

Global evidence of extreme intuitive moral prejudice against atheists

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Mounting evidence supports long-standing claims that religions can extend cooperative networks^{1–9}. However, religious prosociality may have a strongly parochial component⁵. Moreover, aspects of religion may promote or exacerbate conflict with those outside a given religious group, promoting regional violence¹⁰, intergroup conflict¹¹ and tacit prejudice against non-believers^{12,13}. Anti-atheist prejudice—a growing concern in increasingly secular societies¹⁴—affects employment, elections, family life and broader social inclusion^{12,13}. Preliminary work in the United States suggests that anti-atheist prejudice stems, in part, from deeply rooted intuitions about religion's putatively necessary role in morality. However, the cross-cultural prevalence and magnitude—as well as intracultural demographic stability—of such intuitions, as manifested in intuitive associations of immorality with atheists, remain unclear. Here, we quantify moral distrust of atheists by applying well-tested measures in a large global sample ($N=3,256$; 13 diverse countries). Consistent with cultural evolutionary theories of religion and morality, people in most—but not all—of these countries viewed extreme moral violations as representative of atheists. Notably, anti-atheist prejudice was even evident among atheist participants around the world. The results contrast with recent polls that do not find self-reported moral prejudice against atheists in highly secular countries¹⁵, and imply that the recent rise in secularism in Western countries has not overwritten intuitive anti-atheist prejudice. Entrenched moral suspicion of atheists suggests that religion's powerful influence on moral judgements persists, even among non-believers in secular societies.

Speculation about whether morality depends on religious belief has a long history. The ancient Chinese philosopher Mozi claimed that belief in ghosts was essential for moral restraint¹⁶. In Plato's *Euthyphro*¹⁷, Socrates debated whether morality can even be properly defined without reference to divine preference. Dostoevsky¹⁸ famously questioned whether moral prohibitions could carry weight without belief in a deity. Modern investigations reflect this perceived link between belief in god(s) and morality, as recent small sample studies in North America suggest deep moral suspicion of individuals who do not believe in god(s)^{13,19}.

Evolutionary theories of religion predict that prejudice against atheists may persist even in secular cultures, either as part of a suite of adaptations linking belief to within-group cooperation²⁰ or

as a consequence of culturally transmitted²¹ and entrenched pro-religious norms⁵. Indeed, recent studies suggest religions evolved in part by supporting trust and cooperation among coreligionists^{15,22,23}. Signals of religiosity can even extend trust across religions among believers, though not to non-believers²⁴. In contrast, classic social psychological work²⁵ predicts that only believers will be prejudiced against atheists and that distrust of atheists would not be apparent in secular societies. To date, these two perspectives have not been directly contrasted, and the global prevalence of intuitive anti-atheist prejudice and its persistence among atheists themselves is currently unknown. A recent Pew survey suggests a relationship between country-wide levels of religious belief and explicit judgments that morality requires religion¹⁵. However, people often lack introspective access to their intuitions, and respond to appear socially desirable. As such, little is known about the potential cross-cultural ubiquity of intuitions linking religion and morality.

Here, we rigorously test a prediction derived from a cultural evolutionary model of religion⁵: that anti-atheist prejudice remains globally prevalent, even in secular societies and among atheists. In contrast to previous studies, we quantify levels of anti-atheist distrust using well-tested measures of intuitive information processing that can be adapted for studying prejudice in a large and diverse cross-cultural sample, while adjusting for individual differences in level of religious belief, demographic covariates and country-level dependencies in responses. Our sample is drawn from 13 countries on 5 continents. We chose these countries because they: (1) exhibit substantial country-level variability in average religious belief including both highly secular societies (for example, Netherlands, Czech Republic, Finland, China) and highly religious ones (for example, United Arab Emirates, Mauritius, India; Supplementary Table 3 shows average belief in god(s) across countries); (2) represent diverse dominant religions and religious histories, including countries with Christian, Muslim, Hindu, Buddhist and secular majorities; and (3) represent diverse cultural, political, socioeconomic, historical and geographical contexts. This diverse sample allowed us to extend our investigation well beyond the WEIRD (Western, educated, industrialized, rich, democratic) samples that predominate the social sciences²⁶.

We developed a measure to assess extreme anti-atheist prejudice by using a simple experimental design that targets intuitive biases¹⁹. In this task, participants read a description of a man who tortures animals as a child then as an adult exhibits escalating violence

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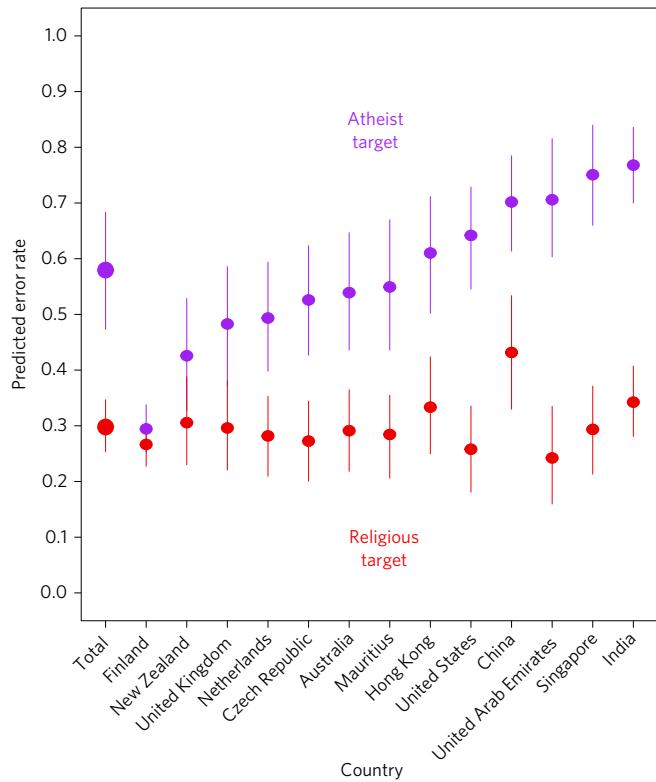


Figure 1 | Across 13 countries, serial murder was seen as more representative of atheists than of religious believers. Predicted error probabilities (95% HPDI) are presented for the total estimate and all 13 sites.

culminating with the murder and mutilation of five homeless people. Then, participants are judged whether it is more probable that the villain is (A) a teacher or (B) a teacher who either (manipulated between subjects) is a religious believer or does not believe in god(s). Thus, no individual participant is directly asked whether they think the perpetrator is or is not a believer. Instead, the conjunction fallacy²⁷ rates (choosing option B—a logically incorrect answer) between conditions can be used to infer indirectly the degree to which a description of a serial murderer is intuitively seen as more representative of religious people or atheists, respectively. Full stimuli appear in the Supplementary Information. In our preregistration of methods and hypotheses before data collection commenced (<https://osf.io/f6tcr/>), we hypothesized both universality and variability across countries, such that moral distrust of atheists would be evident in all sites, but the strongest intuitive religion–morality links would be observed in the most strongly religious samples.

We conducted identical experiments in all 13 sites. We targeted at least 100 participants per experimental condition (anti-atheist bias versus anti-religious bias). After filtering out inattentive participants (13%) and incomplete responses, there were a total of 3,256 participants for final analysis (69% female, age 16–70 years; mean = 25.07, s.d. = 7.84), with a median of 162 participants per country (range: 129–993). Participants came from diverse societies and included both student and general population samples (Supplementary Information).

Because our data represent a shared experimental design across sites with participants nested within countries, we used a multilevel (hierarchical) modelling approach. Specifically, our hierarchical Bayesian model²⁸ quantifies the extent to which people view gross immorality (animal torture, serial murder and mutilation) as more representative of atheists than of believers, both overall and within each country, adjusting for individual levels of belief in God, gender, age and perceived socioeconomic status (all standardized).

Table 1 | Full model summary.

	Coefficient	s.d. _{coef}	95% HPDI	
			Low	High
Fixed effects				
Belief	0.10	0.06	-0.03	0.23
Age	0.11	0.05	0.01	0.19
Female	0.03	0.04	-0.04	0.11
SSES	0.03	0.04	-0.06	0.11
Belief x Target	0.11	0.09	-0.07	0.29
Random intercepts				
Total	-0.86	0.12	-1.09	-0.63
Australia	-0.90	0.19	-1.27	-0.51
China	-0.28	0.22	-0.70	0.15
Czech Republic	-0.99	0.19	-1.38	-0.62
Finland	-1.01	0.10	-1.22	-0.82
Hong Kong	-0.70	0.21	-1.11	-0.28
India	-0.66	0.15	-0.95	-0.37
Mauritius	-0.93	0.19	-1.31	-0.57
Netherlands	-0.94	0.18	-1.30	-0.57
New Zealand	-0.82	0.20	-1.21	-0.43
Singapore	-0.90	0.21	-1.31	-0.50
United Arab Emirates	-1.17	0.26	-1.66	-0.67
United Kingdom	-0.87	0.20	-1.26	-0.48
United States	-1.08	0.21	-1.50	-0.69
Random slopes (target)				
Total	1.19	0.22	0.74	1.62
Australia	1.06	0.28	0.51	1.62
China	1.15	0.30	0.55	1.71
Czech Republic	1.10	0.27	0.55	1.63
Finland	0.13	0.15	-0.14	0.43
Hong Kong	1.16	0.31	0.56	1.75
India	1.87	0.23	1.44	2.35
Mauritius	1.13	0.29	0.57	1.72
Netherlands	0.91	0.26	0.39	1.42
New Zealand	0.52	0.29	-0.06	1.08
Singapore	2.02	0.32	1.41	2.65
United Arab Emirates	2.06	0.36	1.35	2.76
United Kingdom	0.80	0.29	0.21	1.34
United States	1.66	0.29	1.13	2.24

Age, gender, subjective socioeconomic status (SSES) and participant belief in God were standardized. Target was coded: atheist = 1, religious = 0. The 95% HPDI illustrates uncertainty around posterior means, and indexes the interval in which the 95% most credible estimates lie.

Additionally, the model adjusts for country-level dependencies by modelling the intercept and slope of anti-atheist prejudice as random across countries (Supplementary Information). Full model coefficients appear in Table 1. We observed substantial heterogeneity in overall conjunction fallacy performance across countries. Because our primary focus was on degrees of intuitive moral distrust of atheists (in contrast to believers) across countries, we do not speculate further about sources of heterogeneity in overall performance, and instead focus on experimental condition differences within countries.

Our results offer strong evidence of extreme intuitive moral prejudice against atheists. Our model predicts an overall conjunction error rate probability of 0.58 for atheist targets (95% highest posterior density interval (HPDI) 0.48, 0.68), but only 0.30 (95%

HPDI 0.25, 0.34) for religious targets; relative risk is 1.96 (95% HPDI 1.53, 2.37) (posterior probability of atheist target errors exceeding religious target errors (henceforth ‘posterior probability’) exceeds 0.999). Thus, people overall are roughly twice as likely to view extreme immorality as representative of atheists, relative to believers. Importantly, the effects hold even after adjusting for country variability in the strength of intuitive moral prejudice and individual-level variability in demographics. Figure 1 and Table 2 summarize model-predicted conjunction error probabilities across sites for atheist and religious targets. Consistent with predictions, extreme intuitive moral distrust of atheists is both globally evident and variable in its magnitude across countries.

Surprisingly, after adjusting for substantial latent country-level dependencies between sites, the within-country interaction between individual belief in God and conjunction error rates across targets is weak (posterior probability = 0.88; Table 1). Thus, while anti-atheist prejudice varies strongly by country, such prejudice is largely robust across the spectrum of participant religiosity within countries; both high and low believers are about twice as likely to commit conjunction errors for atheist targets than for religious targets (Fig. 2). Furthermore, we examined posterior model predictions for atheists (those rating their belief in God at 0 out of 100). Among atheists, our model predicts an overall conjunction error rate probability of 0.52 for atheist targets (95% HPDI 0.40, 0.64), but only 0.28 (95% HPDI 0.22, 0.33) for religious targets; relative risk is 1.91 (95% HPDI 1.41, 2.48) (posterior probability > 0.999). Effects hold even in highly secular countries such as Australia, China, the Czech Republic, the Netherlands and the United Kingdom: even atheists are predicted to intuitively associate serial murder more with atheists than with believers in these countries (all posterior probabilities exceeding 0.98). Indeed, only in Finland (posterior probability = 0.48) and to a lesser extent New Zealand (posterior probability = 0.90) is the evidence of intuitive anti-atheist prejudice among atheists less conclusive. (Full inferences at both minimum and maximum belief appear in the Supplementary Information.) To check robustness of intuitive moral distrust of atheists among atheists, we conducted a second analysis isolating all participants across sites who rated their belief in God at zero ($N = 553$) and explored overall atheist intuitive moral distrust of atheists (experimental condition treated as fixed) across sites (varying intercepts of country). Again, atheist participants showed higher conjunction error rates for atheist targets, 0.61 (95% HPDI 0.23, 0.95), than for religious targets, 0.50 (95% HPDI 0.12, 0.88) (posterior probability = 0.999). Thus, consistent with theoretical predictions, even atheists intuitively associate immorality more with atheists than with believers.

To address potential methodological confounds and alternative explanations for our findings, we conducted three additional experiments (note that, although our primary cross-cultural investigation was preregistered, the follow-up studies were not). Full details of all three studies appear in the Supplementary Information, but they are briefly summarized here. First, our cross-cultural experimental manipulation tested only extreme moral violations and pitted a target who ‘does not believe in god(s)’ against a ‘religious believer’, perhaps confounding notions of belief in god(s) and the broader construct of religiosity. Supplementary Study S1 found that, even when the experiment more symmetrically manipulates belief versus disbelief in god(s) and tests a more minor moral violation (for example, not paying for dinner in a restaurant), people still associate immorality more with atheists than with believers (posterior probability = 0.981).

Second, our primary cross-cultural tests pitted a disbeliever in god(s) against a religious believer. It is possible, however, that people are morally distrustful of disbelievers in general, rather than of people who disbelieve in god(s) specifically. Supplementary Study S2 used the same extreme moral violation as our main analysis and found that people are more likely to assume intuitively that a

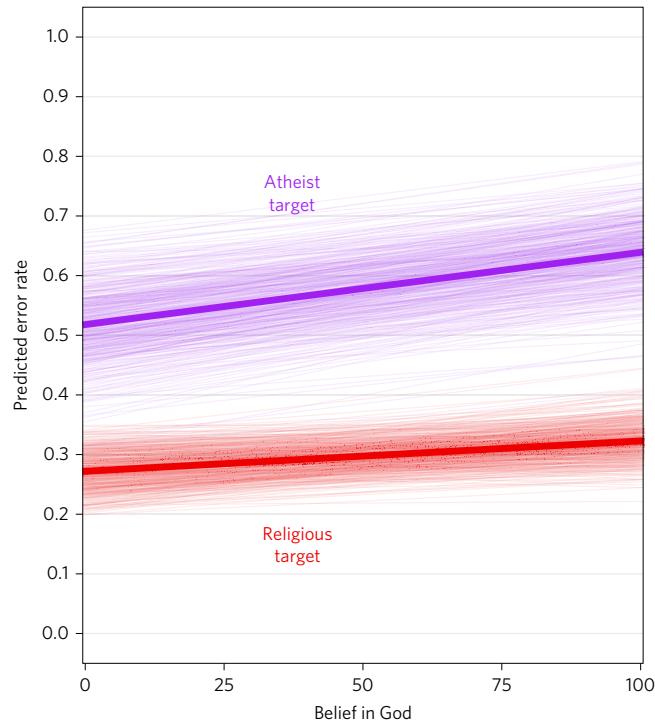


Figure 2 | Predicted effect of participant belief in God, marginalized across countries and adjusting for individual gender, age and subjective socioeconomic status. Bold lines are overall estimates. Blurred lines display 500 best-fit lines sampled randomly from the posterior to depict estimate uncertainty.

perpetrator of moral evil is someone who disbelieves in God than someone who disbelieves in evolution, the accuracy of horoscopes, the safety of vaccines or the reality of global warming (all posterior probabilities between 0.956 and 0.9997).

Finally, it is possible that people may intuitively associate certain specific moral violations, such as child molestation, with religious individuals rather than with atheists. However, Supplementary Study S3 found that people intuitively assume that a priest who molests young boys for decades is more likely to be a priest who does not believe in God than a priest who does believe in God (posterior probability = 0.998).

In summary, participants intuitively assume that the perpetrators of immoral acts are probably atheists. These effects appeared across religiously diverse societies, including countries with Buddhist, Christian, Hindu, Muslim and non-religious majorities, showing that intuitive moral prejudice against atheists is not exclusive to Abrahamic or monotheistic majority societies. To the contrary, intuitive anti-atheist prejudice generalizes to largely secular societies and appears globally evident even among atheists. Notably, our primary experimental paradigm used extreme examples of immorality where anti-atheist prejudice would presumably be less explicitly defensible. We tested moral prejudice using vicious acts of cruelty (animal torture, serial murder and mutilation), which participants—including atheist participants—nonetheless intuitively associated with atheists. Combined, these results show that across the world, religious belief is intuitively viewed as a necessary safeguard against the temptations of grossly immoral conduct, and atheists are broadly perceived as potentially morally depraved and dangerous. Viewed differently, people perceive belief in a god as a sufficient moral buffer to inhibit immoral behaviour.

Our results highlight a stark divergence between lay and scientific perceptions of the relationship between religion and morality. Although religion probably influences many moral outcomes and

Table 2 | Model summary of mean belief in God (50.91 out of 100).

	N	Atheist	Religious	Relative risk	Pr(A > R)
Total	3,256	0.58 (0.48, 0.68)	0.30 (0.25, 0.34)	1.96 (1.53, 2.37)	>0.999
Australia	158	0.54 (0.43, 0.65)	0.29 (0.22, 0.37)	1.89 (1.33, 2.55)	>0.999
China	207	0.7 (0.62, 0.79)	0.43 (0.32, 0.53)	1.65 (1.23, 2.09)	>0.999
Czech Republic	187	0.53 (0.43, 0.62)	0.27 (0.20, 0.34)	1.97 (1.37, 2.66)	>0.999
Finland	993	0.29 (0.25, 0.34)	0.27 (0.23, 0.31)	1.11 (0.89, 1.34)	0.822
Hong Kong	129	0.61 (0.50, 0.71)	0.33 (0.25, 0.43)	1.87 (1.30, 2.48)	>0.999
India	395	0.77 (0.69, 0.83)	0.34 (0.28, 0.41)	2.27 (1.82, 2.74)	>0.999
Mauritius	161	0.55 (0.43, 0.67)	0.28 (0.21, 0.36)	1.96 (1.36, 2.64)	>0.999
Netherlands	213	0.49 (0.40, 0.59)	0.28 (0.21, 0.35)	1.77 (1.23, 2.34)	0.999
New Zealand	161	0.43 (0.33, 0.53)	0.31 (0.23, 0.39)	1.41 (0.92, 1.92)	0.964
Singapore	162	0.75 (0.66, 0.84)	0.29 (0.21, 0.37)	2.63 (1.84, 3.47)	>0.999
United Arab Emirates	144	0.71 (0.60, 0.81)	0.24 (0.15, 0.32)	3.06 (1.95, 4.39)	>0.999
United Kingdom	148	0.48 (0.38, 0.59)	0.30 (0.22, 0.38)	1.65 (1.09, 2.21)	0.997
United States	198	0.64 (0.54, 0.73)	0.26 (0.18, 0.34)	2.56 (1.80, 3.48)	>0.999

Predicted conjunction error probabilities for both atheist and religious targets (95% HPDIs in parentheses), along with relative risks (95% HPDI in parentheses) and posterior probability of atheist target error rates (A) exceeding religious target error rates (R) ($\text{Pr}(A > R)$). Relative risk = $\text{Pr}(\text{atheist target error})/\text{Pr}(\text{religious target error})$.

judgements^{3,22,23}, core moral instincts appear to emerge largely independent of religion^{29,30}. Additionally, highly secular societies are among the most stable and cooperative on Earth¹⁴. Nonetheless, our findings reveal widespread suspicion that morality requires belief in a god. For many people, including many atheists, the answer to Dostoevsky's¹⁸ question "Without God ... It means everything is permitted now, one can do anything?" is "Yes", inasmuch as 'everything' refers to acts of extreme immorality.

Religions underpin large-scale intragroup cooperation³, but they also promote distrust of non-believers^{13,19} who are excluded from such religious moral communities^{3,24}. Does rising secularism^{14,31} moderate effects as atheist norms become stronger within societies? The present findings suggest that intuitive moral suspicion of atheists is culturally widespread, though not universal. Given that intuitive anti-atheist biases may transfer across moral domains¹⁹ (Supplementary Studies S1 and S3), the resilience of moral prejudice against atheists reveals a potential barrier to the full acceptance of this growing segment³¹ of the global population. Consistent with predictions derived from cultural evolutionary theories of religion and morality⁵, extreme intuitive moral distrust of atheists is evident globally, among believers and atheists in both religious and secular societies. Even as secularism reduces overt religiosity in many places¹⁴, religion has apparently still left a deep and abiding mark on human moral intuitions.

Methods

Data collection proceeded among teams acting locally across all 13 countries. Local ethics approval was completed by individual research teams within each country.

The experiment used a version of the representativeness heuristic²⁷. In the classic version of this task, participants are given a description of a politically liberal single woman. When asked whether it is more likely that she is (A) a bank cashier or (B) a bank cashier who is active in the feminist movement, participants tend erroneously to pick option B. Although logically incorrect (there are necessarily at least as many bank cashiers as bank cashiers who are feminists), the description seems more representative of the double identity provided in option B, leading people intuitively to choose that option (termed 'the conjunction fallacy'). By independently varying the contents of the description and the identities implied by option B, researchers can assess the degree to which people intuitively view a given description as representative of different identities¹⁹.

We generated a representativeness heuristic task to quantify the degree to which people around the world intuitively view religion as necessary for the inhibition of grossly immoral behaviour. We provided a description of an immoral person who initially tortures animals and eventually kills people for thrills (see Supplementary Information), and then asked whether it was more probable that

the perpetrator was (A) a teacher or (B) a teacher who either (manipulated between subjects) does not believe in God or is a religious believer. Higher conjunction fallacy rates (picking option B) in the atheist condition indicate that people intuitively view serial murder as more representative of atheists than of religious believers¹⁹. This manipulation allowed us to test the relationship between intuitive distrust of atheists and personal religious belief, while adjusting for country-wide variation in this relationship, as well as demographic covariates.

Analytic strategy. The nested structure of our data required a multilevel (hierarchical) modelling strategy to generate aggregate inferences. Failure to adopt such a strategy can lead to serious and potentially misleading inferential errors³². Our analyses relied on Bayesian hierarchical modelling²⁸ using the rthinking package³³ in R. Bayesian approaches provide researchers with a number of pragmatic benefits³⁴, including the use of intuitive statements (posterior probabilities) about the probability of experimental manipulations producing effects across countries, as well as the relative credibility or plausibility of different potential parameter values^{28,35}. In addition, hierarchical (multilevel) models can mitigate some problems associated with multiple comparisons³⁶—comparisons that could be especially concerning in the present study, which evaluated intuitive moral distrust of atheists across 13 countries while adjusting for individual demographics. Furthermore, Bayesian estimation allowed us to represent the estimate uncertainty using HPDIs, which represent the range in which the most credible parameter values lie. This approach is in contrast to frequentist confidence intervals, which present only a range of possible values that would contain the true parameter value a known proportion of the time were this study repeated a very large number of times, although frequentist confidence intervals are often intuitively misunderstood as if they had the properties of Bayesian posterior density intervals³⁷. Our primary inferences are drawn from probing samples from the posterior from a single hierarchical model. In it, we modelled random intercepts of country and modelled effects of target (atheist versus believer) as random across country, with all other factors fixed across country. Alternative model specifications did not appreciably change inferences.

Data availability. Data and code are freely available at <https://osf.io/f0upy/>

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Author contributions

W.M.G. developed the study design in consultation with all the authors. W.M.G. and J.B. performed the analyses. W.M.G., D.X., M.v.E., J.B. and R.T.M. wrote the manuscript with input from all authors. All authors were involved in data collection.

Additional information

Supplementary information is available for this paper.

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Competing interests

The authors declare no competing interests.