Cultural similarity among coreligionists within and between countries

Cindel J. M. White[a,1], Michael Muthukrishna[b,2], and Ara Norenzayan[c,2]

[a]Department of Psychology, York University, M3J 1P3 Toronto, ON, Canada; [b]Department of Psychological and Behavioural Science, London School of Economics and Political Science, WC2A 2AE London, United Kingdom; and [c]Department of Psychology, University of British Columbia, V6T 1Z4 Vancouver, BC, Canada

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Cultural evolutionary theories suggest that world religions have consolidated beliefs, values, and practices within a superethnic cultural identity. It follows that affiliation with religious traditions would be reliably associated with global variation in cultural traits. To test this hypothesis, we measured cultural distance between religious groups within and between countries, using the Cultural Fixation Index (CF_{ST}) applied to the World Values Survey (88 countries, n = 243,118). Individuals who shared a religious tradition and level of commitment to religion were more culturally similar, both within and across countries, than those with different affiliations and levels of religiosity, even after excluding overtly religious values. Moreover, distances between denominations within a world religion echoed shared historical descent. Nonreligious individuals across countries also shared cultural values, offering evidence for the cultural evolution of secularization. While nation-states were a stronger predictor of cultural traits than religious traditions, the cultural similarity of coreligionists remained robust, controlling for demographic characteristics, geographic and linguistic distances between groups, and government restriction on religion. Together, results reveal the pervasive cultural signature of religion and support the role of world religions in sustaining superordinate identities that transcend geographical boundaries.

religion | culture | cultural evolution

Religious traditions are an important element of the world's cultural diversity, and deeply intertwined with many other cultural traits (1). Beliefs, values, and practices centered around these traditions have been hypothesized to foster a superordinate shared identity, with a corresponding package of cultural traits, shared across geographic and ethnic boundaries (2–6). It follows from this hypothesis that there is some degree of cultural similarity between coreligionists across the world. We test this hypothesis by comparing the cultural distance of coreligionists to noncoreligionists within and between countries. We also assess how the cultural distance of coreligionists compares to the cultural distance of conationals. We measure cultural distance using the Cultural Fixation Index [CF_{ST} (7)] applied to responses provided by 243,118 individuals from 88 countries who completed the World Values Survey (8) (WVS) in three waves between 2005 and 2019.

Previous research has documented many ways in which variation in cultural traits can be traced to variation across religious groups and to their particular beliefs and practices. Religious traditions bind people together into moral communities by transmitting cultural norms about what is considered right, good, and true (9). Religious group differences have been found to predict a variety of social judgments and behaviors, moral values, familial ties, personality traits, educational attainment, and economic preferences (1, 10–14). Across many countries, more religious people (e.g., those with stronger belief in God and the afterlife) tend to moralize a wider range of behaviors than do nonreligious individuals (15, 16). For example, more religious individuals often care about sexual morality, whereas nonreligious individuals tend to be more permissive (17–27). Religious commitments predict attitudes toward family (28), with certain religious traditions predicting stronger family ties [e.g., percentage of Muslims within a country (29)] and others predicting a loosening of kinship ties and greater individualism [e.g., history of exposure to the Roman Catholic Church (30)]. Religious commitment and ritual participation is related to greater cooperative tendencies (31) [e.g., participation in the Kavadi, an annual Hindu festival involving intense rituals and devotions, is associated with greater generosity among Tamil diaspora communities (32)]. Across cultures and religious traditions, individuals who are committed to a more punitive, morally concerned god behave more generously toward coreligionist strangers in economic games (33, 34), and belief in various forms of supernatural punishment play a role in the evolution of social complexity (35). And in judgments of moral transgressions, Protestants (i.e., members of a religious tradition that places great importance on personal beliefs) tend to emphasize transgressors' intentions and character traits, whereas Jews, Catholics, and Hindus (i.e., traditions that tend to care more about religious practice) prioritize the outcomes of transgressors' behavior (36–39).

Exposure to particular religious traditions is also related to people's orientations toward education and economic pursuits. For instance, the presence of Mainline Protestant denominations in a society often spreads proeducation, promarket economic attitudes that manifest in greater educational attainment and/or economic prosperity cross-nationally (40–44) [see also, specific

Significance

Do people who affiliate with the same religious tradition share cultural traits even if they live in different countries? We found unique patterns of cultural traits across religious groups and found that members of world religions (Christianity, Islam, Judaism, Hinduism, and Buddhism) show cultural similarity among coreligionists living in different countries. People who share a particular religious tradition and level of commitment to religion were more culturally similar, both within and across countries, than those that do not, even after excluding overtly religious values. Despite their heterogeneity, religious denominations reflect superordinate cultural identities, and shared traits persist across geographic and political boundaries. These findings inform cultural evolutionary theories about the place of religion and secularity in the world's cultural diversity.

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[1]To whom correspondence may be addressed. Email: cjmwhite@yorku.ca.

[2]M.M. and A.N. contributed equally to this work.

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case studies of Germany (45), Guatemala (46), China (47), and Africa (48)]. A similar influence has been documented for 18th-century Jesuit missions among indigenous populations on educational attainment in Argentina, Paraguay, and Brazil (49). The Protestant heritage of the United States may likewise help to explain the value Americans' place on religious traditionalism, individualism, and moralization of work (often referred to as the "Protestant work ethic") (50, 51). Conversely, the spread of religions is shaped by existing features of societies [e.g., political leadership structures and group size is implicated in the rates at which Christianity expanded among Austronesian societies (52)].

While there is mounting evidence from different fields that religious traditions and cultural preferences are importantly linked, secularization in many parts of the world and in subcultures within countries have also been linked to shifts in cultural norms, beliefs, and values (16, 53–56). However, the extent and significance of secularization continues to be hotly debated, with some proposing that secularization is not a significant phenomenon and that it has not fundamentally altered cultural values and practices (57, 58). Therefore, the current study offers a way to test of whether nonreligious individuals share cultural values within and across nations, consistent with the secularization thesis.

Parallel to the findings about the role of religious traditions, a large and diverse body of work shows that shared nationality also shapes values, beliefs, behaviors, and norms. For example, despite large population size and regional diversity, Americans living in different states look quite similar in their cultural values, and quite different from those living outside the United States (7). Shared nationality is an important predictor of a wide range of outcomes, including behavioral (59, 60), social (61, 62), and economic trends (63). We did not have strong a priori theoretical expectations about the relative strength of affiliation with nation-state versus religion in predicting cultural traits; we therefore treated this as an open question in the present study.

The WVS has been foundational in attempts to map broad patterns of cross-country cultural variation in human values, beliefs, and preferences. It has been used extensively to document the consolidation of cultural values and beliefs within nation states (64). Early work using the WVS has also shown that a country's dominant religious tradition is a good predictor of that country's cultural values. Using the 1995 to 1998 waves of the WVS, Inglehart and Baker (65) identified two major dimensions in which countries vary—traditional versus secular-rational values and survival versus self-expression values—and found that countries classified along these two dimensions tend to fall into clusters that can be identified by their dominant religious histories. For example, separate clusters could be identified for historically Catholic, Protestant, and Orthodox European countries, and Confucian countries clustered separately from other Asian nations. Here, we build on this landmark study and address several of its limitations. We draw on a much-larger sample of countries, measure religion at the individual level rather than only at the country level, make use of the newly developed CF_{ST}, and compare the relative importance of religious denominations within and across countries.

In the present research, we explore whether religious denominations correspond to broad patterns of variation in cultural values, using responses provided by 243,118 individuals from 88 countries who completed the World Values Survey (WVS) between 2005 and 2019. To measure cultural distance, we use the CF_{ST} measure (7). F_{ST} was originally designed as a measure of genetic distances between populations (66, 67) but can be applied to measure distances between any theoretically interesting cultural groupings along any desired dimensions. Muthukrishna et al. (7) applied the F_{ST} measure to cultural traits represented in the WVS to create the CF_{ST} and found that cultural distance between countries predicts meaningful cross-country variation in psychological outcomes. To assess the pattern of cultural distances between religions, the present research likewise applies the CF_{ST} measure to the WVS, but to religious denominations instead of countries. In some analyses, we further subset by level of religiosity and countries (to compare religious groups between and within countries).

While there are strong reasons to expect that religious affiliation is an important predictor of global cultural variation in values, beliefs, and preferences, this is not a foregone conclusion. Alternatively, we may find that differences between countries overwhelm any similarities between members of the same religious traditions who live in different countries (68). That is, religious denominations could be more an identity label than a cultural group, and the extant diversity within broad categories such as "Christianity" or "Buddhism" might be too large to allow for overarching cultural traits. Perhaps local factors exert an overwhelming influence on a person's cultural values that leaves little room for one's religious tradition. For example, in studies of European countries, national cultures are a far better predictor than religion of the perceived importance of various virtues (69) and definitions of wisdom (70). Or perhaps, even if a religious tradition does predict cultural traits, it might only predict a person's supernatural beliefs, ritual practices, and certain moral attitudes that are deeply intertwined with religious doctrines (e.g., attitudes toward euthanasia and norms about sexuality); beyond these belief-related traits, the effect of religion may not be detectable. Finally, it may be the case that simply being religious—of any denomination—has the largest effect on cultural traits and that specific religious traditions do not contribute beyond this. To test this, we also computed cultural distances between groups defined by their degree of religiosity.

The present study investigated whether religious denominations, measured at the individual level, predict global variation in cultural values. We compare the relative predictive power of sharing a nation and sharing a religious tradition on cultural distance between groups. We test the preregistered hypotheses that within a country, members of different religious denominations will be culturally distant, and across countries, those that share a religious tradition will be more culturally similar than those affiliating with different traditions.

We assessed these patterns of global variation in cultural values across different religious denominations that have historically supported large-scale cooperation through a suite of mechanisms such as rituals, devotions, and fictive kinship, including supernatural punishments and rewards [God for Jews, Christians, and Muslims (4, 33, 34); karma for Hindus and Buddhists (5, 71)]. Next, we compared individuals with no religious affiliation to religious individuals of any denomination to test whether people distanced from any religion across nations shared cultural values reflecting secularization. We also assessed whether there is any interaction between one's level of religiosity (e.g., the importance of religion in one's life or frequency of attending religious services) and their particular religious denominations (i.e., individuals who share a denomination may only be similar if they are highly committed to their religion). Finally, we tested the robustness of these results controlling for individual-level (e.g., age), national-level (e.g., government restrictions on religion), and cross-national factors (e.g., geographic distances between countries) that often covary with religion and could also be related to the degree of cultural similarities between groups. Prior to conducting any analyses regarding cultural distances between religions, the methods and analysis plan were preregistered on the Open Science Framework (https://osf.io/j4v2s/). We specify when our results were exploratory or when they deviated from the preregistration. We disclose all data exclusions, alternative analyses, and measures (in the article and in the accompanying *SI Appendix*).

Results

Cultural Distances across Religious Denominations. The first preregistered analysis investigated the cultural distance between members of different religious denominations, collapsed across all countries, after aggregating the individual religious

denominations available in the dataset into one of the following categories: Christian, Muslim, Jewish, Hindu, Buddhist, Spiritualist and pagan, Druze, Daoist, Native or Folk religion, Ancestral Worshipping, no religious denomination, or other (see *SI Appendix* for full details). These categories ensured sufficient sample sizes and some uniformity in category options across countries, while retaining major distinctions between religious traditions. We calculated the Cultural F_{ST} (CF_{ST}) statistic to quantify the overall size of cultural differences between two groups, on a scale that can range from 0 (when populations are identical) to 1 (when populations are completely different). Larger CF_{ST} values indicate greater differences between the distributions of cultural traits in each group [between countries, human populations overlap considerably with a typical range from 0 to 0.3, suggesting more overlap than difference (7)]. For the focal analyses presented in the main text, we exclude any cultural traits that overtly describe a person's religious beliefs (e.g., belief in God, belief in life after death, or frequency of prayer) and may therefore exaggerate the strength of association between religious traditions, religiosity, and global variation in cultural traits. The *SI Appendix* also contains additional analyses that follow our original preregistered plan by using the full set of WVS variables (including religious beliefs), as well as a more conservative preregistered test that excludes all overtly religious content as well as the moral values and social norms that are not inherently religious but often cluster with a person's religious beliefs (e.g., disapproval of homosexuality or abortion and meaning and purpose in life). Similar patterns were found using all three analytic choices, although the associations are somewhat reduced when religious and moral values are excluded from the set of cultural traits.

The pairwise cultural distances between each of these groups are depicted in Fig. 1. Additional analyses were conducted that retained separate categories for Roman Catholic, Orthodox, and Protestant/other Christian denominations (any other subdenominations of

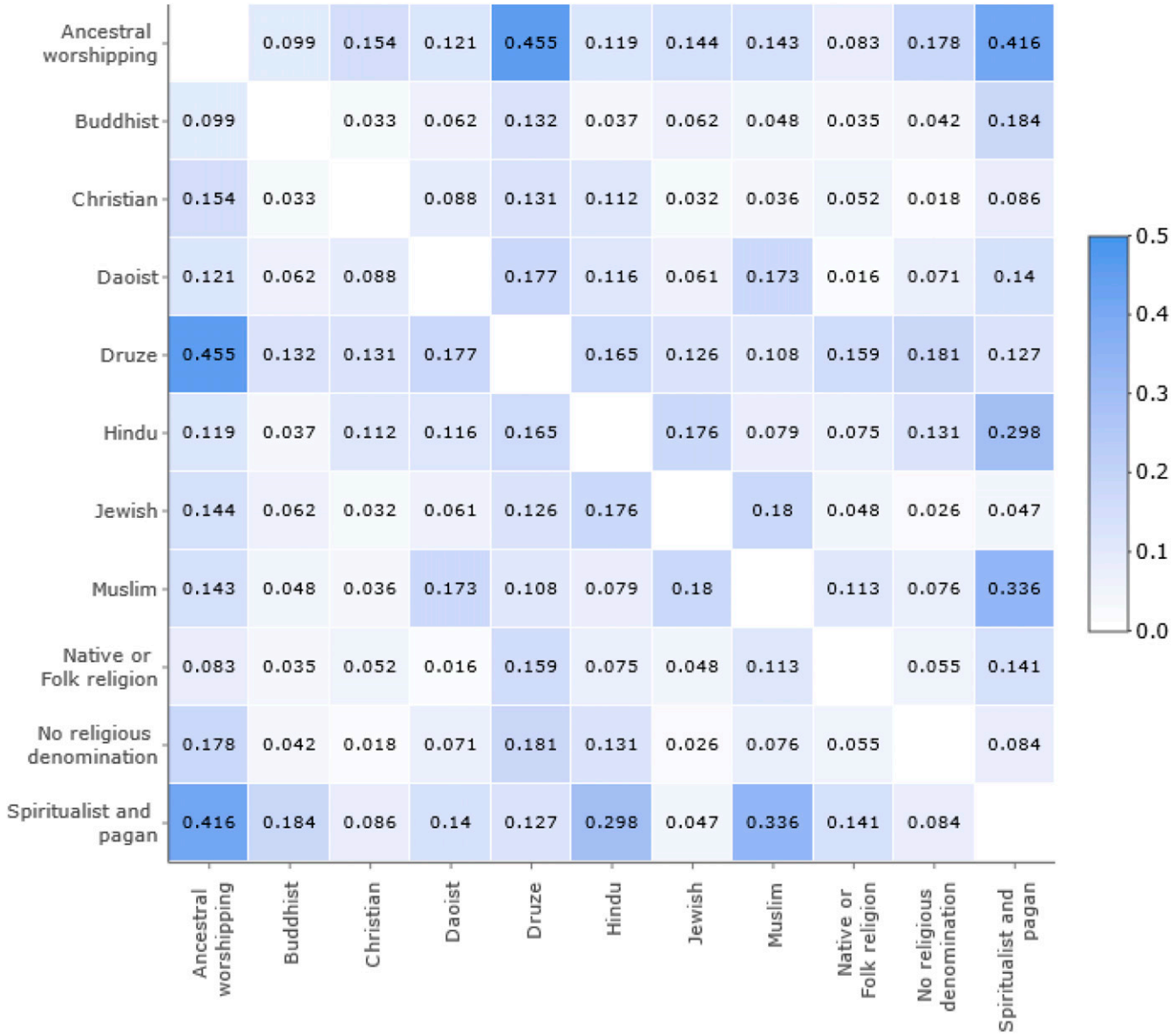

Fig. 1. Cultural distance between religions, excluding overtly religious traits. Identical values are replicated in the *Upper* and *Lower* diagonal, with values shaded from closest (white) to most distant (blue).

major world religions were not present in sufficient numbers across countries for a meaningful analysis, see *SI Appendix*, Table S1).

The pattern of cultural distances between religions, across countries, reflected several patterns of known historical connections between religious groups. For example, Christians were highly similar to members of other Abrahamic faiths (Jews and Muslims), and more culturally distant from Hindus, Daoists, Spiritualists/Pagans, and Ancestor Worshippers. Subdenominations of Christianity were also highly similar to one another: Roman Catholics were highly similar to Protestant/other Christians (CF_{ST} = 0.005 [0.005, 0.006]) and slightly more distant (but still pretty similar to) Orthodox Christians (CF_{ST} = 0.056 [0.018, 0.079]). Buddhists tended to be quite similar to both traditional Eastern (Daoist and Native/Folk religion) and Dharmic traditions (Hindu) and less obviously to Christians (see *SI Appendix* for further analyses of this similarity). It is noteworthy that in the larger context of the world, the Big Five world religions (Christianity, Islam, Judaism, Hinduism, and Buddhism) shared a high degree of cultural similarity and were collectively more distant from followers of Ancestral Worship and Spiritualist/Pagan traditions (mean cultural distance within the five world religions was CF_{ST} = 0.079; mean distance from the five world religions to Ancestral Worship was CF_{ST} = 0.132 and to Spiritualist/pagan traditions was CF_{ST} = 0.190).

Secondary analyses confirmed that these global patterns occur across a variety of cultural value dimensions [i.e., financial, group membership, law, political, sexuality, and social relationship dimensions identified by Muthukrishna et al. (7)], not only those pertaining to the religious beliefs. The average distance between religious denominations is largest when including all values, including overtly religious beliefs (CF_{ST} = 0.151), and lowest when excluding all religious, moral, and norm-related beliefs (CF_{ST} = 0.112), but the overall pattern of distances between members of different religious traditions was retained even after dropping these belief variables (see the *SI Appendix* for full results and for exploratory analyses conducted separately on each dimension of the WVS).

Cultural Distances across Countries and Religious Denominations. The second preregistered analysis investigated the relative contribution of sharing a religious denomination and sharing a country in predicting cultural distances between groups. To answer this question, we computed the pairwise cultural distances between members and nonmembers of a given religious denomination within and across all countries. Separate analyses were conducted by splitting the sample into members versus nonmembers of four denominations: Christians versus all non-Christians; Muslims versus all non-Muslims; Buddhists versus all non-Buddhists; and Hindus versus all non-Hindus. For example, the Christian analysis provided us with an estimate of the cultural distance between 1) Christians versus all non-Christians within each country, 2) Christians who live in different countries, and 3) Christians versus all non-Christians who live in foreign countries. Distances were computed for each country-by-religion pair and then averaged across countries (according to preregistered exclusion criteria, this necessitated dropping data from any religious groups with fewer than 100 members/nonmembers within a country). The results of this analysis are presented in Fig. 2, and a similar pattern was found for splits based on Christian, Muslim, Hindu, and Buddhist. Additional analyses excluding the entire moral beliefs dimension of cultural values also shows a similar pattern and are available in *SI Appendix*, Figs. S2 and S3.

Within each country, members of a religious tradition were quite similar to members of other religious traditions living within the same country. But does sharing a religious tradition predict cultural similarity, above and beyond country-level differences? Yes. Although the effect of sharing a religion was smaller than the effect of sharing a country (red points versus blue points in Fig. 2*A*), individuals who share a religious denomination were, on average, more similar than individuals who differ in both their religion and their country (blue points versus green points in Fig. 2*A*). For example, Christians living in China were quite similar to Buddhists living in China (CF_{ST} = 0.015 [0.015, 0.029]), but across nations, Christians in Mainland China tended to be more similar to other Christians in Taiwan (CF_{ST} = 0.055 [0.052, 0.073]) and Singapore (CF_{ST} = 0.067 [0.062, 0.081]) than they were similar to Buddhists in Taiwan (CF_{ST} = 0.076 [0.072, 0.091) and Singapore (CF_{ST} = 0.085 [0.079, 0.100]). The stronger effect of national culture was apparent even in cases where there is ongoing within-country religious conflict, such as between Hindus and Muslims within India (72, 73). Muslims in India were more similar to Hindus in India (CF_{ST} = 0.006 [0.006, 0.014]) than to Muslims in Pakistan (CF_{ST} = 0.148 [0.135, 0.168]). Similarly, despite a history of interreligious tensions, Lebanese Christians and Muslims were culturally similar (CF_{ST} = 0.008 [0.008, 0.011]) and more similar to each other than Lebanese Christians and Egyptian Christians (CF_{ST} = 0.115 [0.107, 0.131]) and Lebanese Muslims and Egyptian Muslims (CF_{ST} = 0.168 [0.16, 0.179]).

This pattern was consistent for analyses based on adherence to Christianity, Islam, Buddhism, and Hinduism, although exploratory analyses indicated that some religious denominations predict greater similarity across nations than do others. Interestingly, coreligionists across countries were more similar if they were Roman Catholic (CF_{ST} = 0.117 [0.113, 0.120])—a religion with a long history of top-down influence across countries from a centralized authority—or less obviously, Orthodox (CF_{ST} = 0.092 [0.082, 0.101]) rather than Protestant and other Christian denominations (CF_{ST} = 0.134 [0.130, 0.139]), which have historically existed as more dispersed and autonomous groups.

Cultural Distances across Levels of Religiosity. The preceding analyses showed that cultural similarities between religious denominations were evident between coreligionists living in different countries, and this pattern was present for Christians, Muslims, Hindus, and Buddhists. Our next preregistered analyses tested the possibility that cultural similarity may also be predicted by greater religious involvement, resulting in cultural distance between religious and nonreligious individuals regardless of their specific religious denomination. We tested this by splitting the sample, across countries, into high-religiosity and low-religiosity groups based on three different criteria—importance of religion in one's life, frequency of attendance at religious services, and whether they selected "no religious denomination" as their religious affiliation (see Fig. 2*B*). According to each of these criteria, we found that highly religious and nonreligious individuals were slightly different within each country, and those who share a level of religiosity across countries were more similar than those who differ in level of religiosity across countries. Average cultural distances between those with no religious denomination across countries (CF_{ST} = 0.140 [0.128, 0.152]) is a little larger but comparable to cultural distances between individuals with the same religious denomination across countries (Christian CF_{ST} = 0.120 [0.112, 0.129], Muslim CF_{ST} = 0.118 [0.106, 0.130], Buddhist CF_{ST} = 0.100 [0.085, 0.115], and Hindu CF_{ST} = 0.121 [0.098, 0.153]). This supports the conclusion that level of religious commitment (regardless of the specific religion) also predicts cultural distance, above and beyond the predictive potential of belonging to specific religious traditions. In some cases, sharing a level of religious commitment was even more consequential than sharing a religious denomination. For example, within India, Hindus who reported that religion was very important were more similar to Indian Muslims who reported that religion was very important (CF_{ST} = 0.007 [0.007 0.016]) than they were to Indian Hindus who reported religion was not important (CF_{ST} = 0.029 [0.025, 0.039]).

Interestingly, when we grouped religious traditions into broad categories with shared cultural ancestry—Abrahamic (Christian, Muslim, or Jewish), Dharmic religious denominations (Hindu or Buddhist), as well as nonreligious (no denomination)

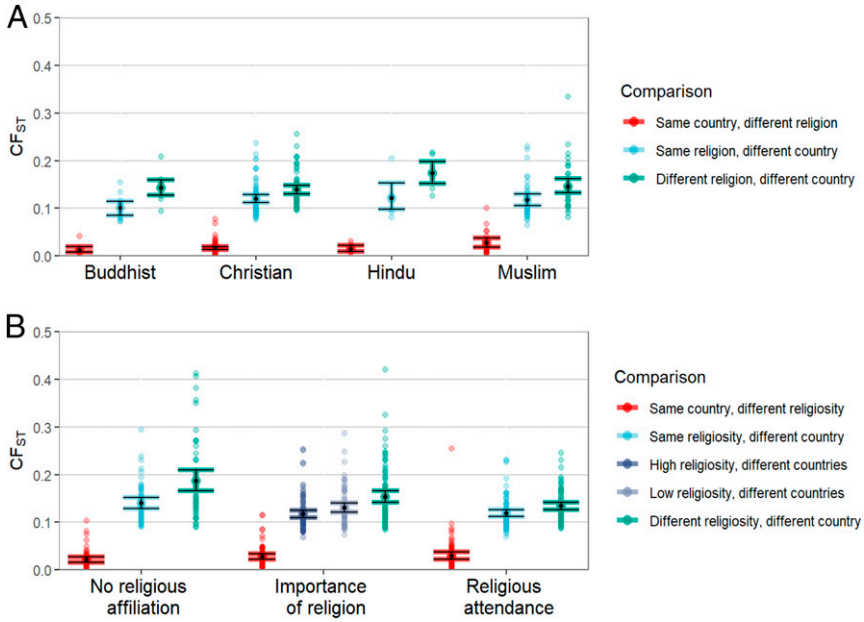

Fig. 2. (*A*) Cultural distance between 1) in red: coreligionists and members of all other denominations within a country; 2) in blue: coreligionists within a country to coreligionists in foreign countries; and 3) in green: coreligionists and members of all other denominations in foreign countries. (*B*) Cultural distance between 1) in red: individuals with high versus low religiosity within a country; 2) in blue/violet: individuals who share high a level of religiosity (high or low) across countries; 3) in green: individual high versus low in religiosity across countries. "Religiosity" was calculated using three separate methods: choosing "No religious denomination" as their religious affiliation, importance of religion in life, and attendance at religious services. All values were computed separately for each country (colored data points) and an average value across countries (with bootstrapped 95% CIs, in black).

individuals—members of Abrahamic and Dharmic denominations were more similar to each other across different countries (CF_{ST} = 0.149 [0.139, 0.160]) than they were to individuals with no religious denomination: Abrahamic versus no denomination across countries CF_{ST} = 0.181 [0.166, 0.199]; Dharmic versus no denomination across countries, CF_{ST} = 0.161 [0.137, 0.187]. This also replicates the finding reported earlier that the Big Five world religions show cultural similarities.

We also computed the pairwise cultural distances between all religious denominations (collapsed across countries) after splitting the sample into those high in importance of religion and low in importance of religion. The average cultural distance between denominations was approximately the same within the sample who considered religion highly important (CF_{ST} = 0.122 [0.105, 0.142]) and within the sample who considered religion not important (CF_{ST} = 0.103 [0.089, 0.117]), whereas the distance was larger when comparing the high-importance and low-importance samples across denominations (CF_{ST} = 0.155 [0.130, 0.184]) (see *SI Appendix*, Table S9 for full details). That is, sharing a level of commitment to religion, as well as sharing a religious affiliation, predicted greater cultural similarity.

In what ways do religious and nonreligious people differ? The overt religious and moral content of some cultural values was an important part of the story: All religious groups differ from those with no religious denomination by at least CF_{ST} = 0.130 along the dimension of religious/moral beliefs (CF_{ST} > 0.125 when explicitly religious beliefs were removed, but moral/norm attitudes were retained in this category). However as depicted in Fig. 3, religious groups also differ from nonreligious individuals across many other dimensions of culture. Some groups only

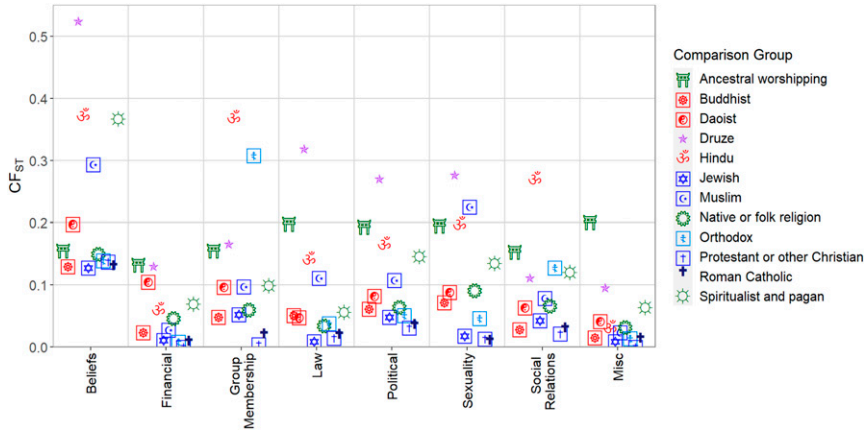

Fig. 3. Cultural distance between each religious group and those with no religious denomination, for each separate dimension of cultural values. Additional figures, displaying results across dimensions for each religious denomination as the reference group, are available in the *SI Appendix*.

differ by a little. In general, Christians, Jews, and Buddhists were quite similar to nonreligious individuals along many dimensions. But other groups differed by quite a lot. For example, the distance between Hindu, Druze, and Ancestral Worshiping groups and nonreligious groups was as large, along many dimensions, as the distance between Christian and nonreligious groups on the religious/moral belief dimension.

Cultural Distances According to Level of Religiosity across Countries and Religious Denominations. The final preregistered analysis investigated the combined influence of shared country, shared religious denomination, and shared importance of religion as predictors of cultural distance. We found no evidence for the hypothesis that similarity across religious denominations was only present among highly religious individuals; rather, individuals who shared both a religious denomination and who shared the same level of religious commitment (be it high or low) tended to be more similar to each other than to individuals with a different denomination or with a different level of commitment across countries. Results, depicted in *SI Appendix*, Figs. S4–S6, revealed unique contributions of all three factors: Individuals within a country were more similar than individuals across countries (the largest effect), but individuals were also more similar if they shared a religious denomination and a level of religiosity than if they differed in their denomination or level of religiosity. For example, there was more cultural similarity among Muslims living in different countries who agreed that religion is highly important (CF_{ST} = 0.116 [0.104, 0.129]) as well as among those who agreed that religion was not important (CF_{ST} = 0.094 [0.083, 0.108]), whereas the cultural distance was larger between highly religious Muslims and nonreligious Muslims living in different countries (CF_{ST} = 0.148 [0.129, 0.169]). Sharing a level of religious commitment predicted additional similarity, beyond the effect of shared denomination. As in the preceding analysis, the same pattern tends to appear if moral, as well as religious, beliefs are excluded from the set of cultural values.

Robustness Checks. We conducted three sets of exploratory analyses (documented in detail in the *SI Appendix*) to address alternative explanations for our findings. The first was to confirm that our results were not driven by self-assortment, the second to confirm that our results are not better explained by demographic variables, and the third to confirm that our results are not better explained by geographic, linguistic, or genetic distances between groups.

Country-Level Restrictions on Religious Freedom. We conducted exploratory analyses to examine whether these patterns can be explained by self-assortment. It is possible that individuals who are committed to a certain set of beliefs and preferences (e.g., meaning and purpose in life or disapproval of euthanasia) may subsequently choose to join a religion that reflects these attitudes. If so, then we would expect similarity among coreligionists in countries with high religious freedom but not in countries where religion is more tightly constrained. Contrary to this explanation, there was little association between government restriction of religion and the degree of cultural distance among coreligionists. The greater cultural similarity among coreligionists compared to people who do not share a religion was present in both countries with high levels of religious freedom (same religion: CF_{ST} = 0.115; different religion: CF_{ST} = 0.156, averaged across Christian, Muslim, Hindu, and Buddhist splits) and countries with less freedom and more government restrictions on religion (same religion: CF_{ST} = 0.116; different religion: CF_{ST} = 0.146, averaged across splits; *SI Appendix*, Figs. S9–S11) (74). While causal inference is not feasible given the observational nature of the data, this finding is more consistent with the hypothesis that cultural similarity among coreligionists is the result of exposure to religious traditions that have a consolidating effect on cultural traits, not merely individuals choosing to affiliate with particular traditions.

Demographic Variables. We considered whether these patterns hold across other demographic variables that may be associated with religious affiliation. Similar patterns were documented when we separately analyzed distances between younger individuals and distances between older individuals, and the degree of cultural distance between religious groups within a country was uncorrelated with the degree of cultural distance between age groups, socioeconomic classes, regions, or ethnic groups within a country.

Geographic, Linguistic, and Genetic Distances. The greater similarity between coreligionists across countries also cannot be explained by geographic, genetic, or linguistic distances between countries. To test these possibilities, we assessed whether these variables predict the set of pairwise cultural distances between all distinct country/religion groups, and whether cultural distances between religious groups predict additional unique variance beyond these factors. We assessed these relationships using both a Multiple regression on distance matrices (MRM) approach and using a multilevel model (that predicted these distances in a beta distributed model that included clustering of observations within religions and countries). Both analyses (described in full in the *SI Appendix*) indicated that small associations do exist between our focal cultural distance variable and geographic, linguistic, and genetic distances between groups. However, cultural distances between religious groups, and cultural distances between countries, predicted substantial additional unique variance, after accounting for these geographic, linguistic, and genetic differences. For example, within South Africa, where sufficiently large sample sizes of different linguistic groups were available, Protestant Christians were more similar to fellow Protestants who speak different languages (average CF_{ST} = 0.0245) than they were to non-Protestants who speak different languages within the country (average CF_{ST} = 0.0406), although all groups living within the same country tended to be quite similar to one another (between linguistic groups, average CF_{ST} = 0.0299, maximum CF_{ST} = 0.116).

Which Religious Denominations Are Most Similar to the United States? We also conducted exploratory analyses of the cultural distance between the United States and members of each religious denomination who live outside of the United States. The United States is a prototypically Western, Educated, Industrialized, Rich, and Democratic (WEIRD) society in which the majority of psychological and other behavioral science research is conducted (75, 76), and cultural distance from the United States has been found to predict cross-national variation in several psychological outcomes [i.e., individualism, extraversion, egalitarianism, tightness/looseness, and prosocial behavior (7)]. As depicted in *SI Appendix*, Tables S7 and S8, of all the religious groups outside of the United States, non-American Christians were the most culturally similar to Americans (particularly Protestant denominations CF_{ST} = 0.061 [0.059, 0.064] compared to Catholic CF_{ST} = 0.086 [0.084, 0.90] or Orthodox Christian denominations CF_{ST} = 0.107 [0.104, 0.111]). Non-Americans with no religious denomination were also culturally similar to Americans when overtly religious traits were excluded from analyses (CF_{ST} = 0.056 [0.054, 0.059]), although the distance between Americans and non-Americans with no denomination was somewhat larger when including religious traits (CF_{ST} = 0.105 [0.102, 0.109]). This result is consistent with the previously documented pattern that the United States is quite similar to other secular, developed nations on many dimensions, except when it comes to traditional religious values (53, 65, 77).

Discussion

In the larger context of the world, there was considerable cultural convergence among adherents of the world religions (Hinduism,

Buddhism, Christianity, Islam, and Judaism) that together comprise the vast majority of the world's population (56). The results also supported the hypothesis that religious affiliation and level of commitment to religion (irrespective of the particular tradition) are meaningful predictors of global variation in cultural values, beliefs, and preferences. Moreover, differences between countries were several times larger than differences between religious groups within a country—an interesting finding that was not predicted in advance. This was even the case for countries with a history of interreligious tensions, such as India and Lebanon. These two findings, taken together, indicate that despite contemporary anxieties about religious divides around the globe (78), world religions share a great deal of cultural traits and the experience of living in nation-states continues to be more consequential than exposure to religions, at least when it comes to shared cultural values. These findings may indicate that 1) religious conflict is not necessarily accompanied or caused by greater cultural distance or 2) that other factors, such as feelings of group identity, rather than cultural distance, may be more important in intergroup conflict. The cultural distances between religious groups in previous conflicts, such as late–20th-century conflicts in Ireland and Sri Lanka may shed light on this issue and improve our understanding of the dynamics among groups that are unified by religion as well as politics.

Nevertheless, religious traditions also displayed robust, measurable differences in cultural values, beyond observed national differences. Within a country, individuals with different religious denominations and different levels of religiosity were more culturally distinct, and these distances between religious denominations were as large or larger than cultural distances between other demographic groups, such as those defined by one's ethnicity, region, or level of education, status, or income (*SI Appendix*, Fig. S16). Across countries, those who share a religious denomination or level of religiosity were more similar than those with different religious denominations and different level of religiosity. As a result, and despite living in different national cultures, people who do not affiliate with any religion shared cultural traits to some degree. This pattern is consistent with the cultural evolution of secularization (53) and conforms with previous research on the causes and consequences of religious decline that is occurring in some parts of the world (55, 79). Interesting open questions remain, however, about whether a global secularized culture is emerging, and if so, what explains it.

These cultural differences appeared across a range of values (e.g., political and economic attitudes, preferences for social relationships, and important qualities to instill in children), not merely those that contain overtly religious content, thereby indicating that sharing a religious denomination has a broad association with cultural traits. These patterns of religious cultural distances were robust to demographic variables and could not be explained by other potential influences on cultural traits, such as geographic or linguistic proximity between populations. In addition, cultural similarity among coreligionists was unmoderated by the degree to which governments restrict religious freedom. This finding speaks against the self-assortment hypothesis—the idea that cultural similarity among coreligionists is mainly driven by people possessing certain beliefs and preferences selecting themselves into a religious tradition that reflects these traits. Contradicting this, religion predicted cultural traits equally in more-restrictive as well as less-restrictive countries. However, these analyses cannot definitively determine the causal directions between religious traditions and cultural traits and vice versa (80), nor do they specify how religion may coevolve with a broader package of cultural traits that are impacted by underlying factors, such as when religious beliefs and practices might adapt to particular societal ecologies (81, 82). These are important questions for future research regarding the cultural evolution of religion and culture, which require richer historical data and more-extensive longitudinal and phylogenetic analyses (83–85).

The present research also has methodological and theoretical implications that inform sampling choices in designing future studies in the behavioral sciences and further our understanding of human behavioral diversity. For example, the United States is a canonically WEIRD country overrepresented in behavioral science research (75). We found that of all the religious denominations outside of the United States that we looked at, Christians (especially Protestants) showed the smallest cultural distances to Americans, suggesting that affiliation with Christian denominations around the world is to some extent related to WEIRD psychology (14, 30), an important point that is often masked in cross-cultural comparisons of human behaviors and preferences. Moreover, researchers could utilize cultural distances to improve sampling from religiously diverse populations to test the extent of cross-cultural generalizability of psychological findings and theories.

There are important limitations to the present analyses. We utilized a large cross-cultural dataset to depict cultural differences between broad categories of major world religions, but despite the overall very large sample size, the available data limited our ability to assess cross-national cultural distances for smaller religious groups or subdenominations within broader religious traditions. By aggregating over many different denominations of Christianity, Islam, Hinduism, or Buddhism, our results may exaggerate the size of cultural distances between coreligionists, whereas coreligionists may be more similar when they share a specific denomination (e.g., Catholic Christians were a little more similar, on average, than were members of any Protestant Christian denomination). We were also unable to analyze several other prevalent religious denominations (e.g., Sikh) due to a lack of representation across the entire dataset. Future research could apply the techniques used here to investigate cultural distances between more-specific religious denominations when additional data becomes available from these groups. Another limitation is that the present study is a snapshot that does not account for the dynamic nature of religious traditions that change over time, a question that future research can address using historical data. Future research is also needed to assess the degree to which these findings, which are based on the well-established WVS, are robust and replicable across other datasets that measure cultural values and preferences. The WVS presents the ideal data for a first test of these patterns by surveying a variety of cultural traits (even if not an exhaustive set).

Religious affiliation and intensity of religious commitment are linked to global variation in cultural traits. In particular, people who share a religious denomination within and across countries were more culturally similar than those with a different religious denomination. The clustering of cultural traits by religious groups across geographic and linguistic distances is consistent with religion's role in the cultural evolutionary dynamics of large-scale cooperation and competition, as previous theories have hypothesized (4, 14). Moreover, these findings add evidence to recent efforts documenting that cultural diversity is orders of magnitude larger than genetic diversity in human populations (7, 66, 86), thereby allowing intergroup competition and multilevel selection to play a role in human cultural evolution. However, we emphasize that religious traditions are not static or homogenous—they evolve over time in response to various social, demographic, political, and ecological pressures, which may result in corresponding changes in cultural values, beliefs, and preferences. Overall, these results highlight the importance of religion and secularity—besides country-level differences—as a meaningful part of humanity's considerable cultural diversity.

Methods

Data Source. Data were drawn from the WVS (8), Waves 5 to 7 (2005 to 2019). These datasets contain responses from 243,118 participants from nationally representative samples of 88 countries around the world. Analyses were conducted based on various divisions of this data into groups based on respondents' religious affiliation, level of religiosity, and country of residence. As preregistered, any groups with fewer than 100 respondents (according to the grouping criteria of that analyses) were excluded to ensure sufficiently large samples sizes for a reliable cultural distance estimate.

All data and code for the present analyses are available on the Open Science Framework (https://osf.io/4gv6d/).

Cultural Values. Following the criteria used by Muthukrishna et al. (7), the primary set of variables used to produce a measure of cultural distance included all values, preferences, beliefs, and self-reported behaviors available in the WVS that are plausibly culturally transmissible [e.g., excluding demographic characteristics, see Bell et al. (66) for a similar approach]. These variables fall along several dimensions, covering topics including political views, attitudes toward strangers and outgroup/ingroup members, religious and moral values, preferences in social relationships and child rearing, and attitudes toward economics, sexuality, and law. Following the procedure adopted by Muthukrishna et al. (7), responses to these questions were collapsed into particular response categories, analogous to alleles in population genetics. To avoid any potentially confounding effect of different response styles across countries, valenced responses to Likert-type scales were collapsed into positive versus negative response categories (e.g., "strongly agree" and "agree" were combined and "disagree" and "strongly disagree" were combined; the midpoint "neither" was treated as a third category). Questions with nominal responses were kept as separate response alleles. A full list of allele categorizations is available in *SI Appendix*.

We use the CF_{ST} metric developed by Muthukrishna et al. (7) (including the R-code and allele dimensions available in their supplementary materials) to measure distance between religious groups according to their responses to these cultural values. The Cultural F_{ST} statistic represents the ratio of between- and within-group variance of particular responses to each question in the WVS set of cultural values (analogous to how Genetic F_{ST} reflects the variance of particular alleles at a particular locus of a genome). This statistic quantifies the overall size of cultural differences between any two groups of individuals (i.e., cultural distance). Unlike other measures of cultural differences, this metric considers distributions, rather than point estimates of mean differences, across a range of discrete, potentially orthogonal cultural traits, rather than considering variation along a single dimension of culture that include continuous, binary, and nominal traits.

Values of CF_{ST} can range from 0 (populations are identical) to 1 (equal sized populations that are largely homogeneous but different). To determine whether cultural distances between groups were statistically significant, 95% CIs for all estimates were calculated by bootstrapping with 1,000 replications (following refs. 7, 66). Larger CF_{ST} values indicate greater differences between the patterns of cultural traits in each group and indicate the degree to which the populations can be considered structured and separate. F_{ST} is a nonlinear metric, meaning, for example, that an F_{ST} of 0.6 is larger but not twice as large as an F_{ST} of 0.3. Past research investigating cultural distances between countries (7) has documented CF_{ST} values that tend to range from 0 to about 0.3, with an average $CF_{ST} = 0.13$ between countries, indicating substantial overlap and greater similarity than differences between most country-level groups.

Our analyses take two approaches to minimize potential confounds between the religious denomination grouping and other cultural values. First, we removed the importance of religion or attendance at religious services from the set of cultural values for any analyses where importance/attendance was used as a grouping variable. Second, to test the robustness of the results, we conducted all analyses using three alternative coding approaches: 1) the full set of WVS dimensions; 2) all WVS dimensions except the items from the "beliefs" dimensions, which contain explicitly religious content (e.g., whether they believe in God and life after death), but retain attitudes toward moral norms that are not inherently measures of religious commitment but are often intertwined with religious issues (e.g., the justifiability of homosexuality, abortion, and euthanasia); and 3) only the WVS dimensions that do not refer to religious or moral beliefs [i.e., financial, group membership, law, political, sexuality, and social relationship dimensions identified by Muthukrishna et al. (7) through principle components analysis].

Grouping Variables.

Religious affiliation. Religious denomination was drawn from WVS variable No. F025. For most analyses, religious denominations were grouped into broader categories that collapsed across different subdenominations of larger categories of world religions, including subdenominations of Christianity (Roman Catholic, Orthodox, and Protestant/Evangelical/Pentecostal/Other Christian denominations), Islam (including Sunni, Shia, and a general "Muslim" option), Buddhism, Judaism, Spiritualism/Paganism (such as Brazilian Candomblé and Umbanda, Haitian Vodou, and other paganism and spiritualism), and Native or Folk religions.

This approach has the advantage of providing larger sample sizes than were available for most of the specific unique denominations available in the data and also aggregated across variability caused by different ways of asking the religious denomination question in each country. For example, the classification of Muslims as Sunni versus Shia (rather than a broad "Muslim" category) was only available in five countries, but where this distinction was available, Sunni versus Shia were very culturally close ($CF_{ST} = 0.026$ [0.025, 0.031]), and both Shia ($CF_{ST} = 0.035$ [0.0316, 0.0383]) and Sunni ($CF_{ST} = 0.026$ [0.0238, 0.0304]) were very culturally close to the overall nonspecific Muslim category. Therefore, we collapsed participants who selected Sunni, Shia, or Muslim into a single Muslim category for our analyses (see *SI Appendix* for a more-detailed discussion of these religious denomination classifications).

Religiosity. Two different measures were used as indicators of religious commitment, and analyses were conducted separately using each classification.

Importance of religion to one's life (WVS variable No. A006) Participants were split into 1) high importance: those who feel that religion is important ("very important" or "rather important") and 2) low importance: those who feel that religion is not important ("not very important" or "not at all important"). Secondary analyses were also conducted that compare those who state religion is "very important" versus "rather important" versus "not very important" and "not at all important" to allow us to look specifically at the most devout individuals. Results of these analyses were consistent with the division of participants into the broader high versus low religious importance categories, presented in the main text (full details are available in the *SI Appendix*).

Attendance at religious services (WVS variable No. F028) Participants were split into: 1) high attendance: those who attend religious services more than once a week or once a week, 2) mid attendance: those who attend religious services once a month, only on special holy days/Christmas/Easter days or other specific holy days, and 3) low attendance: those who attend religious services once a year, less often, or never/practically never.

Data Availability. All data have been deposited in Open Science Framework, https://osf.io/4gv6d/ (87).

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1. A. B. Cohen, Many forms of culture. *Am. Psychol.* **64**, 194–204 (2009).
2. J. Henrich, M. Muthukrishna, The origins and psychology of human cooperation. *Annu. Rev. Psychol.* **72**, 207–240 (2021).
3. A. Norenzayan, *Big Gods: How Religion Transformed Cooperation and Conflict* (Princeton University Press, 2013).
4. A. Norenzayan *et al.*, The cultural evolution of prosocial religions. *Behav. Brain Sci.* **39**, e1 (2016).
5. C. J. M. White, A. Norenzayan, "Belief in karma: How cultural evolution, cognition, and motivations shape belief in supernatural justice" in *Advances in Experimental Social Psychology*, J. M. Olson, Ed. (Academic Press, 2019), vol. 60, pp. 1–63.
6. J. Haidt, *The Righteous Mind: Why Good People Are Divided by Politics and Religion* (Vintage, 2013).
7. M. Muthukrishna *et al.*, Beyond Western, Educated, Industrial, Rich, and Democratic (WEIRD) psychology: Measuring and mapping scales of cultural and psychological distance. *Psychol. Sci.* **31**, 678–701 (2020).
8. R. Inglehart *et al.*, *World Values Survey: All Rounds – Country-Pooled Datafile* (JD Systems Institute & WVSA Secretariat, 2020).
9. J. Graham, J. Haidt, Beyond beliefs: Religions bind individuals into moral communities. *Pers. Soc. Psychol. Rev.* **14**, 140–150 (2010).
10. A. B. Cohen, M. S. Wu, J. Miller, Religion and culture: Individualism and collectivism in the East and West. *J. Cross Cult. Psychol.* **47**, 1236–1249 (2016).
11. A. Norenzayan, Theodiversity. *Annu. Rev. Psychol.* **67**, 465–488 (2016).
12. V. Saroglou, A. B. Cohen, "Cultural and cross-cultural psychology of religion" in *Handbook of the Psychology of Religion and Spirituality*, R. F. Paloutzian, C. L. Park, Eds. (Guilford Publications, ed. 2, 2013), pp. 330–354.
13. A. Korotayev, *World Religions and Social Evolution of the Old World Oikumene Civilizations: A Cross-Cultural Perspective* (Edwin Mellen Press, 2004).
14. J. Henrich, *The WEIRDest People in the World: How the West Became Psychologically Peculiar and Particularly Prosperous* (Farrar, Straus and Giroux, 2020).
15. Q. D. Atkinson, P. Bourrat, Beliefs about God, the afterlife and morality support the role of supernatural policing in human cooperation. *Evol. Hum. Behav.* **32**, 41–49 (2011).
16. A. F. Shariff, J. Piazza, S. R. Kramer, Morality and the religious mind: Why theists and nontheists differ. *Trends Cogn. Sci.* **18**, 439–441 (2014).

17. A. Adamczyk, B. E. Hayes, Religion and sexual behaviors: Understanding the influence of Islamic cultures and religious affiliation for explaining sex outside of marriage. *Am. Sociol. Rev.* **77**, 723–746 (2012).
18. J. Graham, J. Haidt, B. A. Nosek, Liberals and conservatives rely on different sets of moral foundations. *J. Pers. Soc. Psychol.* **96**, 1029–1046 (2009).
19. J. Graham *et al*., Mapping the moral domain. *J. Pers. Soc. Psychol.* **101**, 366–385 (2011).
20. J. Graham *et al*., "Chapter Two—Moral foundations theory: The pragmatic validity of moral pluralism" in *Advances in Experimental Social Psychology*, P. Devine, A. Plant, Eds. (Academic Press, 2013), vol. 47, pp. 55–130.
21. L. S. E. Hone, T. G. McCauley, E. J. Pedersen, E. C. Carter, M. E. McCullough, The sex premium in religiously motivated moral judgment. *J. Pers. Soc. Psychol.* **120**, 1621–1633, 10.1037/pspp0000296 (2021).
22. K. A. Johnson *et al*., Moral foundation priorities reflect U.S. Christians' individual differences in religiosity. *Pers. Individ. Dif.* **100**, 56–61 (2016).
23. S. R. Khan, M. N. Stagnaro, The influence of multiple group identities on moral foundations. *Ethics Behav.* **26**, 194–214 (2016).
24. M. E. McCullough, E. C. Carter, C. N. DeWall, C. M. Corrales, Religious cognition down-regulates sexually selected, characteristically male behaviors in men, but not in women. *Evol. Hum. Behav.* **33**, 562–568 (2012).
25. R. A. Shweder, N. C. Much, M. Mahapatra, L. Park, "The 'big three' of morality (autonomy, community, divinity) and the 'big three' explanations for suffering" in *Morality and Health*, A. M. Brandt, P. Rozin, Eds. (Routledge, 1997), pp. 119–169.
26. J. Weeden, A. B. Cohen, D. T. Kenrick, Religious attendance as reproductive support. *Evol. Hum. Behav.* **29**, 327–334 (2008).
27. J. Weeden, R. Kurzban, What predicts religiosity? A multinational analysis of reproductive and cooperative morals. *Evol. Hum. Behav.* **34**, 440–445 (2013).
28. C. Sabatier, B. Mayer, M. Friedlmeier, K. Lubiewska, G. Trommsdorff, Religiosity, family orientation, and life satisfaction of adolescents in four countries. *J. Cross Cult. Psychol.* **42**, 1375–1393 (2011).
29. J. Georgas, J. W. Berry, F. J. R. van de Vijver, Ç. Kagitçibasi, Y. H. Poortinga, *Families Across Cultures: A 30-Nation Psychological Study* (Cambridge University Press, 2006), 10.1017/CBO9780511489822.
30. J. F. Schulz, D. Bahrami-Rad, J. P. Beauchamp, J. Henrich, The church, intensive kinship, and global psychological variation. *Science* **366**, eaau5141 (2019).
31. R. Sosis, C. Alcorta, Signaling, solidarity, and the sacred: The evolution of religious behavior. *Evol. Anthropol.* **12**, 264–274 (2003).
32. D. Xygalatas *et al*., Extreme rituals promote prosociality. *Psychol. Sci.* **24**, 1602–1605 (2013).
33. M. Lang *et al*., Moralizing gods, impartiality and religious parochialism across 15 societies. *Proc. Biol. Sci.* **286**, 20190202 (2019).
34. B. G. Purzycki *et al*., Moralistic gods, supernatural punishment and the expansion of human sociality. *Nature* **530**, 327–330 (2016).
35. J. Watts *et al*., Broad supernatural punishment but not moralizing high gods precede the evolution of political complexity in Austronesia. *Proc. Biol. Sci.* **282**, 20142556 (2015).
36. K. Laurin, J. E. Plaks, Religion and punishment: Opposing influences of orthopraxy and orthodoxy on reactions to unintentional acts. *Soc. Psychol. Personal. Sci.* **5**, 835–843 (2014).
37. Y. J. Li *et al*., Fundamental(ist) attribution error: Protestants are dispositionally focused. *J. Pers. Soc. Psychol.* **102**, 281–290 (2012).
38. A. B. Cohen, P. Rozin, Religion and the morality of mentality. *J. Pers. Soc. Psychol.* **81**, 697–710 (2001).
39. T. B. Andersen, J. Bentzen, C.-J. Dalgaard, P. Sharp, Pre-reformation roots of the protestant ethic. *Econ. J. (Lond.)* **127**, 1756–1793 (2017).
40. A. Falk *et al*., Global evidence on economic preferences. *Q. J. Econ.* **133**, 1645–1692 (2018).
41. R. Grier, The effect of religion on economic development: A cross national study of 63 former colonies. *Kyklos* **50**, 47–62 (1997).
42. R. D. Hayward, M. Kemmelmeier, Weber revisited: A cross-national analysis of religiosity, religious culture, and economic attitudes. *J. Cross Cult. Psychol.* **42**, 1406–1420 (2011).
43. R. D. Woodberry, The missionary roots of liberal democracy. *Am. Polit. Sci. Rev.* **106**, 244–274 (2012).
44. R. D. Woodberry, T. S. Shah, Christianity and democracy: The pioneering protestants. *J. Democracy* **15**, 47–61 (2004).
45. S. O. Becker, L. Woessmann, Was Weber wrong? A human capital theory of protestant economic history. *Q. J. Econ.* **124**, 531–596 (2009).
46. R. M. McCleary, R. J. Barro, "Protestants and catholics and educational investment in Guatemala" in *Advances in the Economics of Religion*, J.-P. Carvalho, S. Iyer, J. Rubin, Eds. (Springer International Publishing, 2019). pp. 169–195. 10.1007/978-3-319-98848-1_11.
47. Y. Bai, J. K. Kung, Diffusing knowledge while spreading God's message: Protestantism and economic prosperity in China, 1840–1920. *J. Eur. Econ. Assoc.* **13**, 669–698 (2015).
48. N. Nunn, "Gender and missionary influence in colonial Africa" in *Africa's Development in Historical Perspective*, E. Akyeampong, R. H. Bates, N. Nunn, J. Robinson, Eds. (Cambridge University Press, 2014), pp. 489–512, 10.1017/CBO9781139644594.021.
49. F. Valencia Caicedo, The mission: Human capital transmission, economic persistence, and culture in South America. *Q. J. Econ.* **134**, 507–556 (2019).
50. E. L. Uhlmann, J. Sanchez-Burks, The implicit legacy of American protestantism. *J. Cross Cult. Psychol.* **45**, 992–1006 (2014).
51. M. Weber, *The Protestant Work Ethic and the Spirit of Capitalism* (Allen and Unwin, 1976).
52. J. Watts, O. Sheehan, J. Bulbulia, R. D. Gray, Q. D. Atkinson, Christianity spread faster in small, politically structured societies. *Nat. Hum. Behav.* **2**, 559–564 (2018).
53. P. Norris, R. Inglehart, *Sacred and Secular: Religion and Politics Worldwide* (Cambridge University Press, 2004).
54. S. Ruiter, F. van Tubergen, Religious attendance in cross-national perspective: A multilevel analysis of 60 countries. *Am. J. Sociol.* **115**, 863–895 (2009).
55. A. Norenzayan, W. M. Gervais, The origins of religious disbelief. *Trends Cogn. Sci.* **17**, 20–25 (2013).
56. Pew Research Center, *The Future of World Religions: Population Growth Projections, 2010–2050* (Pew Research Center, 2015).
57. Ethics and Public Policy Center, *The Desecularization of the World: Resurgent Religion and World Politics.* (W.B. Eerdmans Pub. Co, 1999).
58. R. Stark, R. Finke, *Acts of Faith: Explaining the Human Side of Religion* (University of California Press, 2000).
59. B. Herrmann, C. Thöni, S. Gächter, Antisocial punishment across societies. *Science* **319**, 1362–1367 (2008).
60. R. V. Levine, A. Norenzayan, The pace of life in 31 countries. *J. Cross Cult. Psychol.* **30**, 178–205 (1999).
61. M. J. Gelfand *et al*., Differences between tight and loose cultures: A 33-nation study. *Science* **332**, 1100–1104 (2011).
62. R. Thomson *et al*., Relational mobility predicts social behaviors in 39 countries and is tied to historical farming and threat. *Proc. Natl. Acad. Sci. U.S.A.* **115**, 7521–7526 (2018).
63. D. Acemoglu, J. A. Robinson, *Why Nations Fail: The Origins of Power, Prosperity, and Poverty* (Crown Publishers, 2012).
64. R. Inglehart *et al*., *Human Beliefs and Values, A Cross-Cultural Sourcebook Based on the 1999-2002 Values Surveys* (Siglo XXI, 2004).
65. R. Inglehart, W. E. Baker, Modernization, cultural change, and the persistence of traditional values. *Am. Sociol. Rev.* **65**, 19–51 (2000).
66. A. V. Bell, P. J. Richerson, R. McElreath, Culture rather than genes provides greater scope for the evolution of large-scale human prosociality. *Proc. Natl. Acad. Sci. U.S.A.* **106**, 17671–17674 (2009).
67. L. L. Cavalli-Sforza, P. Menozzi, A. Piazza, *The History and Geography of Human Genes* (Princeton University Press, 1994).
68. M. Minkov, G. Hofstede, Nations versus religions: Which has a stronger effect on societal values? *MIR Manag. Int. Rev.* **54**, 801–824 (2014).
69. J. P. van Oudenhoven, B. de Raad, C. Carmona, A.-K. Helbig, M. van der Linden, Are virtues shaped by national cultures or religions? *Swiss J. Psychol.* **71**, 29–34 (2012).
70. I. Brezina, J. P. van Oudenhoven, Do national cultures or religions shape conceptions of wisdom? *Stud. Psychol.* **54**, 299–311 (2012).
71. C. J. M. White, J. M. Kelly, A. F. Shariff, A. Norenzayan, Supernatural norm enforcement: Thinking about Karma and God reduces selfishness among believers. *J. Exp. Soc. Psychol.* **84**, 103797 (2019).
72. A. Mitra, D. Ray, "Hindu-Muslim violence in India: A postscript from the twenty-first century" in *Advances in the Economics of Religion*, J.-P. Carvalho, S. Iyer, J. Rubin, Eds. (Springer International Publishing, 2019). pp. 229–248. 10.1007/978-3-319-98848-1_14.
73. A. Varshney, *Ethnic Conflict and Civic Life: Hindus and Muslims in India* (Yale University Press, 2003).
74. Pew Research Center, "How religious restrictions have risen around the world." Pew Research Center's Religion & Public Life Project. https://www.pewforum.org/2019/07/15/a-closer-look-at-how-religious-restrictions-have-risen-around-the-world/ (2019). Accessed 1 February 2021.
75. J. Henrich, S. J. Heine, A. Norenzayan, The weirdest people in the world? *Behav. Brain Sci.* **33**, 61–83 (2010).
76. M. S. Rad, A. J. Martingano, J. Ginges, Toward a psychology of *Homo sapiens*: Making psychological science more representative of the human population. *Proc. Natl. Acad. Sci. U.S.A.* **115**, 11401–11405 (2018).
77. H. Meulemann, The two faces of American religious exceptionalism: Religiosity and dogmatism in the USA and Europe in 2007. *Soc. Compass* **60**, 251–272 (2013).
78. S. Atran, *Talking to the Enemy: Religion, Brotherhood, and the (Un)Making of Terrorists* (Ecco) 2011).
79. S. Bullivant, M. Farias, J. Lanman, L. Lee, Understanding Unbelief: Atheists and Agnostics Around the World: Interim Findings from 2019 Research in Brazil, China, Denmark, Japan, the United Kingdom, and the United States. https://www.stmarys.ac.uk/research/centres/benedict-xvi/understanding-unbelief.aspx (2019). Accessed 2 June 2020.
80. K. M. Loewenthal, "Religion, spirituality, and culture: Clarifying the direction of effects" in *Context, Theory, and Research*, K. I. Pargament, J. J. Exline, J. W. Jones, Eds., APA handbook of psychology, religion, and spirituality (American Psychological Association, 2013), vol. 1, pp. 239–255, 10.1037/14045-013.
81. K. A. Johnson, E. D. Hill, A. B. Cohen, Integrating the study of culture and religion: Toward a psychology of worldview. *Soc. Personal. Psychol. Compass* **5**, 137–152 (2011).
82. K. A. Johnson, Y. J. Li, A. B. Cohen, Fundamental social motives and the varieties of religious experience. *Religion Brain Behav.* **5**, 197–231 (2015).
83. M. Muthukrishna, J. Henrich, E. Slingerland, Psychology as a historical science. *Annu. Rev. Psychol.* **72**, 717–749 (2021).
84. E. Slingerland, B. Sullivan, Durkheim with data: The database of religious history. *J. Am. Acad. Relig.* **85**, 312–347 (2017).
85. R. D. Gray, J. Watts, Cultural macroevolution matters. *Proc. Natl. Acad. Sci. U.S.A.* **114**, 7846–7852 (2017).
86. C. Handley, S. Mathew, Human large-scale cooperation as a product of competition between cultural groups. *Nat. Commun.* **11**, 702 (2020).
87. C. J. M. White, M. Muthukrishna, A. Norenzayan, Religion and Cultural Distance. Open Science Framework. https://osf.io/4gv6d/. Deposited 24 May 2021.