined it for self-reported influence. For all analyses, we collapsed across types of questions (e.g. the afterlife) because our results were similar for each type. All data are open for readers who wish to analyse how people apply religion and science to different kinds of questions.

Study 5

Sample Characteristics. We advertised on Amazon Mechanical Turk for 400 participants, which an f^2 power analysis suggested would provide 99% power to detect a medium effect size of .15, and 98% of power to detect a smaller effect size of .05. In total, 441 participants signed up for the study, and 401 participants (263 men, 137 women, 1 “other”; $M_{\text{age}} = 36.96$, $SD_{\text{age}} = 11.54$) completed it. We used the same measure of religious belief as Studies 2 and 4. According to this measure, 129 participants identified as non-religious, whereas 271 participants identified as religious, with 165 Catholics, 73 Protestants, 5 Jews, 2 Buddhists, 4 Hindus, 2 Muslims, 2 Sikhs, and 18 participants who identified with other religions.

Perceived Instrumentality and Engagement Measure. Participants responded to all items concerning perceived instrumentality and self-reported engagement on a scale from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”). Perceived instrumentality and self-reported engagement were highly correlated ($r = .84$).

Procedure. Participants signed up for this study on Amazon Mechanical Turk in exchange for US\$1. They first answered the perceived instrumentality and self-reported engagement items for each science-based and faith-based strategy, which were presented in randomized order.

Analysis Plan. We used a multi-level model with observations (2681) nested in participants (401) and random intercepts and slopes. We controlled for age, gender, and political orientation in this analysis, since these factors could plausibly covary with responses to COVID-19. Significant results replicated regardless of whether we included these controls.

Study 6

Sample Characteristics. We advertised the study for 300 Amazon Mechanical Turk participants, which an f^2 power analysis suggested would provide 94% of power to detect a small effect size of .05. In total, 301 participants (193 men, 104 women, 4 “other”; $M_{\text{age}} = 37.67$, $SD_{\text{age}} = 10.71$) completed the study, passed our attention check, and were included in analysis. We used the same measure of religion as Study 1. According to this measure, 66 participants identified as non-religious and 234 participants identified as religious, including 110 Catholics, 56 Protestants, 6 Buddhists, 6 Jews, and 3 Hindus.

Perspective-Taking Measure. Before completing the measure, we provided all participants with definitions of science and religion. Our prompt read (with emphasis in the original), “There are many sources of knowledge, but two popular sources of knowledge are **religion (e.g. insights from scripture, advice from religious authorities)** and **science (e.g. insights from scientific studies, advice from scientific experts)**. We would like you to answer some questions about science and religion.”

Participants used a sliding 1-100 scale to indicate how much religious and non-religious people relied on religion and science as sources of knowledge. For each rating, participants were provided with the definitions of science and religion that are bolded above. Participants then estimated their own reliance on science and religion as sources of knowledge. This meant that we gathered three ratings from all participants: ratings of their own (religious or non-religious) group, ratings of the other group, and ratings of themselves. We focus on participants’ self-ratings and ratings of the other group here, but the supplement summarizes results using the same-group data.

Forecasting Measure. For the forecasting task, participants were given the prompt “next we would like you to consider how your own beliefs might change in light of different information.” Participants were then asked (emphasis in original), “Imagine that an important prediction from **scripture** were confirmed. How would this impact your beliefs in religion and science?”, and separately, “Imagine that an important prediction from **science** were confirmed. How would this impact your beliefs in religion and science?” For both prompts, participants estimated the change in their religious and scientific beliefs using a -50 to 50 scale, where 0 represented no change in belief, -50 represented a complete loss of belief, and 50 represented much stronger belief.

Analysis Plan. To test our hypothesis about how religious and non-religious people perceived each other, we compared religious people’s self-reported reliance on science and religion with non-religious people’s perceptions of religious people, and vice versa. Technically, this required creating two new variables in our dataset. The first variable contained concerned religious people’s reliance on science. For non-religious people, this variable contained their ratings of religious people, whereas for religious people, this variable contained their self-reported reliance on science and religion. The second variable contained data on non-religious people’s reliance on science. For non-religious people, this variable contained their self-reported reliance on science and religion, whereas for religious people, this variable contained their ratings of non-religious people. This organization meant that a regression could easily contrast non-religious people’s ratings of religious people against religious people’s ratings of their own worldview, and vice versa.

To test our hypothesis about religious and non-religious people’s perception of the relationship between science and religion, we created separate datasets for religious and non-religious people, and then correlated changes in participants’ belief in science and belief in

religion in light of an important confirmed prediction from scripture and an important confirmed prediction from science. Our hypothesis was that there would be a negative correlation for non-religious people but no significant correlation for religious people. We also compared the confidence intervals to test whether the negative association for non-religious people was significantly larger than the null association for religious people.

References

1. Atran S. (1998) Folk biology and the anthropology of science: Cognitive universals and cultural particulars. *Behavioral and Brain Sciences*. 21(4), 547–69.
2. Dawkins R, Ward L. (2006) *The god delusion* (Houghton Mifflin Company, Boston).
3. Hitchens C. (2008) *God is not great: How religion poisons everything*. (McClelland & Stewart, New York).
4. Harris S. (2006) *Science must destroy religion*. The Huffington Post.
5. Dennett DC. (2006) *Breaking the spell: Religion as a natural phenomenon*. (Penguin).
6. Preston J, Epley N. (2006) Science and God: An automatic opposition between ultimate explanations. *Journal of Experimental Social Psychology*. 45(1), 238–41.
7. Payir A, Davoodi T, Cui KY, Clegg JM, Harris PL, Corriveau K. (2021) Are high levels of religiosity inconsistent with a high valuation of science? Evidence from the United States, China and Iran. *International Journal of Psychology*. 56(2), 216–27.
8. McPhetres J, Jong J, Zuckerman M. (2021) Religious Americans Have Less Positive Attitudes Toward Science, but This Does Not Extend to Other Cultures. *Social Psychological and Personality Science*. 12(4), 528–36.
9. Chan E. (2018) Are the religious suspicious of science? Investigating religiosity, religious context, and orientations towards science. *Public Underst Sci*. 27(8), 967–84.
10. DeFranza D, Lindow M, Harrison K, Mishra A, Mishra H. Religion and reactance to COVID-19 mitigation guidelines. (2021) *American Psychologist*. Available from: <https://psycnet.apa.org/fulltext/2020-58613-001.pdf>
11. Legare CH. (2012) The Coexistence of Natural and Supernatural Explanations Across Cultures and Development. *Child Development*. 83(3), 779–793.
12. Legare CH, Gelman SA. (2008) Bewitchment, biology, or both: The co-existence of natural and supernatural explanatory frameworks across development. *Cognitive Science*. 32(4), 607–42.
13. Gelman S, Legare C. (2009) South African children’s understanding of AIDS and flu: Investigating conceptual understanding of cause, treatment and prevention. *Journal of Cognition and Culture*. 9(3–4), 333–46.
14. Watts J, Passmore S, Jackson JC, Rzymiski C, Dunbar RI. (2020) Text analysis shows conceptual overlap as well as domain-specific differences in Christian and secular worldviews. *Cognition*. 201, 104290.
15. Harris PL, Koenig MA. (2006) Trust in Testimony: How Children Learn About Science and Religion. *Child Development*. 77(3), 505–24.
16. Shtulman A. Epistemic similarities between students’ scientific and supernatural beliefs. *Journal of Educational Psychology*. 105(1), 199–212.

17. Kruglanski AW, Chernikova M, Babush M, Dugas M, Schumpe BM. (2015) The architecture of goal systems: Multifinality, equifinality, and counterfinality in means—end relations. In: *Advances in motivation science*. p. 69–98.
18. Kruglanski AW, Shah JY, Fishbach A, Friedman R, Chun WY, Sleeth-Keppler D. A theory of goal systems. (2002) *Advances in experimental social psychology*. 34(2):331–78.
19. Kruglanski AW, Pierro A, Sheveland A. How many roads lead to Rome? Equifinality set-size and commitment to goals and means. (2011) *European Journal of Social Psychology*, 41(3), 344–52.
20. Rusbult CE. (1980) Commitment and satisfaction in romantic associations: A test of the investment model. *Journal of Experimental Social Psychology*. 16(2), 172–86.
21. Thibaut JW. (2017) *The social psychology of groups*. (Routledge).
22. Klein WM, Kunda Z. (1992) Motivated person perception: Constructing justifications for desired beliefs. *Journal of Experimental Social Psychology*. 28(2), 145–68.
23. Gould SJ. (2014) Nonoverlapping magisteria. *Filozoficzne Aspekty Genezy*. 11, 7–21.
24. Kruglanski AW, Szumowska E, Kopetz CH, Vallerand RJ, Pierro A. (2021) On the psychology of extremism: How motivational imbalance breeds intemperance. *Psychological Review*. 128(2), 264.
25. Kruglanski AW, Jasko K, Chernikova M, Dugas M, Webber D. (2017) To the fringe and back: Violent extremism and the psychology of deviance. *American Psychologist*, 72(3), 217.
26. Fam KS, Waller DS, Erdogan BZ. (2004) The influence of religion on attitudes towards the advertising of controversial products. *European Journal of marketing*. 38(5/6), 537–555.
27. Adameczyk A, Pitt C. (2009) Shaping attitudes about homosexuality: The role of religion and cultural context. *Social Science Research*. 38(2), 338–51.
28. Jackson J, Halberstadt J, Jong J, Felman H. (2015) Perceived openness to experience accounts for religious homogeneity. *Social Psychological and Personality Science*. 6(6), 630–8.

Supplemental Materials

Supplemental Study 1

Method

Participants. Seventy non-believers and 124 believers (70 men and 124 women, $M_{age} = 32.91$, $SD = 10.54$) were recruited via Amazon Mechanical Turk to complete an online study. Because we did not want to make their religious affiliation salient participants we did not target our invitation specifically to each group separately. Given the religious composition of participants on MTurk we assumed it would result in unequal samples sizes.

Materials and Measures

Instrumentality of Epistemic Sources. Participant read the following instruction “In this study, we are interested in how you perceive SCIENCE as a source of knowledge through which you can understand the world. Please rate the extent to which SCIENCE is an effective source of knowledge.” Participants answered on a scale from 1 (Very ineffective) to 9 (Very effective). Next, using the same prompt and the scale they rated the extent to which they perceived religion to be an effective source of knowledge. We counterbalanced the order in which participants responded to the questions about science and religion. Two groups of participants received the questions about science and religion on separate screens while one group of participants responded to those questions on the same screen. However, the way the question was presented did not impact the ratings.

Perceived Compatibility Between Science and Religion. Participants rated their agreement with three statements (“Science and religion are compatible,” “Science and religion are fundamentally in conflict,” and “Science and religion complement each other”; $\alpha = .88$). Due to a researcher error, “complement” was misspelled as “compliment” in the survey.

Results

Our initial analyses showed that believers perceived science and religion as generally more compatible ($M = 4.17$, $SE = 0.14$) than nonbelievers ($M = 2.43$; $SE = 0.18$), $F(1, 192) = 56.82$, $p < .001$, $\eta^2 = .23$. We next performed a repeated measures ANOVA with Sources (Religion vs. Science) as a within-subject factor and group (Believers vs. Nonbelievers) as a between-subject factor. We obtained a significant Source $\times$ Belief interaction, $F(1, 192) = 123.90$, $p < .001$, $\eta^2 = .39$. In line with our hypotheses, nonbelievers ($M = 8.39$, $SE = 0.15$) perceived science as a more effective source of knowledge than believers ($M = 7.65$, $SE = 0.11$), but believers perceived religion as more effective source of knowledge ($M = 5.74$; $SE = 0.20$) than non-believers ($M = 2.14$, $SE = 0.26$). Another way to describe it is to say that whereas nonbelievers perceived only science as an effective source of knowledge and they did not see religion as an effective epistemic source ($F(1, 192) = 402.65$, $p < .001$, $\eta^2 = .68$), the difference in perceived effectiveness of both science and religion was much smaller among believers, $F(1, 192) = 66.86$, $p < .001$, $\eta^2 = .26$.

Supplemental Study 2

Method

Participants. Sixty-six non-religious and 116 religious people (90 men and 92 women, $M_{age} = 37.63$, $SD = 12.46$) were recruited via Amazon Mechanical Turk to complete an online study.

Measures

Instrumentality of Epistemic Sources. Participants answered the following question: “To what extent do you rely on the following people or institutions when you do not know what to think about something?” Next participants were presented with ten epistemic sources in a randomized order: Your parents, the Internet, the government, celebrities, God, your friends, science, intuition, your co-workers, and school teachers. Participants answered using the scale from 1 (Not at all) to 7 (A great deal). In the subsequent analyses we only looked at the responses regarding God and science.

Extraordinary Events. We used the same extraordinary events scale as Study 3.

Results

We performed a repeated measures ANOVA with Sources (Religion vs. Science) as a within-subject factor and group (Believers vs. Nonbelievers) as a between-subject factor. We obtained a significant Source $\times$ Belief interaction, $F(1, 180) = 122.33, p < .001, \eta^2 = .41$. Nonbelievers ($M = 5.52, SE = 0.20$) relied on science more than believers ($M = 4.70, SE = 0.15$), but believers relied on religion ($M = 4.73; SE = 0.17$) more than nonbelievers ($M = 1.32, SE = 0.22$). This time, the difference in reliance on both sources was not significant for believers ($p = .881$) but it was again large and significant for nonbelievers, $F(1, 180) = 188.81, p < .001, \eta^2 = .51$.

We obtained the same interaction when it comes to the explanatory power of science and religion for the extraordinary phenomena, $F(1, 180) = 94.73, p < .001, \eta^2 = .34$. Nonbelievers ($M = 5.81, SE = 0.28$) rated explanatory power of science as higher than believers did ($M = 4.15, SE = 0.21$), but believers rated explanatory power of religion ($M = 5.12; SE = 0.19$) higher than nonbelievers did ($M = 2.11, SE = 0.25$). Moreover, in case of mysterious events, believers rated the explanatory power of religion as significantly higher than that of science ($F(1, 180) = 11.22, p = .001, \eta^2 = .06$), while among nonbelievers the pattern was reversed ($F(1, 180) = 93.40, p < .001, \eta^2 = .34$).

Supplemental Information for Study 3

Full Extraordinary Events Scale

Table S1 contains all the scenarios in our extraordinary events scale.

Table S1. Study 3 Stimuli	
Category	Description
Clairvoyance*	A man visits an elderly woman who works as a fortune-teller. After consulting some cards, she tells him that he will receive an unexpected job offer in the next month. It happens exactly as she predicted.
Witchcraft*	A stranger has raped a woman from an African village. Unbeknownst to him, the village priest performs a ritual of cursing against him. A short time later the stranger falls terribly ill.
The Afterlife*	A man has an argument with a close friend, who dies before they can be reconciled. A few weeks later, waking during the night, the man

	believes he can see his friend standing at the end of his bed. His friend reassures him that all is well before disappearing
Unexplained Recovery*	A man is diagnosed as having incurable cancer. Friends and family gather every day for a week to pray for his recovery. Shortly after this his doctor informs him that his cancer seems to have disappeared.
Ghost Sightings*	A man inherits an old farmhouse. The first time he sleeps in the house, he awakes terrified in the night to see a ghostly female figure standing above him, knife in hand. He later discovers that one of his ancestors had murdered a servant-girl in a room near where he slept.
Prayer	A man goes through an acrimonious marriage breakup. In a fit of anger his ex-wife prays that he will be punished. In the following weeks he falls ill, suffering from a life-threatening illness.
Religious Trance	At religious meetings people sometimes fall into a trance-like state and 'speak in tongues' (they pray aloud in what seems to be a language that no one present can understand).
Psychokinesis	There exists an individual who seems able to move objects simply by thinking about them. No-one has been able to discover how he does this.
Out of Body Experiences	A man suffers a heart attack and is taken to the hospital. He later discovers that at one point his heart stopped beating for several minutes. He has a vivid memory of floating above the bed, and believes he can describe what the medical staff were doing.

There were two key differences across Study 3's two waves of data collection. First, participants in the first wave of data collection evaluated science's explanatory power and religion's explanatory power simultaneously for each event—that is, the science item and the religion item were displayed on the same page. Participants in the second wave, however, viewed them on different pages (counterbalanced). We made this change because having both items on the same page could imply that the options were mutually exclusive, and we wanted to make sure our results replicated without this artefact.

Second, participants in the second wave of data collection only responded to 5 of the 9 stimuli in our scale so that we could test whether a short-form version of the measure had the same psychometric properties as our full measure. This shorter 5-item scale also dropped any items that featured themes from Western religion (e.g. prayer, speaking in tongues). The 5 items included in both studies are starred in Table 3, and we conducted separate psychometric analyses of each wave of analysis given the changes in our measurement technique. We include psychometric analysis of the scale's properties in the supplemental materials, which support the construction of two separate indices, tapping the perceived explanatory power of (a) religion and (b) science.

Psychometrics for Extraordinary Events Scale

We evaluated the psychometric properties of the extraordinary events scale through two exploratory factor analysis (EFAs). It is common to evaluate scales using a combination of EFA and confirmatory factor analysis (CFA). However, we chose to conduct two EFAs because we used a shorter version of the scale in our second sample.

All of our EFAs revealed two-factor solutions. For the 9-item measure, the first factor had an eigenvalue of 9.14 and contained participants' ratings of science's explanatory power. The second factor had an eigenvalue of 3.77 and contained participants' ratings of religion's explanatory power. The 5-item measure had a very similar structure. The first factor had an eigenvalue of 4.79 and contained participants' ratings of religion's explanatory power, whereas the second factor had an eigenvalue of 2.09 and contained participants' ratings of science's explanatory power. All items loaded on their factors above .50 and no items cross-loaded above .40. No other factors exceeded eigenvalues of 1.00, suggesting that the miracles scale was a stable two-factor measure with one factor tapping beliefs in science's explanatory power and another factor tapping beliefs in religion's explanatory power.

Figure S1. Illustrations of exploratory factor analyses of the miracle scale's 9-item form (left) and 5-item form (right). Factor recommendations from eigenvalue analysis, parallel analysis, and optimal coordinates analysis are displayed in the top right.

Supplemental Information for Study 4

Table S2 provides the full list of questions that participants saw in Study 4.

Table S2.

List of Questions in Study 4

Question Topic	“How” Format	“Why” Format
Universe	How did the universe come to exist? What was the cause?	How did the universe come to exist? What was the purpose?
People	How did people come to exist? What was the cause?	How did people come to exist? What was the purpose?
Consciousness	What causes consciousness?	What is the purpose of consciousness?
Religion	How do people come to have religious belief? What is the cause?	How do people come to have religious belief? What is the purpose?
Death	How do people die? What causes death?	Why do people die? What is the purpose of death?
Suicide	What causes suicide?	Why does suicide exist? What purpose does it serve?

Supplemental Information from Study 5

Here we report a small deviation from pre-registration. We pre-registered including an innocuous behaviour—drinking wine with dinner” as an attention check, such that we would exclude anyone who rated this behaviour as a somewhat effective strategy for mitigating COVID-19. However, we realized shortly after launching the study that people might view drinking wine with dinner as psychologically palliative, and descriptive statistics showed that over a quarter ($n = 143/401$) of our sample rated this behaviour as at least somewhat effective (a 4 or above out of 7) for mitigating the impact of COVID-19. For this reason, we did not use the item as an attention check.

Supplemental Information for Study 6

We conducted two further analyses for Study 6 that we do not report in the main text for space considerations. First, we conducted a replication of the finding that religious people perceive less conflict between science and religion than non-religious people. Second, we replicated our perspective-taking finding using people’s ratings of their own religious group (e.g. religious people rating other religious people) rather than analysing their own attitudes and beliefs.

Conflict Analyses

Our pilot study and supplemental study found that religious people perceived less conflict between science and religion than non-religious people. Study 6 replicated this finding. To do this analysis, we included 3 items assessing the perceived conflict between science and religion, which were rated on a 1-7 scale: (1) “In your opinion, do you think science conflicts with religion?” (1: Definitely does not conflict – 7: Definitely conflicts), (2) “Can science and religion both be correct, or can only one be correct?” (1: Both can be correct – 7: Only one can be correct), (3) “In your opinion, are religion and science competing to explain the same phenomena?” (1: Not at all in competition – 7: Definitely in competition). Analyses showed that religious people endorsed less conflict for each item, rating science and religion as less conflicting, $b = -.78$, $SE = .23$, $t(298) = -3.45$, $p < .001$, less in competition, $b = -.54$, $SE = .25$, $t(298) = -2.12$, $p < .001$, and less likely to rate that only one worldview can be correct, $b = -1.36$, $SE = .27$, $t(298) = -4.99$, $p < .001$.

Perspective-Taking Analysis

In our supplemental perspective-taking analysis, we used the same transformation technique in the main group, but used people’s ratings of their religious in-group rather than themselves. In other words, we created two variables. One variable contained data on religious people’s reliance on science. For non-religious people, this variable contained their ratings of religious people, whereas for religious people, this variable contained their ratings of fellow religious people. The other variable contained data on non-religious people’s reliance on science. For non-religious people, this variable contained their ratings of fellow non-religious people, whereas for religious people, this variable contained their ratings of non-religious people. This organization meant that non-religious people’s ratings of religious people could be easily contrasted against religious people’s ratings of their own group’s worldview in a regression, and vice versa.

Results mirrored our main text findings which used data from people's own worldviews. In other words, non-religious people overestimated how much religious people relied on religion as a source of knowledge, $b = 8.32$, $SE = 2.85$, $t(298) = 2.92$, $p = .004$, and underestimated how much religious people relied on science as a source of knowledge, $b = -17.04$, $SE = 3.99$, $t(297) = -4.27$, $p < .001$. Interpreting the intercepts of these models suggested that non-religious people estimated that religious people relied on religion ($M = 84.89$, $SE = 2.51$) more than science ($M = 36.40$, $SE = 3.53$), whereas religious participants rated fellow religious people as relying on religion ($M = 76.57$, $SE = 1.34$) more than science ($M = 53.44$, $SE = 1.86$), but to a lesser extent.

Whereas non-religious people perceived religious people as more extreme than religious participants self-reported, religious people perceived non-religious people as more moderate. Religious people underestimated the extent that non-religious people relied on science as a source of knowledge, $b = -7.95$, $SE = 2.95$, $t(298) = -2.69$, $p = .008$, and overestimated the extent that non-religious people relied on religion, $b = 28.72$, $SE = 4.21$, $t(296) = 6.83$, $p < .001$. Interpreting the intercepts of these models suggested that religious people estimated that non-religious people relied on science ($M = 78.81$, $SE = 1.38$) more than religion ($M = 35.50$, $SE = 1.98$). Non-religious people had the same intuition, but judged the gap as far greater (religious participant $M_{\text{diff}} = 43.31$ vs. non-religious participant $M_{\text{diff}} = 79.97$).