Acts of God? Religiosity and Natural Disasters Across Subnational World Districts

Jeanet Sinding Bentzen*

Department of Economics, University of Copenhagen

September 6, 2018

Abstract

Religious beliefs influence individual behavior in many settings. But why are some societies more religious than others? One answer is religious coping: Individuals turn to religion to deal with unbearable and unpredictable life events. To investigate whether coping can explain global differences in religiosity, I combine a global dataset on individual-level religiosity with spatial data on natural disasters. Individuals become more religious if an earthquake recently hit close by. Even though the effect decreases after a while, data on children of immigrants reveal a persistent effect across generations. The results point to religious coping as the main mediating channel, but alternative explanations such as mutual insurance or migration cannot be ruled out entirely. The findings may help explain why religiosity has not vanished as some scholars once predicted.

*Jeanet.Bentzen@econ.ku.dk. I would like to thank Pelle Ahlerup, Philipp Ager, Thomas Barnebeck Andersen, Robert Barro, Roland Bénabou, Daniel Chen, Antonio Ciccone, Carl-Johan Dalgaard, Thomas Dohmen, Ernst Fehr, Oded Galor, Nicola Gennaioli, Casper Worm Hansen, Noel D. Johnson, Jo Thori Lind, Anastasia Litina, Benjamin Marx, Andrea Matranga, Stelios Michalopoulos, Omer Moav, Benjamin Olken, Ola Olsson, Luigi Pascali, Giacomo Ponzetto, Sarah Smith, Hans-Joachim Voth, Asger Mose Wingender, Fabrizio Zilibotti, Yanos Zyllerberg, seminar participants at University of Luxembourg, University of Bonn, New Economic School, Bristol University, University of Zurich, University of Gothenburg, Oslo University, University of Copenhagen, and participants at the conference on "The Future Directions on the Evolution of Rituals, Beliefs and Religious Minds", the ASREC conference, the AEA Annual Meeting, the NBER Summer Institute, the WEHC, GSE Summer Forum in Barcelona, the European Economic Association Annual Congress, and the Nordic Conference in Development Economics for comments. This paper is a major revision of Bentzen (2013), which benefited from financial support from the Carlsberg Foundation.

1 Introduction

More than four out of every five people on Earth profess a belief in God. There are large differences from country to country: Believers vary from 20% of the population in China to 100% in Algeria and Pakistan. There are also large differences *within* countries: 2% in Shanghai and 60% in the Fujian province.[1] These differences in religiosity matter for economic outcomes, such as labour force participation, education, crime, redistribution policies, health, and possibly even aggregate outcomes such as GDP per capita growth.[2] A first-order question is why some societies are more religious than others.

I test whether the need to cope psychologically with adverse shocks is an important determinant of differences in religiosity. This is known as the *religious coping hypothesis*. The hypothesis states that individuals draw on religious beliefs and practices to understand and deal with unbearable and unpredictable situations.[3] People seek a closer relationship with God or they find a reason for the event by attributing it to an act of God. Believers often answer that coping with adversity is one of the main purposes of religion, and scholars have emphasized that all major religions potentially provide coping.[4] Indeed, Karl Marx and Sigmund Freud maintained that *all* religions evolved to provide individuals with a higher power to turn to in times of hardship.[5]

I use natural disasters as a determinant of unpredictable adverse life events. I combine data on natural disasters with the pooled World Values Survey and European Values Study, available for 424,099 individuals in 96 countries. The surveys ask questions such as "How important is God in your life?" and "Are you a religious person?" The surveys also hold information on the location of the interview at the subnational district level. Each individual can therefore be matched with disasters at the district level. This allows inclusion of country fixed effects in the empirical analysis, which means that religiosity is compared only *within* countries, instead of across. I investigate mainly earthquakes, as earthquakes have proven very difficult to predict and since data on earthquakes are

[1] Source: The pooled World Values Survey and European Values Study 2004-2014.

[2] See Guiso *et al.* (2003), Scheve & Stasavage (2006), McCleary & Barro (2006), Gruber & Hungerman (2008), and Campante & Yanagizawa-Drott (2015) for empirical investigations or Iannaccone (1998), Lehrer (2004), Iyer (2016), and Kimball *et al.* (2009) for reviews.

[3] E.g., Pargament (2001), Cohen & Wills (1985), Park *et al.* (1990), Williams *et al.* (1991).

[4] Clark (1958) and Pargament (2001).

[5] Feuerbach (1957), Freud (1927), and Marx (1867).

particularly reliable.[6] Across 600-850 subnational districts of the world, individuals in districts with higher earthquake risk are more religious than those living in areas with lower earthquake risk. The binned scatterplot in Figure 1 shows the simple within-country relation between religiosity and the main measure of earthquake risk, distance to high-risk earthquake zones.

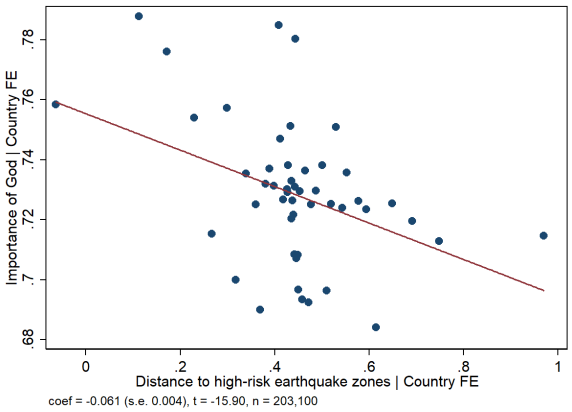


Figure 1. Binned scatterplot of the within-country relation between earthquake risk and religiosity in 50 bins

The main analysis uses six survey-based measures of religiosity that span global religiosity. The result is robust to adding controls for various individual characteristics as well as district-level geographic and economic confounders. Other unpredictable disasters such as volcanic eruptions and tsunamis also increase district-level religiosity. Individuals living on every continent and belonging to all major denominations, except Buddhism, respond to higher disaster risk by increased religiosity. A one standard deviation increase in earthquake risk increases religiosity by 8-11% of a standard deviation. This amounts to 80% of the well-established gender difference in religiosity.[7]

The result extends to measures of religiosity that are not based on surveys. People google "God", "Jesus", "the Bible", and "Pray" more often in US states with higher earthquake risk, compared to states with lower risk of earthquakes.

One concern is that unobserved factors are left out of the analysis, biasing the results. I exploit the time-dimension of the data to construct a panel where districts are followed over time. District-level religiosity increases after a recent earthquake. The effect is

[6] Fisker (2012). Other types of disasters such as wars, economic crises, and epidemic diseases are endogenous to various factors and thus unsuitable as natural experiments.

[7] Numerous studies have shown that women are more religious than men (see review by Trzebiatowska & Bruce (2012)).

due to increased personal beliefs and not increased churchgoing. The result is robust to adding country-by-year fixed effects, individual level controls, and reassuringly, future earthquakes do not affect current religiosity. Religiosity increases more in districts with lower average incomes, education, and population densities. Consistent with a literature on dynamic effects of various shocks on cultural values, the short-term spike in religiosity abates with time.[8]

To investigate whether a persistent residual impact remains, the last part of the analysis combines data on second generation immigrants with earthquake risk in their parents' country of origin. Individuals with parents from countries with high earthquake risk are more religious than those with parents from low earthquake risk areas. The result is robust to including country of residence fixed effects (picking up e.g., earthquake risk and average religiosity in the country of residence) and to adding controls at the level of the individual, parent, and country of origin. It seems that living in high-risk earthquake areas intensifies religiosity, which is passed on to future generations, like cultural values.

The analysis proceeds to investigate the mechanism through which earthquakes influence religiosity. Alternative explanations involving the direct economic loss after earthquakes, migration/selection, or a special culture evolving in high-risk areas, can explain some of the results. But only religious coping can explain *all* results across all analyses.

The findings relate to a literature that investigates the long-run emergence of potentially useful beliefs. This literature has linked gender roles to past agricultural practices (Alesina *et al.* (2013)), individualism to past trading strategies (Greif (1994)), trust to the slave trade in Africa and climatic risk (Nunn & Wantchekon (2011), Buggle & Durante (2017)), time-preference to variation in land productivity (Galor & Özak (2016)), and anti-Semitism to the Black Death (Voigtländer & Voth (2012)). The current study links a cultural value with evident implications for economic outcomes (religiosity) to one of its potential roots: Disaster risk.

The paper also relates to a literature that investigates cultural change caused by various shocks. Such shocks could be slave trade, climatic risk, and the Black Death from the above-mentioned studies. Another example is the Protestant Reformation (e.g., Becker & Woessmann (2009), Cantoni (2015), Andersen *et al.* (2017)), which influenced cultural values, such as hard work. The current study investigates earthquakes as such a

[8] E.g., Perrin & Smolek (2009) and Dinesen & Jæger (2013).

shock.

Last, the paper relates to a literature investigating the role of various socio-economic and psychological factors for differences in religiosity. For instance, studies have documented an increase in religiosity after other negative shocks, such as unemployment and divorce (Clark & Lelkes (2005)), declining social mobility (Binzel & Carvalho (2017)), rainfall variability (Ager & Ciccone (2018)), income shocks (Dehejia *et al.* (2007)), and the financial crisis (Chen (2010)).[9] The former two studies interpret religion as a psychological coping mechanism. The latter three studies interpret religion as a physical insurance mechanism, where people gain material aid by going to church. I attempt to disentangle these mechanisms empirically. For instance, the empirical setup makes it possible to remove districts that are directly damaged by earthquakes. The remaining effect can therefore not be attributed to physical insurance mechanisms or other explanations relating to direct development effects. One potential exception is if people choose to go to church in neighbouring districts to obtain material aid. This effect is also ruled out empirically in the event study, where churchgoing is not affected by earthquakes. I perform additional mechanism checks.

2 Religious coping

Religious coping means using religion psychologically to cope with unbearable and unpredictable situations.[10] Religious coping can involve seeking a closer relationship with God through prayer or other religious acts or finding a reason for the event by attributing it to an act of God. Religious coping is an example of emotion-focused coping, which aims at reducing or managing the emotional distress arising from the situation.

People say they use religion in coping. Nine out of ten Americans in a survey reported that they coped with their distress after the September 11 attack by turning to their religion (Schuster *et al.* (2001)). Many of the victims of the 1993 Mississippi River floods reported that religious stories, the fellowship of church members, and strength from God helped them endure and survive the flood (Smith *et al.* (2000)). Empirical evidence shows that individuals hit by various adverse life events, such as cancer, heart problems, death

[9] On the contrary, Buser (2015) documents a positive income shock that increased churchgoing in Ecuador.

[10] E.g., Pargament (2001), Cohen & Wills (1985), Park *et al.* (1990), Williams *et al.* (1991).

in close family, alcoholism, divorce, or injury are more religious than others.[11] Prayer is often a preferred coping strategy by hospitalized patients above seeking information, going to the doctor, or taking prescription drugs (Conway (1985)). However, being hit by adverse life events is most likely correlated with unobserved individual characteristics (such as lifestyle), which in turn may matter for one's inclination to be religious.

Norenzayan & Hansen (2006) solved the endogeneity issue in an experiment with 28 students from the University of Michigan. They primed half of the students with thoughts of death and the other half with neutral thoughts.[12] After the experiment, the students primed with thoughts of death were more likely to reveal religious beliefs. While solving the endogeneity issue, the study's external validity is challenged by the small sample. Much of the remaining literature also includes only Westerners. Yet, the theory is that religious coping is not something unique to Christianity. For instance, Pargament (2001) notes that (p3) "*While different religions envision different solutions to problems, every religion offers a way to come to terms with tragedy, suffering, and the most significant issues in life.*"

The belief that natural disasters carried a deeper message from God was the rule rather than the exception before the Enlightenment (e.g., Hall (1990), Van De Wetering (1982)). Later, the famous 1755 Lisbon earthquake has been compared to the Holocaust as a catastrophe that transformed European culture and philosophy.[13] Previous studies have shown a relation between earthquakes and religiosity. For instance, church membership increased by 50% in US states hit by massive earthquakes in 1811 and 1812, compared to 1% in other states (Penick (1981)). More people converted into religion in the Christchurch region after the 2011 earthquake, compared to the four other regions of New Zealand (Sibley & Bulbulia (2012)). Earthquakes retarded transition to self government across Medieval Italian cities, but only in cities where political and religious power rested in the

[11] See e.g., Ano & Vasconcelles (2005) and Pargament (2001) for reviews. The terminology "religious coping" is taken from the psychology literature, but other labels have been used. For instance, religious buffering, the religious comfort hypothesis, and psychological social insurance.

[12] The religious coping literature broadly agrees that religion is mainly used to cope with negative events rather than positive (e.g., Bjorck & Cohen (1993), Smith *et al.* (2000)).

[13] See review by Ray (2004). In addition to being one of the deadliest earthquakes ever, it struck on a church holiday and destroyed many churches in Lisbon, but spared the red light district. Accordingly, many thinkers associate the earthquake with the *decline* in religiosity across Europe afterwards. According to religious coping theory, shocks can instigate leaving God or embracing him. Empirics show that the latter is most common (e.g., Pargament (2001)).

hands of one person (Belloc *et al.* (2016)). The latter study argues that earthquakes were a shock to people's religiosity, which could be exploited by the religious leader for power purposes. Other studies have documented an effect of other disasters on churchgoing, e.g., the Great Mississippi river flood of 1927 (Ager *et al.* (2016)).

2.1 Identifying the coping mechanism

The remainder of this paper investigates whether natural disasters increase religiosity and whether the effect is due to religious coping or other explanations, such as mutual insurance or migration. I exploit three main features of the religious coping literature to disentangle the coping mechanism from other explanations. First, if the mechanism is psychological, people do not have to be hit directly by the earthquake in order to experience increased religiosity. They might use religion to cope with the distress caused by earthquakes that hit friends or family members in neighbouring districts. To investigate, I will exclude districts directly hit by earthquakes.

Second, the literature on religious coping agrees that people are more likely to use religion to cope with *unpredictable* events, compared to more predictable events.[14] People use so-called problem-focused coping to a larger extent to cope with predictable events, which means directly tackling the problem that is causing the stress (Lazarus & Folkman (1984)). Some existing evidence exploits differences in predictability of the event to shed light on the mechanism. Psalm recitation reduced anxiety among Israeli women during the 2006 Lebanon war, but only for those coping with the uncontrollable conditions of war. Psalm recitation was ineffective at combating more mundane controllable stressors (Sosis & Handwerker (2011)).[15] Practical everyday problems are less likely to trigger religious coping (Mattlin *et al.* (1990)). A testable implication is that unpredictable disasters increase religiosity, while predictable ones do not.

The third feature of the religious coping literature exploited to pin down the mechanism is that people tend to use their intrinsic religiosity to cope psychologically with adver-

[14] Norris & Inglehart (2011), Sosis (2008), and Park *et al.* (1990).

[15] Skinner (1948) found that this reaction to unpredictability might extend into the animal world. He found that pigeons subjected to an unpredictable feeding schedule were more likely to develop inexplicable behaviour, compared to the birds not subject to unpredictability. Since Skinner's pioneering work, various studies have documented how children and adults in analogous unpredictable experimental conditions quickly generate novel superstitious practices (e.g., Ono (1987)).

sity rather than their extrinsic religiosity.[16] Intrinsic religiosity involves private prayer and one's personal relation to God, while an example of extrinsic religiosity is going to church for food or shelter. The most frequently mentioned coping strategies among 100 older adults dealing with stressful events were faith in God, prayer, and gaining strength from God. Social church-related activities were less commonly noted (Koenig *et al.* (1988)). Miller *et al.* (2014) found that individuals for whom religion is more important had lower depression risk (measured by cortical thickness), while frequency of church attendance was not associated with thickness of the cortices.[17] A testable implication is that disasters increase intrinsic religiosity more than churchgoing.

3 Cross-district analysis

This section investigates whether individuals in areas with higher earthquake risk are more religious by estimating equations of the form:

$$religiosity_{idct} = \alpha + \beta earthquakerisk_{dc} + \gamma_{ct} + X'_{dct}\eta + Z'_{idct}\delta + \varepsilon_{idct}, \qquad (1)$$

where $religiosity_{idct}$ is the level of religiosity of individual i interviewed in subnational district d in country c at time t, $earthquakerisk_{dc}$ is earthquake risk in district d of country c.[18]

The *baseline controls* include country-by-year-of-interview fixed effects (γ_{ct}), a vector of individual level controls (Z_{idct}) for age, age squared, sex, and marital status, and district-level controls (X_{dct}) for distance to the coast, absolute latitude, and dummies for actual earthquakes in year t and year t-1.[19] Distance to the coast accounts for the fact that earthquake risk is higher along the coast, as tectonic plates often meet in the ocean. Absolute latitude is meant as a catch-all for geographic confounders at the district level.

[16] E.g., Johnson & Spilka (1991) and the review by Pargament (2001).

[17] Further, Koenig *et al.* (1998) found that time to remission was reduced among 111 hospitalized individuals engaging in intrinsic religiosity, but not for those engaging in church going.

[18] The country weights provided by the pooled WVS-EVS are used throughout (variable s017). The estimates are similar without weights. Weights that make the sample representative at the subnational level are not provided by the WVS-EVS. To the extent that the sampling is based on observables, the potential district-level sampling bias falls as controls are included. Online Appendix B.9.1 shows the results aggregated to the country-level using country weights. The results are maintained, except for average churchgoing and beliefs in an Afterlife, which are not affected significantly by earthquake risk. The results are exactly the same when aggregating the data without country weights.

[19] These are earthquakes of magnitude 6 or above hitting within 100 km of the district border. The data on earthquake events are described in Section 4.1.

Controlling for actual recent earthquakes ensures that the long-term results are not caused by or blurred by short-term effects. Additional controls are included for robustness. One concern is that additional unobserved factors at the district level drive the results. These unobserved confounders are accounted for in Section 4.

The estimated standard errors in parenthesis are clustered at the subnational district level to account for potential spatial dependence. A more conservative way to account for spatial dependence at the district (country) level is to aggregate religiosity to the district (country) level, which is done in Online Appendix B.9. Religiosity remains significantly higher in districts (countries) with higher earthquake risk.

3.1 Data on religiosity

The dataset on religiosity used in the main analysis of Sections 3.4 and 4 is the pooled World Values Survey (WVS) and European Values Study (EVS) carried out in 5 waves over the period 1981-2009.[20] This dataset includes information on 424,099 persons interviewed in 96 countries.

Among the questions asked are various questions on religious beliefs. I use six questions, which have been shown by Inglehart & Norris (2003) to span the global variation in religiosity. Table 1 shows the particular questions.[21]

These measures of religiosity may not be comparable across countries, which is the reason for including country fixed effects throughout. The event study in Section 4 also accounts for district fixed effects, meaning that religiosity is only compared over time within the same district. Information on the subnational district is available for half of the respondents, reducing the sample to 212,157 individuals in 914 districts in 85 countries.[22]

[20] Available online at http://www.worldvaluessurvey.org and http://www.europeanvaluesstudy.eu. Since the first revision of this paper, an additional wave came out (2010-2014) for some of the religiosity measures. However, the subnational district names in the pooled WVS-EVS 1981-2009 do not match the names in the new wave. Online Appendix B.9 shows country-aggregates including the recent wave. Not all six main religiosity measures are available in the new wave, so the results using the composite measure will be unaltered.

[21] An earlier version of this paper includes additional measures of religiosity, arriving at the same conclusions. Online Appendix B.11 shows results using different categorizations of the variables. I rescaled all measures to lie between 0 and 1.

[22] The number of districts in a country ranges from 2 to 41. The mean (median) number of districts is 15.9 (14). The average (median) district has 766 (466) respondents, or 335 (235) respondents per year. Throughout, only districts with more than 10 respondents in each year are included in the estimations. Including the full set of districts does not alter the results, neither does restricting the required number of respondents further, or weighting the results with the number of respondents (Online Appendix B.4).

This covers most of the inhabited parts of the world and is depicted in Figure 2.

Table 1. Summary statistics of the main religiosity measures

		Data with district information			Full WVS-EVS dataset		
Survey questions	Answers	N	Mean	Std.dev.	N	Mean	Std.dev.
How important is God in your life?	0="not at all important", 0.1,..., 1="very important"	203,514	.73	0.34	393,690	.68	0.36
Are you a religious person?	0="no", 1="yes"	197,137	.71	0.45	382,618	.70	0.46
How often do you attend religious services?	0="Never, practically never", 0.15,..,1="More than once a week"	201,674	.49	0.36	396,211	.47	0.35
Do you find comfort in God?	0="no", 1="yes"	130,384	.74	0.44	284,631	.68	0.47
Do you believe in God?	0="no", 1="yes"	134,201	.87	0.34	290,650	.84	0.37
Do you believe in life after death?	0="no", 1="yes"	123,968	.65	0.48	268,859	.60	0.49

Notes. The unit is an individual. The first columns show summary statistics for the dataset that has information on the subnational district. The last columns show averages for the entire pooled WVS-EVS 1981-2009 dataset. Source: Pooled WVS-EVS 1981-2009.

The last three columns in Table 1 show the summary statistics for the full WVS-EVS dataset. Average religiosity is similar in the two samples. For instance, 84-87% of the respondents believe in God and 60-65% believe in life after death.

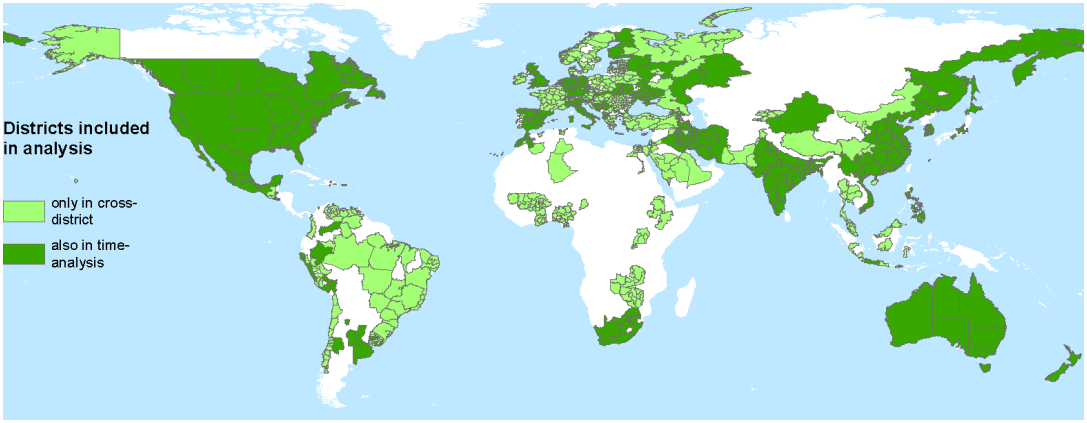


Figure 2. Subnational districts included in the analysis

Notes. Dark green districts are measured more than once in the WVS-EVS, while light green indicates that the district is measured once. Source: Own mapping of the pooled WVS/EVS 1981-2009 with ESRI administrative districts.

Importance of God and churchgoing measure the *degree* of believing or churchgoing (the intensive margin). The remaining measures are dummy variables indicating conver-

sion rates (the extensive margin). That is, *whether or not* these individuals rate themselves as religious or not. Arguably, conversion rates are harder to influence than the degree of believing, which serves as a consistency check of the findings.

I estimate equation (1) for all six religiosity measures and two composite measures: The *Strength of Religiosity Scale (SRS)* is the first principal component of all six measures (suggested by Inglehart & Norris (2003)) and the *Strength of Intrinsic Religiosity Scale (SIRS)* is the first principal component of all measures except churchgoing. Since the latter measure excludes churchgoing, it is the most direct test of the religious coping effect. The correlation between the two aggregated measures is 0.987.

3.2 Data on earthquake risk

The measure of earthquake risk is based on data on earthquake zones, provided by the United Nations Environmental Programme as part of the Global Resource Information Database (UNEP/GRID).[23] The data are depicted in Figure 3. Earthquake risk is divided into five categories based on various parameters such as ground acceleration, duration of earthquakes, subsoil effects, and historical earthquake reports. The intensity is measured on the Modified Mercalli (MM) Scale. The zones indicate the probability that a particular grid cell will be hit by an earthquake of a certain size within the next 50 years. Zone zero indicates earthquakes of size moderate or less (V or below on the MM Scale), zone one indicates strong earthquakes (VI on the MM Scale), two indicates very strong (VII), three indicates severe (VIII), and zone four indicates violent or extreme earthquakes (IX or X).

I match the individual-level data on religiosity to the earthquake risk data at the level of first administrative units (described in Online Appendix A). The main measure of earthquake risk is the geodesic distance from the border of district d in country c to the closest high-intensity earthquake zone, $dist(earthquake\ zones)_{dc}$. The choice of "high-intensity" zones is a balance between zones that are represented in as many parts of the world as possible and that involve enough risk to potentially matter for peoples' lives.

[23] Available online at http://geodata.grid.unep.ch/. The results hold using instead country-level data on deaths and affected people after earthquakes, while economic damage after earthquakes does not increase believing (Online Appendix B.10). These results should be interpreted with caution, as actual losses from natural disasters are potentially highly endogenous to economic development, which in itself might correlate with religiosity.

In the main analysis, $dist(earthquake\ zones)_{dc}$ is the distance from district borders to risk zones 3 or 4 (dark red and dark orange on the map). The mean (median) distance to earthquake zones 3 or 4 is 441 (260) km. The results are robust to choosing different high-intensity zones, to taking the logarithm of the distance, and to measuring instead the distance to default lines (Online Appendix B.2).

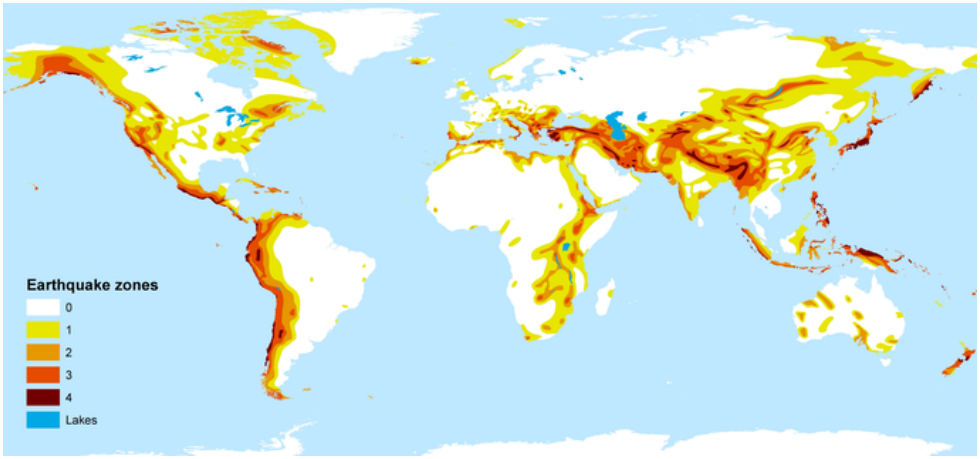


Figure 3. Earthquake zones

Notes. Darker colour indicates higher earthquake risk. Zones described in the text. Source: UNEP/GRID

Another measure of earthquake risk is the average value of earthquake zones in a district, $mean(earthquake\ zones)$. The correlation with $dist(earthquake\ zones)$ is -0.65. Results hold using $mean(earthquake\ zones)$, but are less robust to adding controls (Online Appendix B.2). The distance-based measure is preferred, since the psychological effects can be disentangled from the economic effects of earthquakes when using this measure.

3.3 Disentangling psychological from economic effects

The mean-based measure of earthquake risk equals zero for all districts in zone zero, and the main variation comes from within the riskier zones 1-4. The distance-based measure equals zero for districts in zones 3 and 4, and the main variation stems from outside the most risky zones 3 and 4. This is crucial when disentangling the mechanisms, where a key challenge is to remove physical damage of earthquakes in order to isolate the psychological mechanism. $mean(earthquake\ zones)$ correlates significantly with actual deaths, affected people, and damage caused by earthquakes, while $dist(earthquake\ zones)$

does not (Online Appendix B.10). The distance-based measure, therefore, excludes a large share of the physical effects of earthquakes. A crucial check of the mechanism will be to exclude all the districts within zones 3 and 4, where the losses are large.

To substantiate that people can be affected by earthquakes that do not physically hit them or their district, take a specific earthquake that hit California in 2014. On August 24^{th}, an earthquake sized 6.0 on the Richter scale hit Napa Valley with reconstruction costs of around 1 billion dollars, 1 dead, and 200 injured. Google searches on the event increased in the Napa Valley, but also in surrounding metropolitan areas and even in surrounding states (Online Appendix B.3). People in surrounding areas may have friends or family members in the affected areas. People living further away were less likely to google the event. The mean-based measure of earthquake risk does not capture this variation, as the measure equals zero in all districts in earthquake zone 0.

3.4 Cross-district results

Panel A of Table 2 shows results for the six measures of religiosity and the two composite measures. The baseline set of controls are included throughout.[24] The measure of earthquake risk is distance to nearest high-risk earthquake zone, $dist(earthquake\ zones)$. People in areas with high earthquake risk are more religious according to all religiosity measures.[25]

The results are not driven by specific observations. Figure 4 shows the binned scatterplot of column (1) in Panel A, where individuals are grouped into 50 equally sized bins.[26]

Individuals living in districts located 1,000 km closer to a high-risk earthquake zone are 6 pct points more religious (based on column (8) of Panel A). This difference in religiosity amounts to the difference between Canada (median religiosity) and Chile (66^{th} percentile). The mean level of religiosity in the sample is 77.5% (based on the SIRS measure) and the mean distance to high-risk earthquake zones is 360 km. In standardized terms, a one standard deviation increase in earthquake risk increases intrinsic religiosity by 8-11% of

[24] The results are very similar without controls. See Figure 1 and Online Appendix B.8.1.

[25] The conclusions are unchanged using probit or ordered probit estimation and for six additional measures of religiosity (see a previous version of the paper).

[26] Three bins seem to be outliers. The estimate on earthquake risk increases in absolute size to -0.061 with a p-value of 0.007 when excluding bins 1, 4, and 50. Plots of the remaining religiosity measures are shown in Online Appendix B.6.

a standard deviation. This amounts to 80% of the well-established gender difference in religiosity. (Online Appendix B.5).[27]

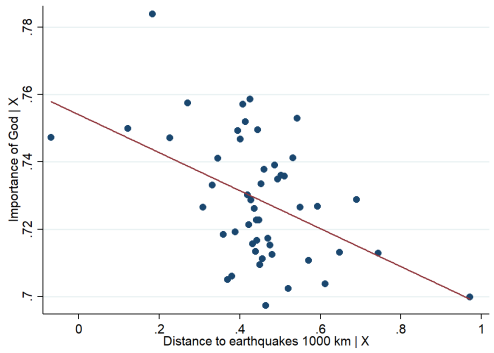


Figure 4. Binned scatterplot of the main result including baseline controls

Notes. The plot shows the regression in column (1) of Panel A of Table 2, binned into 50 bins.

One concern is that the estimated impact is driven by an effect on development: Earthquakes may affect local development, which may in turn influence religiosity. The literature is inconclusive about the effect of earthquakes on development and also on the effect of development on religiosity.[28] Furthermore, the main variation in the earthquake risk measure comes from outside the high-risk zones. Therefore, it seems unlikely that development effects are driving the result. Nevertheless, I account for development in three distinct ways. First, districts in high-risk zones are arguably more likely to experience lower development due to earthquakes. I remove districts located within high-risk zones 3 and 4 from the sample in Panel B. The estimates fall slightly, but are statistically unchanged. The results therefore do not seem to be driven by the districts that suffer most direct damage, which is consistent with a psychological explanation.

[27] Numerous studies have shown that women are more religious than men (see review by Trzebiatowska & Bruce (2012)).

[28] See e.g., Ahlerup (2013) for a positive effect of earthquakes on development, Cavallo *et al.* (2013) for a negative impact. The secularization hypothesis does not find much support in the data (e.g.,Inglehart & Baker (2000), Norris & Inglehart (2011), Stark & Finke (2000), and Iannaccone (1998)).

Table 2. OLS estimates of Religiosity on Earthquake risk

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	impgod	relpers	service	comfort	believe	afterlife	SRS	SIRS
Panel A. Baseline results								
Dist(earthquake zones), 1000km	-0.052***	-0.044**	-0.035**	-0.059***	-0.035**	-0.115***	-0.062***	-0.063***
	(0.014)	(0.019)	(0.015)	(0.020)	(0.018)	(0.026)	(0.016)	(0.016)
	[0.015]	[0.022]	[0.018]	[0.026]	[0.021]	[0.028]	[0.016]	[0.017]
	[0.011]	[0.016]	[0.012]	[0.017]	[0.015]	[0.020]	[0.013]	[0.013]
Observations	198,264	192,120	196,860	126,195	129,910	120,072	103,282	104,040
R-squared	0.407	0.208	0.278	0.263	0.226	0.202	0.337	0.325
Districts	884	880	868	611	592	592	591	591
Countries	85	84	83	67	66	66	66	66
Panel B. Excluding districts located in earthquake risk zones 3 and 4								
Dist(earthquake zones), 1000km	-0.039***	-0.041**	-0.029*	-0.058***	-0.037*	-0.106***	-0.055***	-0.058***
	(0.014)	(0.021)	(0.016)	(0.022)	(0.020)	(0.026)	(0.017)	(0.018)
Observations	167,430	162,276	165,571	103,071	106,076	97,917	84,418	84,975
R-squared	0.408	0.199	0.291	0.268	0.232	0.195	0.340	0.327
Districts	748	744	732	506	488	488	487	487
Panel C. Adding controls for district level development and dummies for individual education								
Dist(earthquake zones), 1000km	-0.053***	-0.049**	-0.036**	-0.055***	-0.038**	-0.118***	-0.064***	-0.065***
	(0.014)	(0.020)	(0.015)	(0.020)	(0.018)	(0.026)	(0.016)	(0.017)
Observations	187,770	180,656	185,141	117,021	121,469	112,453	97,033	97,523
R-squared	0.400	0.195	0.276	0.252	0.233	0.211	0.339	0.329
Districts	869	866	854	586	578	578	577	577
Panel D. Adding squared earthquake risk								
Dist(earthquake zones), 1000km	-0.091***	-0.087***	-0.064**	-0.087***	-0.058**	-0.166***	-0.083***	-0.088***
	(0.023)	(0.032)	(0.025)	(0.034)	(0.027)	(0.040)	(0.025)	(0.027)
Dist(earthquake zones) squared	0.023***	0.025**	0.017**	0.023	0.019	0.041**	0.017	0.020
	(0.007)	(0.010)	(0.008)	(0.020)	(0.014)	(0.017)	(0.013)	(0.014)
Observations	198,264	192,120	196,860	126,195	129,910	120,072	103,282	104,040
R-squared	0.407	0.208	0.279	0.263	0.226	0.202	0.337	0.325
Impact at 500 km	-0.0793	-0.0746	-0.0557	-0.0759	-0.0491	-0.145	-0.0743	-0.0775
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y

Notes. The unit of analysis is an individual. The dependent variables are the six measures of religiosity listed in Table 1 and their composite measures. Dist(earthq zones) measures the distance in 1000 km to the nearest earthquake zone 3 or 4. Baseline controls are described under equation (1). All columns include a constant. Standard errors are clustered at the subnational district level in parenthesis, at the country level in the first set of squared brackets, and corrected using Conley's (1999) correction in the second set of squared brackets (cutoff = 500 km). Asterisks ***, **, and * indicate significance at the 1, 5, and 10% level, respectively, based on the standard errors clustered at the district level.

RESULTS: Districts closer to high-risk earthquake zones are more religious, even controlling for actual recent earthquakes and development. And also when excluding districts within the high-risk earthquake zones.

Second, Panel C adds dummies for eight education categories and average lights visible by night per square km, widely used in recent research as a proxy for local development.[29] The impact of earthquake risk on religiosity remains unchanged. These results should be interpreted with caution, as education and development are potentially endogenous to religiosity. Third, the result persists after including alternative measures of development, such as individual-level income deciles, unemployment status, a dummy for whether the respondent works in agriculture, and population density. Adding more exogenous development proxies - share of arable land and soil quality - also does not alter the results (Online Appendix B.8).

Panel D checks the linearity of the estimate of earthquake risk on religiosity. Even if the religious coping hypothesis was true, one would not expect that individuals living 2,000 km from a high-risk earthquake zone are more religious than those living 2,100 km away because of the increased distance. Both of these groups live far from earthquake zones, and 100 km should not matter. Panel D confirms the diminishing impact of distance across most religiosity measures.[30]

3.5 Other natural disasters

Table 3 shows the impact of the risk of four geophysical and metereological disasters on religiosity: Earthquakes, tsunamis, volcanic eruptions, and tropical storms.[31] The measure of religiosity is the composite measure, SIRS. People are more religious in areas with high risk of earthquakes or tsunamis, but even more so if the risk of both disasters is high (columns 1-4). Increased risk of volcanic eruptions also increases religiosity, but only in districts within 1000 km of a volcanic eruption zone, most likely due to the spatial concentration of volcanic eruptions (column 5). The risk of storms does not affect religiosity (columns 7 and 8). These findings are consistent with the religious coping literature, where mainly *unpredictable* disasters instigate a need for religion in coping. Meteorol-

[29] Education categories run from 1, which indicates "Inadequately completed elementary education" to 8, which indicates "University with degree / Higher education". Lights are based on NASA's pixel level lights data. The wealthier the district and the more educated the individual is, the lower the level of religiosity (estimates not shown).

[30] The same conclusion is reached if one excludes districts in increments of 500 km from earthquake zones (see a previous version of this paper).

[31] These are the worst types of geophysical and meteorological disasters across the globe based on the map of natural disasters from Munich Re (www.munichre.com). The correlations with distance to earthquake zones are: 0.457 (volcanic eruptions), 0.381 (tsunamis), and 0.196 (storms), respectively. All disaster data are described in Online Appendix B.13.

ogists have a much easier time predicting storms than seismologists have in predicting earthquakes.[32]

Table 3. Main results with alternative disaster measures

Dep var.: SIRS	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster:	Earthq	Tsunami	Earthq and tsunamis	Earthq and tsunamis	Volcano	Volcano	Storm	Storm
Distance measure:	dist	dist	avg dist	min dist	dist	dist	dist	
Distance(disasters), 1000 km	-0.063***	-0.067***	-0.094***	-0.089***	-0.008	-0.026**	-0.014	0.012
	(0.016)	(0.017)	(0.021)	(0.019)	(0.007)	(0.013)	(0.014)	(0.029)
Observations	104,040	104,040	104,040	104,040	104,040	59,132	104,040	38,643
R-squared	0.325	0.326	0.326	0.326	0.325	0.333	0.325	0.328
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y
Sample	Full	Full	Full	Full	Full	<1000 km	Full	<1000 km
Districts	591	591	591	591	591	321	591	129

Notes. OLS estimates. The dependent variable is the Strength of Intrinsic Religiosity Scale. The disaster measure is distance to earthquake zones 3 or 4 in column (1), tsunamis in column (2), the average distance to earthquake zones and tsunamis in column (3), the minimum distance to earthquake zones or tsunamis in column (4), distance to volcanic eruption zones in columns (5) and (6), and distance to tropical storm zones in columns (7) and (8). The sample is restricted to districts within 1000 km of high risk disaster zones in columns (6) and (8). All disaster data are described in Appendix B.9. All columns include a constant. Standard errors (in parenthesis) are clustered at the level of subnational districts. Asterisks ***, **, and * indicate significance at the 1, 5, and 10% level, respectively.

RESULTS: Higher risk of earthquakes, tsunamis, and volcanic eruptions increase religiosity. Storm risk does not.

3.6 Heterogeneity

Higher earthquake risk increases religiosity on all continents, and for Christians, Muslims, Jews, and Hindus (Online Appendix B.12). Buddhist beliefs are not significantly affected by earthquake risk in this sample and with the particular religiosity measures.[33] Followers of monotheistic religions or religions with big gods are also no differently affected than the rest.[34] That followers from rather diverse religions all engage in religious coping is consistent with the literature on religious coping (e.g., Abu-Raiya & Pargament (2015)).

[32]The US Geological Survey (USGS) notes that earthquakes cannot be predicted (www2.usgs.gov/faq/categories/9830/3278). See also this post about our ability to forecast storms and their paths, as opposed to our inability to forecast earthquakes: www.tripwire.com/state-of-security/risk-based-security-for-executives/risk-management/hurricanes-earthquakes-prediction-vs-forecasting-in-information-security/

[33]The results for Jews and Buddhists should be interpreted with caution, as there are only 426 and 1,007 respondents of each in the sample.

[34]The concept "Big Gods" (defined by Norenzayan & Shariff (2008)) refers to the omniscient and omnipotent higher powers that are prevalent across many major religious traditions today.

There is also no differential impact of earthquake risk across income - or education groups (Online Appendix B.15). However, earthquake risk increases religiosity significantly more for unemployed individuals, even controlling for income. Employment perhaps provides something in addition to income, such as social networks, that reduce the need for religion in coping (e.g., Scheve & Stasavage (2006)).

3.7 Further robustness checks

This section summarizes additional robustness checks, detailed in Online Appendix B.

One concern is that earthquakes influence other cultural values, which are driving the results. The results are robust to adding controls for alternative cultural values such as trust, manners, independence, hard work, feeling of responsibility, imagination, tolerance and respect for other people, thrift, determination and perseverance, unselfishness, and obedience. Another concern is that earthquake risk correlates with other geographic features that drive the correlation. The results are robust to adding average temperature, average and variance of precipitation, ruggedness, elevation, district area, and a dummy equal to one if the district is located within high risk zones. The results are also robust to adding 116 ethnicity fixed effects.

The size of the effect of earthquake risk is statistically similar across all measures of religiosity. The effect on religiosity is driven mainly by the intensive margin (the degree of believing), and not by the extensive margin (whether or not people believe). This is consistent with the idea that conversion into religion is harder to influence than religiosity among existing believers.

A measure of religiosity that might relate more directly to religious coping is prayer outside religious services.[35] Earthquake risk increases prayer outside religious services, which is consistent with religious coping and cannot be explained by theories that involve churchgoing.

3.8 Google searches on religion

The results hold using alternative measures of religiosity based on Google searches.[36] People in US states with higher earthquake risk google "God", "Jesus", "Pray", and "Bible" more as a share of their total Google searches (Figure 5 and Online Appendix

[35] Thank you to an anonymous referee for suggesting this measure.

[36] Thanks to an anonymous referee for suggesting this.

B.16).[37] They are not more likely to search for churches. This is consistent with the idea that mainly intrinsic religiosity is used in coping and inconsistent with explanations involving churchgoing. The results are robust to including four region fixed effects and controls for distance to the ocean, absolute latitude, and GSP per capita.

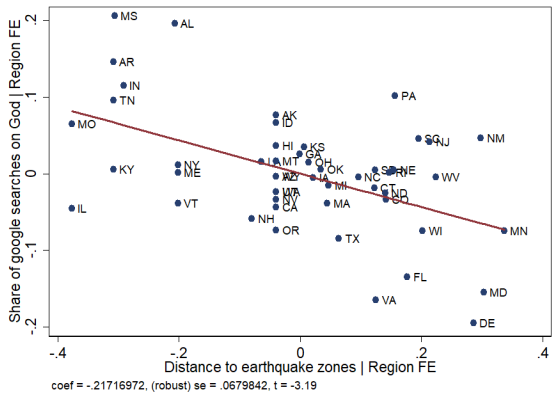


Figure 5. Earthquake risk and Google searches on God across US states

4 Event study

This section exploits the time-dimension of the WVS-EVS data to account for district-level time-invariant unobservables. The same individuals are not followed over time, but a third of the districts are measured more than once, which makes it possible to construct a synthetic panel, where the panel dimension is the subnational district and the time dimension is the year of interview.[38] I match this information with earthquake events at the district level. The main analysis relies on the following equation:

$$\Delta relig_{dcw} = \alpha + \beta \Delta earthquake_{dcw} + \lambda_{cw} + \Delta X'_{dcw}\delta + \Delta \varepsilon_{dcw}, \qquad (2)$$

where $\Delta relig_{dcw} = relig_{dcw} - relig_{dcw-1}$ measures the change in district-level religiosity between interview waves $w-1$ and w in district d in country c. Since religiosity is

[37] I choose the US based on three criteria: It is one of the countries in the world with the largest internet penetration, it is geographically large, and it has variation in earthquake risk. The particular search terms are chosen based on a New York Times article about using Google trends to measure trends in religiosity (https://www.nytimes.com/2015/09/20/opinion/sunday/seth-stephens-davidowitz-googling-for-god.html).

[38] Restricting the sample in Table 2 to the sample of districts that were surveyed more than once does not alter the estimates on earthquake risk.

not measured annually, $w-1$ can indicate a lag of several years.[39] $\Delta earthquake_{dcw} = earthquake_{dcw} - earthquake_{dcw-1}$ measures either the number of earthquakes that hit between waves or a dummy equal to one if one or more earthquakes hit in between the waves. *Baseline controls* include country-by-year fixed effects (λ_{cw}), individual-level controls for sex, marital status, age, and age squared, time-varying district-level controls for the number of years between interviews and the number of years since an earthquake hit ($\Delta X'_{dcw}$). Additional controls are added as robustness.[40]

Equation (3) allows the impact of earthquakes to vary depending on how often the district is otherwise hit:

$$\Delta relig_{dcw} = \alpha + \beta \Delta earthq_{dcw} + \gamma \Delta earthq_{dcw} \cdot frequent_{dc} + \lambda_{cw} + \Delta X'_{dcw}\delta + \Delta \varepsilon_{dcw}, \quad (3)$$

where $frequent_{dc}$ is a dummy equal to one if the district is frequently hit by earthquakes.

4.1 Data on earthquake events

The Advanced National Seismic System at the US Geological Survey provides data on the timing, location, and severity of earthquakes since 1898 (Online Appendix C.1). The analysis exploits the 68,711 earthquakes that hit the surface of the Earth between 1973 and 2014 of magnitude 5 or above.[41] Figure 6 shows earthquakes split into those of magnitude 5-5,999 (dark blue dot) and those of magnitude 6 or above (larger red dot).

I combine the earthquakes with the shapefile of subnational districts used in Section 3.4. I define a district as being hit by an earthquake if the earthquake hit within X km of the district border. I choose X low enough to ensure that the earthquake was likely to influence the people in the particular district, but high enough to ensure that potentially

[39] $relig_{dcw}$ is based on information at the individual level aggregated up to the district level, using appropriate weights (variable s017), s_{idcw}: $relig_{dcw} = \frac{1}{N}\sum_{i=1}^{N} s_{idcw} \cdot \widehat{relig}_{idcw}$, where $\widehat{relig}_{idcw}$ measures the residuals of a regression of $relig_{idcw}$ on the included individual-level controls.

[40] Standard errors are clustered at the country-level throughout. Conclusions are the same if using instead unclustered standard errors.

[41] Due to improvements in earthquake-detection technology, earthquakes of magnitudes below 5 on the Richter Scale cannot be compared over time, and neither can earthquakes of any size before 1973. The number of earthquakes of all magnitudes in the data increases up until 1973 and the number of earthquakes of magnitudes below 5 increases over the entire period. Since the number of earthquakes has not increased in reality, the implication is that earthquake detection technology must have improved over time. There has been no trend in the number of earthquakes of magnitude 5 or above since 1973.

influential earthquakes are not lost. For the main analysis, a district is defined as having been hit when an earthquake hit within 100 km of the district border. The results are robust to alternative cut-offs (Online Appendix C.2).

As expected, larger earthquakes increase religiosity more (Online Appendix C.10). For the main analysis, I use earthquakes of magnitude 6 or above (the red dots in Figure 6).[42]

The dummy, $frequent_{dc}$, equals one for districts frequently hit by earthquakes, zero otherwise. I define frequently hit as being hit by a total of 7 or more earthquakes over the period 1973-2014, where 7 is the 95^{th} percentile in the distribution of earthquakes. There are 13 such districts in the sample. The results are robust to similar definitions of being frequently hit (Online Appendix C.6).

I drop 38 observations where an earthquake hit in the same year as the WVS-EVS interview, as it is not possible to identify whether the earthquake hit before or after the interview for these observations.[43] Dropping the 38 observations also means dropping the districts that are most often hit by earthquakes, including districts where earthquakes hit within district borders. The main results therefore exclude districts that are directly hit by earthquakes, i.e. where the earthquake hit within zero km of the district borders. This helps in disentangling the psychological effect from potential economic effects.

[42] Earthquake zones 3-4 (used in Section 3.4) correspond to earthquakes with magnitudes above 6.0 on the Richter scale. As the cross-district analysis uses the distance to these zones, it implicitly also includes the smaller earthquakes. The earthquakes in the event study are measured in terms of magnitude, which includes the Richter Scale, but also other comparable scales.

[43] The WVS-EVS provides information on the year of interview for all respondents. Information on the month of the interview is available for a third of the sample. Hence, if distance to the nearest earthquake in each month was calculated, a maximum of 12 observations could be gained (a third times the 38 observations), provided that none of the earthquakes hit in the same month as the interview. However, there may be a selection bias when comparing these districts with those with only yearly information. The results are robust to including the particular observations.

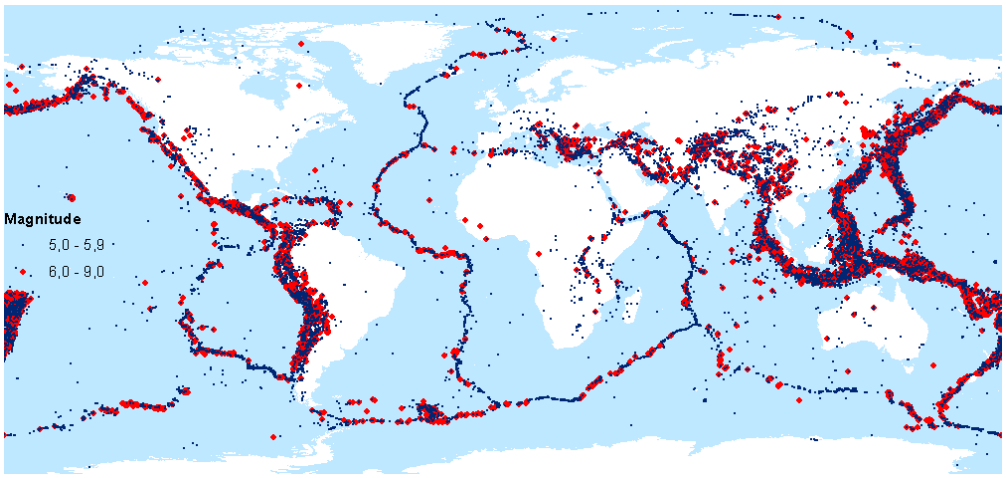


Figure 6. Epicentres of earthquakes of magnitude 5 or above on the Richter scale, 1973-2014

Source: The US Geological Survey.

4.2 Data on religiosity

The event study suffers from having few observations, since only a third of the districts are measured more than once. The three questions on religiosity available for most respondents are "How important is God in your life?", "Are you a religious person?", and "How often do you attend religious services?" These are available for 250 districts located in more than 30 countries. The remaining three measures of religiosity (beliefs in God, finding comfort in God, and beliefs in an Afterlife) are available for only half the number of districts in half the number of countries. Earthquakes do not affect these remaining measures of religiosity statistically in the present data (Online Appendix C.11).[44]

The panel is unbalanced. Some districts are interviewed in two consecutive years and others are interviewed with a gap of 18 years. The average is 5 years (Online Appendix C.7). In order not to loose important short-term effects, the main sample is restricted to districts measured with a gap of 10 years or less. The unbalancedness of the sample does not seem to influence results (Online Appendix C.7). The results are robust to different cut-offs and to estimating the levels-regressions of the district-aggregate of equation (2) with district fixed effects.[45]

[44] Insignificance may reflect that these three measures capture conversion rates, which are affected less than the *degree* of believing. Insignificance is not due to the smaller sample: Earthquakes continue to increase average importance of God and the share of religious persons in the smaller sample (Online Appendix C.11).

[45] Thanks to an anonymous referee for suggesting this.

4.3 Results

According to the religious coping hypothesis, adversity is expected to increase *intrinsic* religiosity, i.e. personal beliefs and private prayer. And not necessarily churchgoing. Figure 7 shows the average change in the two measures of intrinsic religiosity. Average importance of God fell by 0.2 pct points in the 327 district-years that were not hit by earthquakes compared to an increase of 1.8 pct points in the 39 district-years that were hit. The increase was more than double as large (4.0 pct points) in the 22 district-years that were hit, but where earthquakes are otherwise rare. The difference between the blue and red dot has a p-value of 0.08. The share of religious persons has fallen in all three samples, but only significantly in districts that were not hit by earthquakes. The difference between the blue and red dot has a p-value of 0.71. The degree of believing is more easily affected by adversity, while conversion rates are more persistent. Restricting the sample to districts measured with a gap of 6 years or less reduces the p-values of the difference between red and blue dots to 0.03 and 0.18, respectively (Online Appendix C.3).

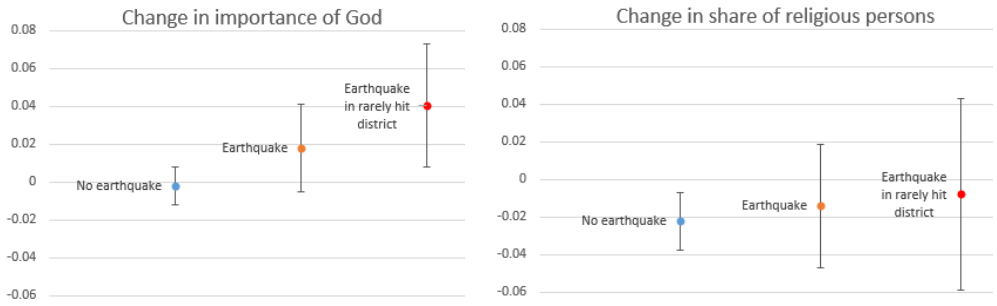


Figure 7. Average change in religiosity by earthquake or not

Notes. Lines show the 90 pct confidence bounds.

Next, I turn to more formal econometric analysis. Table 4 shows the results from estimating equation (2) and (3) for the three religiosity measures and the two measures of earthquake events. Baseline controls are included throughout and eight education dummies are added in even columns.[46] Earthquakes increase intrinsic religiosity, while churchgoing is unaffected (Panel A). These results are consistent with religious coping, but inconsistent with theories involving churchgoing. One concern is that churchgoing is

[46]The main results are qualitatively robust to estimating without controls (Online Appendix C.4).

insignificant because the sample is different from the other religiosity measures or because of the specific categorization of the variable. This concern does not seem to be borne out in the data: Churchgoing remains insignificant in different samples and with different categorizations (Online Appendix C.5.2 and C.11.1).

Earthquakes in districts that are otherwise rarely hit increase religiosity more than earthquakes in districts that are often hit (Panel B).[47] In fact, earthquakes in frequently hit districts do not increase religiosity.

One concern is that district-level trends correlate with earthquakes and the change in religiosity, which could be driving the results. The placebo test in Panel C addresses this concern by showing that future earthquakes have no effect on current religiosity.[48]

Average religiosity increases by 7.6 pct points in districts hit by one or more earthquakes, compared to districts that did not experience any earthquakes (based on column (1) in Panel A). This corresponds to increasing religiosity from the median district to the 80^{th} percentile (in terms of changes in religiosity). A one standard deviation increase in the probability of being hit by an earthquake increases intrinsic religiosity by 23-28% of a standard deviation, depending on whether the district is frequently hit by earthquakes or not. Conversion rates increase by 11-13% of a standard deviation (Online Appendix C.5.1).

[47] This finding is not driven by higher religiosity in high-risk districts: The finding is robust to adding initial religiosity and its' interaction with earthquakes (Online Appendix C.12.1).

[48] Current earthquakes continue to increase religiosity when added together with future earthquakes (Online Appendix C.9). Future earthquakes continue to have no effect on religiosity.

Table 4. OLS estimates of the change in religiosity on earthquakes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	Δimpgod		Δrelpers		Δservice		Δimpgod		Δrelpers		Δservice	
Earthquake measure:	Earthquake dummy								Number earthquakes			
Panel A. Baseline results												
Earthquake measure	0.076***	0.074***	0.053**	0.046**	0.034	0.031	0.027**	0.024***	0.022***	0.020***	0.015	0.014
	(0.023)	(0.021)	(0.021)	(0.019)	(0.030)	(0.037)	(0.010)	(0.008)	(0.007)	(0.006)	(0.009)	(0.010)
R-squared	0.335	0.314	0.414	0.413	0.509	0.507	0.325	0.304	0.413	0.412	0.508	0.506
Panel B. Allowing the impact of earthquakes to vary with how frequently a district is hit												
Earthquake measure	0.093***	0.086***	0.062**	0.060**	0.024	0.018	0.058**	0.053**	0.044***	0.043***	0.017	0.016
	(0.028)	(0.023)	(0.027)	(0.023)	(0.044)	(0.052)	(0.021)	(0.020)	(0.014)	(0.012)	(0.022)	(0.025)
Earthquake x Frequent earthquake	-0.073**	-0.060*	-0.058	-0.063*	0.014	0.046	-0.053***	-0.048**	-0.046**	-0.044***	-0.018	-0.017
	(0.029)	(0.031)	(0.041)	(0.033)	(0.077)	(0.090)	(0.019)	(0.019)	(0.018)	(0.014)	(0.025)	(0.029)
R-squared	0.338	0.316	0.417	0.415	0.513	0.513	0.333	0.311	0.417	0.415	0.513	0.512
Panel C. Placebo regressions												
Earthquake measure w+1	-0.027	-0.017	0.023	0.027	-0.064	-0.057	-0.025	-0.017	0.007	0.012	-0.050	-0.040
	(0.021)	(0.026)	(0.041)	(0.046)	(0.047)	(0.044)	(0.018)	(0.021)	(0.031)	(0.033)	(0.034)	(0.033)
Earthquake w+1 x Frequent earthquake	-0.015	-0.031	-0.005	-0.016	0.110*	0.120**	0.016	0.009	-0.007	-0.010	0.037	0.031
	(0.021)	(0.028)	(0.046)	(0.052)	(0.062)	(0.056)	(0.017)	(0.021)	(0.029)	(0.032)	(0.034)	(0.033)
R-squared	0.320	0.299	0.414	0.413	0.518	0.516	0.320	0.299	0.414	0.412	0.517	0.514
Observations	350	324	370	333	384	347	350	324	370	333	384	347
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eight education dummies	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Districts	236	230	250	240	264	254	236	230	250	240	264	254
Countries	31	30	31	30	32	31	31	30	31	30	32	31
Number Fixed effects	46	50	47	49	48	50	46	50	47	49	48	50

Notes. The unit of analysis is districts. The dependent variable is the change in average importance of God in col (1)-(2) and (7)-(8), the change in share of religious persons in col (3)-(4) and (9-10), and the change in average churchgoing in col (5)-(6) and (11)-(12). The earthquake measure is a dummy equal to one if one or more earthquakes hit the district in between interviews, zero otherwise (col 1-6) and the number of earthquakes (col 7-12). All columns include a constant. Standard errors (in parenthesis) are clustered at the country level. Asterisks ***, **, and * indicate significance at the 1, 5, and 10% level, respectively.

RESULTS: Earthquakes increase intrinsic religiosity and not churchgoing. The effect is larger in districts that are rarely hit. Future earthquakes do not affect current religiosity.

4.4 Heterogeneity

Earthquakes increase religiosity across all major denominations and continents, for individuals with different levels of initial religiosity and from all income and education groups (Online Appendices C.12 and C.13). Religiosity rises more in districts with lower *average* incomes, education levels, or population densities, but there is no difference across different levels of light density or unemployment rates.

4.5 Further robustness checks

This section summarizes further robustness checks detailed in Online Appendix C.

The results are robust to adding additional controls for initial religiosity, ethnic fixed effects, income fixed effects, the same list of alternative cultural values as in Section 3.4, religious denomination fixed effects, a year trend, and lagged earthquakes.

Consistent with existing studies on cultural values (e.g., Perrin & Smolek (2009) and Dinesen & Jæger (2013)), the impact of earthquakes on religiosity abates after a while. The impact on religiosity lasts up to 9-12 years, while the impact on conversion rates lasts 3 years. Churchgoing is not affected in any of the time windows, but this study cannot rule out that churchgoing could be affected in time windows shorter than 3 years.

One concern when differentiating with respect to the frequency at which a district is hit is that frequently hit districts with earthquakes are compared to districts without earthquakes and districts hit by an earthquake, but otherwise rarely hit. To tighten the comparison group, I restrict the sample to districts hit by at least one earthquake. Results are unchanged.

4.6 Event study vs cross-district results

One way to reconcile the results from the cross-district analysis and the event study is to regard the former as documenting long-term effects and the latter as documenting short-term effects. The short-term effect of earthquakes on importance of God is more than double the size of the long-term effect.[49] This difference is likely due to dynamics: While the short-term effect abates after a while, the long-term results indicate that a residual may survive, adding up to significant long-term differences. Another reason

[49] This calculation is based on dividing the standardized coefficient in column (1) of Table A32 with that in column (1) of Table A7: $\frac{|beta_{earth}|}{|beta_{dist(earthq)}|} = \frac{0.226}{0.082} = 2.756$

for the difference in the size of the effect could be that the risk measure is based on the continuous distance to high-risk zones and thus also includes smaller earthquakes. Indeed, the long-term effect is 30% larger for districts within 100 km of high-risk zones, compared to the full sample.

While only intrinsic religiosity is affected in the short term, both extrinsic and intrinsic religiosity are affected in the long term. If anything, it seems that as people become more religious, they go more to church. Not the other way around. Buddhist beliefs increase in the aftermath of earthquakes, but this effect vanishes in the long term: Buddhists in high-risk areas are not more religious than Buddhists in low-risk areas. Perhaps Buddhist beliefs are more efficient in providing stress relief than other beliefs, thus reducing the need for religion in the long term.

An earthquake in poorer districts is more likely to increase average religiosity, compared to one in richer districts. This differential effect seems to vanish over time: Increased earthquake risk is equally likely to increase religiosity in poor and rich districts. The implicit inclusion of small earthquakes in the risk measure could explain this difference between results. But the different results may also be due to transmission of religiosity across space or generations. The latter is investigated below.

5 Epidemiological approach

The religious coping hypothesis concerns the immediate effect on religiosity from adverse life events, and is silent on transmission across generations. Whether religiosity is passed on through generations can be investigated in a model of cultural transmission (Bisin & Verdier (2001)). Parents transmit a particular cultural trait to their children if this grants utility to parents or children. Studies find that religious individuals often have better mental health (Miller *et al.* (2014), Park *et al.* (1990)), higher life satisfaction (Ellison *et al.* (1989), Campante & Yanagizawa-Drott (2015)), are better able to cope with adverse life events (Clark & Lelkes (2005)), and engage less in deviant behavior (Lehrer (2004)).[50] Thus, religion might have some benefits that parents would like to transmit to their children.[51]

[50] See also reviews by Smith *et al.* (2000) and Pargament (2001).

[51] Another way to think of the transmission of religiosity is that people who believe in God will pass this "worldview" on to their children like any other knowledge of the World. People who do not believe in God will also pass on this disbelief.

This section investigates whether second generation immigrants are more religious when their parents came from a country with higher earthquake risk, compared to those with parents from lower earthquake risk areas. The method is also called the epidemiological approach (e.g., Fernandez (2011)). I estimate the following equation:[52]

$$religiosity_{cjat} = \alpha + \beta earthquake_a + r_{ct} + X'_{cjat}\eta + W'_a\delta + V'_{jat}\lambda + \varepsilon_{cjat},$$

where $religiosity_{cjat}$ is the religiosity level of individual j interviewed at time t living in country c in which he/she was born, and with parents who migrated from country a. $earthquake_a$ is earthquake risk in the country of origin, as described in Section 3.4. r_{ct} is country of residence by year fixed effects. This removes any country-level factors in the individual's current environment, such as institutions, earthquake frequency, and average religiosity. X_{cjt} is a vector of individual-level controls. W_a are factors in the parents' country of origin that are likely to correlate with earthquake risk and religiosity. V_{jat} is a vector of socioeconomic characteristics of the parents.

I use the European Social Survey (ESS), which includes five survey rounds over the period 2004-2012 for 17,587 individuals whose parents were born in 171 different countries.[53] The surveys include three questions on religiosity: (1) How often do you pray apart from at religious services? (1="Never", ..., 7="Every day"), (2) How religious are you? (1="Not at all religious", ..., 10="Very religious"), and (3) How often do you attend religious services apart from special occasions? (1="Never", ..., 6="More than once a week").[54] I rescaled the variables to lie between 0 and 1. In cases where the parents migrated from different countries, I use the mothers' country of origin.[55]

Individuals whose parents came from a country with high earthquake risk pray more often, regard themselves as more religious, and attend religious services more often than those whose parents came from less earthquake prone countries (Panel A, Table 5). The

[52]The equation is estimated by OLS, but results are robust to using instead ordered logit estimation.

[53]The ESS is available at www.europeansocialsurvey.org. Another dataset with information on the religiosity of second generation immigrants is the General Social Survey (GSS) conducted in the United States. However, the respondents only come 30 countries and two aggregated regions, compared to 171 countries in the ESS.

[54]The frequency of attending religious services was originally a variable running from 1="Never" to 7="Every day". Due to few observations in the latter category, I merged 7 and 6="More than once a week". The results are unchanged if using the original variable (Online Appendix Table A60).

[55]Results are robust to focusing on the fathers' country of origin (Online Appendix Table A61).

result is robust to adding controls for absolute latitude, continent dummies, and distance to the coast in the parents' country of origin (columns 2, 5, and 8) and to adding individual-level characteristics (age, age squared, sex, and the five education fixed effects) and five fixed effects for parents' education (columns 3, 6, and 9).

Corroborating the cross-district results in Table 2, the impact of earthquake risk is unchanged when restricting to individuals whose parents came from countries not directly located in high-risk earthquake zones (Panel B). Again, the impact of distance diminishes with distance (Panel C).

The results in Table 5 are consistent with the idea that high earthquake risk instigates a culture of high religiosity which is passed on through generations. People who have never themselves experienced an earthquake can still be influenced by the disasters experienced by earlier generations, in terms of increased religiosity.

Additional robustness checks are detailed in Online Appendix D, summarized here. The results are robust to adding a dummy for whether the respondent belongs to an ethnic minority, denomination fixed effects, ten income fixed effects, and to adding additional country-of-origin controls (pct Muslims, Christians, Jews, Buddhists, and Hindus, real GDP per capita, and measures of democracy and property rights). The results for prayer are robust to different categorizations of the variable. The results for religious person and churchgoing are not robust, which supports the results in the remainder of the paper. The exercise in Table 5 implicitly assumes that higher earthquake risk increases religiosity in the country of origin, and next that this higher religiosity is transmitted across generations. Consistent with this idea, I find that religiosity in the parents' country of origin increases their childrens' religiosity. Last, one could expect some bias arising from the fact that the analysis in this section ignores variation within country of origin. This bias does not seem to be large.

Table 5. OLS estimates of religiosity on earthquake risk in parents' home country

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	pray	pray	pray	religious	religious	religious	service	service	service
Panel A. Simple linear effect									
Dist(earthq zones),	-0.050***	-0.036***	-0.028**	-0.054***	-0.039***	-0.031**	-0.041***	-0.027**	-0.021**
1000 km	(0.014)	(0.011)	(0.011)	(0.017)	(0.014)	(0.013)	(0.014)	(0.011)	(0.010)
Observations	17,155	17,058	14,156	17,271	17,174	14,250	17,334	17,236	14,304
R-squared	0.122	0.129	0.175	0.074	0.085	0.129	0.100	0.110	0.127
Org countries	171	166	155	171	166	155	171	166	155
Panel B. Excluding countries of origin in high-risk zones									
Dist(earthq zones),	-0.044***	-0.038***	-0.026**	-0.047***	-0.039***	-0.030**	-0.036***	-0.027**	-0.018**
1000 km	(0.015)	(0.011)	(0.011)	(0.017)	(0.013)	(0.014)	(0.012)	(0.010)	(0.009)
Observations	15,787	15,784	9,367	15,894	15,891	9,407	15,957	15,954	9,435
R-squared	0.105	0.112	0.159	0.062	0.072	0.122	0.094	0.102	0.127
Org countries	139	136	123	139	136	122	139	136	123
Panel C. Including squared earthquake risk									
Dist(earthq zones),	-0.130***	-0.079***	-0.068**	-0.121***	-0.059**	-0.048*	-0.090***	-0.042**	-0.033
1000 km	(0.021)	(0.024)	(0.027)	(0.027)	(0.026)	(0.027)	(0.027)	(0.019)	(0.021)
Dist(earthq zones)	0.049***	0.024*	0.023	0.041***	0.011	0.010	0.029**	0.009	0.007
squared	(0.010)	(0.014)	(0.017)	(0.013)	(0.014)	(0.017)	(0.012)	(0.010)	(0.008)
Observations	17,155	17,058	14,156	17,271	17,174	14,250	17,334	17,236	14,304
R-squared	0.123	0.130	0.175	0.075	0.085	0.129	0.101	0.110	0.127
Impact at 500 km	-0.105	-0.0666	-0.0566	-0.101	-0.0532	-0.0432	-0.0749	-0.0377	-0.0293
Country-year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Geo controls	N	Y	Y	N	Y	Y	N	Y	Y
Parent and respondent									
controls	N	N	Y	N	N	Y	N	N	Y

Notes. The unit of analysis is a second generation immigrant. The dependent variable is answers to the question: "How often do you pray apart from at religious services?" in col (1)-(3), "How religious are you?" in col (4)-(6), and "How often do you attend religious services apart from special occations?" in col (7)-(9). Dist(earthq zones) measures distance to the nearest high risk earthquake zone. "Geo controls" indicates country of origin controls for continent dummies (Africa, Asia, Australia and Oceania, Europe, North America, and South America), absolute latitude, and distance to the coast. "Parent and respondent controls" indicates five education fixed effects for parents and respondent, and controls for the respondent's age, age squared, and sex. Standard errors (in parenthesis) are two-way clustered at the country of residence and parents' country of origin. Asterisks ***, **, and * indicate significance at the 1, 5, and 10% level, respectively.

RESULTS: Second generation immigrants from countries with higher earthquake risk are more religious than their peers living in the same country, but whose parents came from countries with lower earthquake risk.

6 Conclusion

Exploiting natural disasters as a determinant of random and adverse life events, I find that individuals across the globe become more religious when hit by earthquakes. Particularly individuals in districts that are otherwise rarely hit. The effect of any earthquake lasts 3-12 years, but a residual impact remains and is transmitted across generations. The main results are based on global surveys, but similar patterns emerge for alternative measures of religiosity based on Google searches: People google religious terms more as a share of their total searches in US states with higher earthquake risk, compared to states with lower risk of earthquakes.

The results across all three analyses are consistent with religious coping, which involves using religion psychologically to cope with unbearable and unpredictable events. This conclusion is based on three main checks. First, if the mechanism is psychological, people do not have to be hit directly by the earthquake in order to use religion for stress relief. The data corroborate this idea: Religiosity increases after an earthquake has hit a *neighbouring* district. Likewise, long-term religiosity is higher in districts neighbouring the high-risk districts, compared to districts further away. This indicates that individuals might use religion to cope with the distress caused by earthquakes that hit friends or family members in neighbouring districts.

Second, the literature on religious coping agrees that people are more likely to use religion to cope with unpredictable events, compared to predictable ones (where people use problem-focused coping to a larger extent). In accordance with this, I find that only surprising disasters (earthquakes, tsunamis, and volcanic eruptions) and surprising earthquakes (in districts otherwise rarely hit) increase religiosity. Unsurprising disasters (tropical storms) and unsurprising earthquakes (in districts frequently hit) do not. The third check used to investigate whether results are consistent with religious coping is based on the idea from the religious coping literature that people use their intrinsic religiosity to cope with adversity to a larger extent than churchgoing. The event study and the study using Google searches corroborate this idea: Only intrinsic religiosity increases in response to earthquakes, while churchgoing is unchanged. The estimate on churchgoing in the cross-district analysis is smaller than the estimate on intrinsic religiosity, but not statistically.

Some of the results are also consistent with alternative explanations. For instance, the results in the event study are also consistent with the idea that certain types of people move in and out of districts before and after earthquakes, perhaps as aid workers. But only religious coping can explain *all* results across all analyses.

Earthquakes increase religiosity across the major religious denominations, confirming the idea by early scholars such as Karl Marx and Sigmund Freud, that all religions provide a psychological coping mechanism. This rules out a distinct theological channel. Likewise, people from all income and education groups are likely to respond to earthquakes with increased religiosity. It seems these people have similar psychological needs, despite their different economic needs.

The empirical analyses overall point to a core psychological explanation of religion. Religious coping provides a stable reason for why people believe in God. Coping, therefore, may be one reason why religion has not vanished as some scholars have theorized.

References

Abu-Raiya, Hisham, & Pargament, Kenneth I. 2015. Religious coping among diverse religions: Commonalities and divergences. *Psychology of Religion and Spirituality*, **7**(1), 24.

Ager, P., Hansen, C. W., & Loenstrup, L. 2016. Church Membership and Social Insurance: Evidence from the Great Mississippi Flood of 1927. *University of Southern Denmark Discussion Papers on Business and Economics*, **7**.

Ager, Philipp, & Ciccone, Antonio. 2018. Agricultural risk and the spread of religious communities. *Journal of the European Economic Association*, **16**(4), 1021–1068.

Ahlerup, Pelle. 2013. Are Natural Disasters Good for Economic Growth? *Univeristy of Gothenburg Working Paper*, **553**.

Alesina, A.F., Giuliano, P., & Nunn, N. 2013. On the origins of gender roles: Women and the plough. *Quarterly journal of Economics*, **128**(2), 469–530.

Altonji, Joseph G, Elder, Todd E, & Taber, Christopher R. 2005. Selection on observed and unobserved variables: Assessing the effectiveness of Catholic schools. *Journal of political economy*, **113**(1), 151–184.

Andersen, Thomas Barnebeck, Bentzen, Jeanet, Dalgaard, Carl-Johan, & Sharp, Paul. 2017. Pre-reformation Roots of the Protestant Ethic. *The Economic Journal*, **127**(604), 1756–1793.

Ano, Gene G, & Vasconcelles, Erin B. 2005. Religious coping and psychological adjustment to stress: A meta-analysis. *Journal of clinical psychology*, **61**(4), 461–480.

Becker, S.O., & Woessmann, L. 2009. Was Weber wrong? A human capital theory of Protestant economic history. *The Quarterly Journal of Economics*, **124**(2), 531–596.

Belloc, Marianna, Drago, Francesco, & Galbiati, Roberto. 2016. Earthquakes, Religion, and Transition to Self-Government in Italian Cities. *The Quarterly Journal of Economics*, **131**(4), 1875–1926.

Bentzen, Jeanet Sinding. 2013. Origins of religiousness: The role of natural disasters. *Univ. of Copenhagen Dept. of Economics Discussion Paper*.

Binzel, Christine, & Carvalho, Jean-Paul. 2017. Education, social mobility and religious movements: The Islamic revival in Egypt. *The Economic Journal*, **127**(607), 2553–2580.

Bisin, Alberto, & Verdier, Thierry. 2001. The economics of cultural transmission and the dynamics of preferences. *Journal of Economic theory*, **97**(2), 298–319.

Bjorck, Jeffrey P, & Cohen, Lawrence H. 1993. Coping with threats, losses, and challenges. *Journal of Social and Clinical Psychology*, **12**(1), 56–72.

Buggle, Johannes Christoph, & Durante, Ruben. 2017. Climate risk, cooperation, and the co-evolution of culture and institutions. *CEPR Discussion Paper DP12380*.

Buser, Thomas. 2015. The effect of income on religiousness. *American Economic Journal: Applied Economics*, **7**(3), 178–95.

Campante, Filipe, & Yanagizawa-Drott, David. 2015. Does religion affect economic growth and happiness? Evidence from Ramadan. *The Quarterly Journal of Economics*, **130**(2), 615–658.

Cantoni, Davide. 2015. The economic effects of the Protestant Reformation: testing the Weber hypothesis in the German lands. *Journal of the European Economic Association*, **13**(4), 561–598.

Carl Pieper, DPH, Meador, Keith G, & Sheip, Frank. 1992. Religious coping and depression among elderly, hospitalized medically ill men. *American Journal of Psychiatry*, **1**(49), 1–2.

Cavallo, Eduardo, Galiani, Sebastian, Noy, Ilan, & Pantano, Juan. 2013. Catastrophic natural disasters and economic growth. *Review of Economics and Statistics*, **95**(5), 1549–1561.

Chen, Daniel L. 2010. Club Goods and Group Identity: Evidence from Islamic Resurgence during the Indonesian Financial Crisis. *Journal of Political Economy*, **118**(2), 300–354.

Clark, Andrew, & Lelkes, Orsolya. 2005. Deliver us from evil: religion as insurance. *Papers on Economics of Religion*, **603**, 1–36.

Clark, Walter Houston. 1958. How do social scientists define religion? *The Journal of Social Psychology*, **47**(1), 143–147.

Cohen, S., & Wills, T.A. 1985. Stress, social support, and the buffering hypothesis. *Psychological bulletin*, **98**(2), 310–357.

Conway, K. 1985. Coping with the stress of medical problems among black and white elderly. *The International Journal of Aging and Human Development*, **21**(1), 39–48.

Dehejia, Rajeev, DeLeire, Thomas, & Luttmer, Erzo FP. 2007. Insuring consumption and happiness through religious organizations. *Journal of Public Economics*, **91**(1), 259–279.

Dinesen, Peter Thisted, & Jæger, Mads Meier. 2013. The effect of terror on institutional trust: New evidence from the 3/11 Madrid terrorist attack. *Political Psychology*, **34**(6), 917–926.

Ellison, Christopher G, Gay, David A, & Glass, Thomas A. 1989. Does religious commitment contribute to individual life satisfaction? *Social Forces*, **68**(1), 100–123.

Fernandez, R. 2011. *Does culture matter?* The Netherlands: North-Holland.

Feuerbach, Ludwig. 1957. *The essence of Christianity.* Barnes & Noble Publishing.

Fisker, Peter Simonsen. 2012. Earthquakes and economic growth. *Development Research Working Paper Series 01/2012.*

Freud, Sigmund. 1927. *The future of an illusion.* Broadview Press.

Galor, Oded, & Özak, Ömer. 2016. The Agricultural Origins of Time Preference. *American Economic Review*, 3064.

Greif, Avner. 1994. Cultural beliefs and the organization of society: A historical and theoretical reflection on collectivist and individualist societies. *Journal of political economy*, 912–950.

Gruber, Jonathan, & Hungerman, Daniel M. 2008. The Church Versus the Mall: What Happens When Religion Faces Increased Secular Competition? *The Quarterly journal of economics*, **123**(2), 831–862.

Guiso, L., Sapienza, P., & Zingales, L. 2003. People's opium? Religion and economic attitudes. *Journal of Monetary Economics*, **50**(1), 225–282.

Gurin, Gerald, Veroff, Joseph, & Feld, Sheila. 1960. *Americans view their mental health: A nationwide interview survey.* New York: Basic Books.

Hall, D.D. 1990. *Worlds of wonder, days of judgment: Popular religious belief in early New England*. Harvard University Press.

Iannaccone, Laurence R. 1998. Introduction to the Economics of Religion. *Journal of economic literature*, **36**(3), 1465–1495.

Inglehart, R., & Baker, W.E. 2000. Modernization, cultural change, and the persistence of traditional values. *American sociological review*, 19–51.

Inglehart, R., & Norris, P. 2003. *Rising tide: Gender equality and cultural change around the world*. Cambridge University Press.

Iyer, Sriya. 2016. The new economics of religion. *Journal of Economic Literature*, **54**(2), 395–441.

Johnson, Sarah C, & Spilka, Bernard. 1991. Coping with breast cancer: The roles of clergy and faith. *Journal of Religion and Health*, **30**(1), 21–33.

Kimball, Miles S, Mitchell, Colter M, Thornton, Arland D, & Young-Demarco, Linda C. 2009. Empirics on the origins of preferences: The case of college major and religiosity. *National Bureau of Economic Research w15182*.

Koenig, Harold G, George, Linda K, & Peterson, Bercedis L. 1998. Religiosity and remission of depression in medically ill older patients. *American Journal of Psychiatry*, **155**(4), 536–542.

Koenig, H.G., George, L.K., & Siegler, I.C. 1988. The use of religion and other emotion-regulating coping strategies among older adults. *The Gerontologist*, **28**(3), 303–310.

Lazarus, R.S., & Folkman, S. 1984. *Stress, appraisal, and coping*. Springer Publishing Company.

Lehrer, Evelyn L. 2004. Religion as a determinant of economic and demographic behavior in the United States. *Population and development review*, **30**(4), 707–726.

Marx, Karl. 1867. *Capital: A critique of political economy*. The Penguin Group.

Mattlin, Jay A, Wethington, Elaine, & Kessler, Ronald C. 1990. Situational determinants of coping and coping effectiveness. *Journal of Health and Social Behavior*, 103–122.

McCleary, R.M., & Barro, R.J. 2006. Religion and economy. *The Journal of Economic Perspectives*, **20**(2), 49–72.

Miller, Lisa, Bansal, Ravi, Wickramaratne, Priya, Hao, Xuejun, Tenke, Craig E, Weissman, Myrna M, & Peterson, Bradley S. 2014. Neuroanatomical correlates of religiosity and spirituality: A study in adults at high and low familial risk for depression. *JAMA psychiatry*, **71**(2), 128–135.

Norenzayan, A., & Hansen, I.G. 2006. Belief in supernatural agents in the face of death. *Personality and Social Psychology Bulletin*, **32**(2), 174–187.

Norenzayan, A., & Shariff, A.F. 2008. The origin and evolution of religious prosociality. *Science*, **322**(5898), 58–62.

Norris, Pippa, & Inglehart, Ronald. 2011. *Sacred and secular: Religion and politics worldwide*. Cambridge University Press.

Nunn, N., & Wantchekon, L. 2011. The Slave Trade and the Origins of Mistrust in Africa. *American Economic Review*, **101**(7).

Nunn, Nathan, & Puga, Diego. 2012. Ruggedness: The blessing of bad geography in Africa. *Review of Economics and Statistics*, **94**(1), 20–36.

Ono, K. 1987. Superstitious behavior in humans. *Journal of the Experimental Analysis of Behavior*, **47**(3), 261.

Pargament, K.I. 2001. *The psychology of religion and coping: Theory, research, practice*. Guilford Press.

Park, C., Cohen, L.H., & Herb, L. 1990. Intrinsic religiousness and religious coping as life stress moderators for Catholics versus Protestants. *Journal of personality and social psychology*, **59**(3), 562.

Penick, J.L. 1981. *The New Madrid Earthquakes*. University of Missouri.

Perrin, Andrew J, & Smolek, Sondra J. 2009. Who trusts? Race, gender, and the September 11 rally effect among young adults. *Social science research*, **38**(1), 134–145.

Ray, Gene. 2004. Reading the Lisbon earthquake: Adorno, Lyotard, and the contemporary sublime. *The Yale Journal of Criticism*, **17**(1), 1–18.

Scheve, K., & Stasavage, D. 2006. Religion and preferences for social insurance. *Quarterly Journal of Political Science*, **1**(3), 255–286.

Schuster, M.A., Stein, B.D., Jaycox, L.H., Collins, R.L., Marshall, G.N., Elliott, M.N., Zhou, A.J., Kanouse, D.E., Morrison, J.L., & Berry, S.H. 2001. A national survey of stress reactions after the September 11, 2001, terrorist attacks. *New England Journal of Medicine*, **345**(20), 1507–1512.

Sibley, Chris G, & Bulbulia, Joseph. 2012. Faith after an earthquake: A longitudinal study of religion and perceived health before and after the 2011 Christchurch New Zealand earthquake. *PloS one*, **7**(12), e49648.

Siebert, L., & Simkin, T. 2002. Volcanoes of the world: An illustrated catalog of Holocene volcanoes and their eruptions. *Smithsonian Institution, Global Volcanism Program, Digital Information Series GVP-3 (http://www. volcano. si. edu/world)*.

Skinner, B.F. 1948. 'Superstition'in the pigeon. *Journal of experimental psychology*, **38**(2), 168.

Smith, Bruce W, Pargament, Kenneth I, Brant, Curtis, & Oliver, Joan M. 2000. Noah revisited: Religious coping by church members and the impact of the 1993 Midwest flood. *Journal of Community Psychology*, **28**(2), 169–186.

Sosis, R. 2008. Pigeons, foxholes, and the book of Psalms. *In:* Bulbulia, J, Sosis R. Harris E. Genet R. Genet C., & Wyman, K. (eds), *Evolution of Religion: Studies, Theories, and Critiques*. Collins Foundation Press.

Sosis, Richard, & Handwerker, W Penn. 2011. Psalms and coping with uncertainty: Religious Israeli women's responses to the 2006 Lebanon War. *American Anthropologist*, **113**(1), 40–55.

Stark, Rodney, & Finke, Roger. 2000. *Acts of faith: Explaining the human side of religion*. Univ of California Press.

Trzebiatowska, Marta, & Bruce, Steve. 2012. *Why are women more religious than men?* Oxford University Press.

Van De Wetering, M. 1982. Moralizing in Puritan natural science: Mysteriousness in earthquake sermons. *Journal of the History of Ideas*, 417–438.

Voigtländer, Nico, & Voth, Hans-Joachim. 2012. Persecution perpetuated: the medieval origins of anti-Semitic violence in Nazi Germany. *Quarterly Journal of Economics*, **127**(3), 1339–1392.

Weber, M. 1930. trans. Talcott Parsons. *The Protestant Ethic and the Spirit of Capitalism*.

Williams, D.R., Larson, D.B., Buckler, R.E., Heckmann, R.C., & Pyle, C.M. 1991. Religion and psychological distress in a community sample. *Social Science & Medicine*, **32**(11), 1257–1262.

Online Appendix

A Matching subnational districts

Steps in matching gridded data with the regional information in the pooled WVS/EVS:

1. The disaster data is available at the grid-cell level, while the finest spatial information in the pooled WVS/EVS 1981-2009 is variable x048 indicating the subnational district where the interview was conducted. The WVS/EVS "districts" can be both actual districts, but in a few cases also cities. The two types of information are matched with a shapefile from ESRI with first administrative districts across the globe, which means a unit of disaggregation just below the country-level.

2. The ESRI-shapefile also has information on the type of land within the district: Primary land, large island, medium island, small island, and very small island. To prevent averaging across for instance islands and primary land, the five categories are ranked with primary land as the preferred and very small island as the least preferred. When a district is divided into several polygons, only the highest ranked polygon is kept.

3. In many cases, the x048 variable varies across time. For instance, the same country can be divided into 15 districts in one year and only five larger districts in another year. The most disaggregate division is chosen, provided that it matches the shapefile for first administrative districts as well as possible.

4. For many countries, the level of aggregation in the ESRI shapefile is different from that in the district identifier, x048, from EVS/WVS. In these cases, the districts are aggregated to the finest level possible.

5. The districts are illustrated in Figure 2 in the paper. The districts included in the cross-district analysis encompass both types of green, while the districts included in the event study are indicated with dark green.

B Additional results for cross-district analysis

Most robustness checks replicate Panel A of Table 2, but to keep the tables from exploding in size, checks replicate only column (8) of the same table when more parameters are changed. This specification uses the preferred aggregate measure, Strength of Intrinsic Religiosity Scale.

B.1 Summary statistics

Table A1. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Strength of Religiosity Scale	106,054	.736	.296	0	1
Strength of Intrinsic Religiosity Scale	107,022	0.775	0.311	0	1
Dist(earthquakes) 1000 km	211,883	.441	.544	0	3.355
Age	207,293	41.602	16.555	15	108
Male	209,899	.478	.500	0	1
Married dummy	211,193	.575	.494	0	1
Absolute latitude	211,883	34.174	15.064	.119	67.669
Dist(coast) 1000 km	211,883	.239	.257	0	1.990
Earthquake dummy period t	211,714	.068	.250	0	1
Earthquake dummy period t	211,714	.073	.259	0	1
Year	211,883	2002	6.060	1981	2009

Table A2. Differences in means based on median earthquake risk

Sample	Full		Below median risk		Above median risk		Difference	Difference after geo
Variable	Obs	Mean	Obs	Mean	Obs	Mean		var accounted for
Intrinsic religiosity	107,022	0.775	47,178	0.702	59,844	0.834	0.132***	0.028***
Male	209,730	0.478	105,665	0.470	104,065	0.486	0.015***	-0.011**
Married	211,034	0.575	105,658	0.562	105,376	0.587	0.025***	0.012
Age	207,292	41.602	104,507	43.161	102,785	40.017	-3.145***	-0.415
Income category	159,712	4.570	75,673	4.797	84,039	4.365	-0.432***	-0.156
Education category	196,123	4.505	99,422	4.495	96,701	4.514	0.019*	0.116
Lights per km2	210,787	0.101	105,902	0.009	104,885	0.194	0.185***	-0.006
Unemployed	206,206	0.095	105,162	0.091	101,044	0.099	0.008***	-0.004

Notes. Geographic variables include dummies for earthquake in year t and t-1, distance to the coast, absolute latitude, and country fixed effects.

B.2 Different earthquake risk measures

The main measure of earthquake intensity throughout Section 3.4 is the distance to earthquake zones 3 or 4. Table A3 reproduces column (8) of Panel A of Table 2 using distance (and log distance) to zones 1-4, 2-4, 3-4, and 4. Table A4 uses instead the average value of earthquake zones across pixels within a district. Panel A of Table A4 shows that the result

that the result is maintained across all religiosity measures when all controls, except country-by-year fixed effects, are included. Panel B shows that the mean-measure does not hold enough within-country variation to exert an effect on churchgoing and the feeling that God gives comfort within countries. The no-effect on churchgoing is consistent with the religious coping literature. Panel C shows that the distance to earthquake zones wins the horse race between the two measures. This may be because the mean-based measure does not vary for the districts that lie outside the earthquake zones 1-4. For these districts, the measure takes the value zero. However, the actual probability of an earthquake hitting is not equal to zero. This can be realized when comparing Figures 3 and 6; some earthquakes hit in earthquake zones zero. The distance-based measure captures better this variation.

Table A3. Main results with alternative earthquake measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable: Strength of Intrinsic Religiosity Scale										
Distance to earthq zones 1-4	-0.061**									
	(0.029)									
Distance to earthq zones 2-4		-0.084***								
		(0.029)								
Distance to earthq zones 3-4			-0.063***							
			(0.016)							
Distance to earthq zone 4				-0.027***						
				(0.008)						
Log (1+) Dist(earthq zones 1-4)					-0.086**					
					(0.040)					
Log (1+) Dist(earthq zones 2-4)						-0.122***				
						(0.042)				
Log (1+) Dist(earthq zones 3-4)							-0.096***			
							(0.024)			
Log (1+) Dist(earthq zone 4)								-0.076***		
								(0.018)		
Distance to fault line									-0.037***	
									(0.011)	
Log (1+) Dist(fault line)										-0.058***
										(0.019)
Observations	104,040	104,040	104,040	104,040	104,040	104,040	104,040	104,040	102,112	102,112
R-squared	0.325	0.325	0.325	0.325	0.325	0.326	0.325	0.326	0.318	0.318
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Regions	591	591	591	591	591	591	591	591	579	579
Countries	66	66	66	66	66	66	66	66	66	66

Notes. The dependent variable is the Strength of Intrinsic Religiosity Scale [0,1]. Baseline controls are the same as Panel A, Table 2.

Table A4. Main results with average earthquake zones as risk measure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	impgod	relpers	service	comfort	believe	afterlife	SRS	SIRS
Panel A. Excluding country-by-year FE								
Mean earthquake zone	0.123***	0.105***	0.036*	0.072**	0.087***	0.063*	0.063**	0.073***
	(0.032)	(0.030)	(0.020)	(0.033)	(0.029)	(0.035)	(0.026)	(0.027)
Observations	198,265	192,121	196,861	126,196	129,911	120,073	103,283	104,041
R-squared	0.192	0.054	0.151	0.100	0.085	0.058	0.145	0.130
District and indl controls	Y	Y	Y	Y	Y	Y	Y	Y
Panel B. Including country-by-year FE								
Mean earthquake zone	0.039***	0.025*	0.008	0.009	0.013*	0.042**	0.016*	0.019**
	(0.014)	(0.013)	(0.010)	(0.012)	(0.007)	(0.020)	(0.008)	(0.009)
Observations	198,264	192,120	196,860	126,195	129,910	120,072	103,282	104,040
R-squared	0.406	0.207	0.278	0.263	0.226	0.201	0.336	0.325
District and indl controls	Y	Y	Y	Y	Y	Y	Y	Y
Country-by-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Panel C. Horse race								
Mean earthquake zone	0.029**	0.016	-0.000	-0.001	0.008	0.025	0.007	0.009
	(0.012)	(0.013)	(0.009)	(0.011)	(0.006)	(0.018)	(0.007)	(0.007)
Distance to earthq zones 3-4	-0.043***	-0.039**	-0.035**	-0.060***	-0.033*	-0.107***	-0.059***	-0.060***
	(0.014)	(0.020)	(0.016)	(0.021)	(0.018)	(0.026)	(0.016)	(0.016)
Observations	198,264	192,120	196,860	126,195	129,910	120,072	103,282	104,040
R-squared	0.407	0.208	0.278	0.263	0.226	0.202	0.337	0.325
District and indl controls	Y	Y	Y	Y	Y	Y	Y	Y
Country-by-year FE	Y	Y	Y	Y	Y	Y	Y	Y

Notes. Panel A and B replicate Panel A of Table 2 with the average of earthquake zones as an alternative measure of long-term earthquake risk, excluding country-by-year FE in Panel A and including them in Panel B. Panel C includes country-by-year FE and works as a horse race between the mean earthquake measure and the distance measure. District and individual controls for distance to coast, absolute latitude, individuals' age, age squared, sex, and marital status

B.3 The impact of earthquakes in surrounding areas

I show below whether people in surrounding areas are affected by earthquakes that did not hit their local neighbourhood. I do so by showing that google searches on earthquakes also increase in surrounding areas after one specific earthquake. The United States is a suitable place to investigate google searches, as the assumption that everyone has access to the internet is rather believable. I pick the South Napa Earthquake, that hit Napa Valley in California on the 24th of August 2014. The consequences included reconstruction costs for around 1 billion dollars, 1 dead, and 200 injured. The earthquake had a score of 6.0 on the Richter scale.

The maps below show the share of total google searches that included the search term

"South Napa earthquake" in year 2014.[55] Results are similar for searches on "earthquake". The state with the highest share of searches on "South Napa earthquake" is California, followed by Hawaii and states located close to California. These other states were not hit by the earthquake, but searched for information about it nevertheless. Similarly with metropolitan areas; areas closer to the epicenter searched more for information.

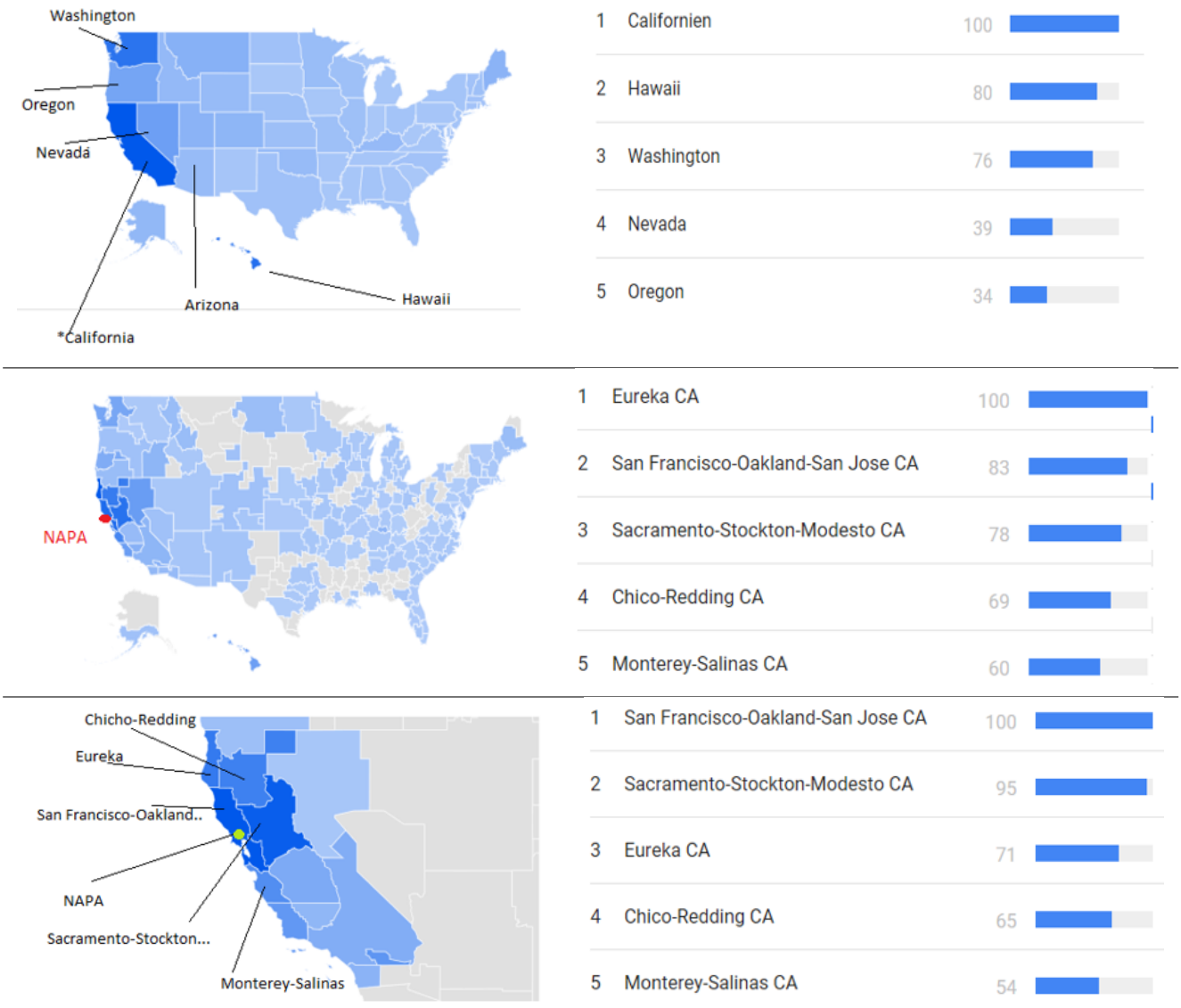


Figure A1. Google searches on "South Napa earthquake"

[55]Ideally, I would have liked to restrict the analysis to the period just after the earthquake, but Google trends only allows restricting the searches to one specific year. The vast majority of searches on "South Napa earthquake" in 2014 occurred in the month after the South Napa earthquake.

B.4 Number of individuals in each subnational district

While the main regressions are estimated for districts with more than 10 respondents per year, Table A5 shows the results for the full sample and the sample excluding districts with less than 10, 20, 30, 40, 50, 75, and 100 respondents respectively.

Table A5. Main results restricted by number of respondents within each district

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable: Strength of Intrinsic Religiosity Scale								
Dist(earthq), 1000km	-0.063***	-0.063***	-0.064***	-0.064***	-0.063***	-0.065***	-0.069***	-0.071***
	(0.016)	(0.016)	(0.017)	(0.017)	(0.017)	(0.017)	(0.019)	(0.021)
Observations	104,122	104,040	103,651	102,860	101,421	99,022	94,590	88,688
R-squared	0.325	0.325	0.325	0.325	0.325	0.325	0.323	0.321
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y
Sample	Full	>10	>20	>30	>40	>50	>75	>100
Districts	600	591	565	529	501	450	383	315

Notes. OLS estimates. The table replicates column (8) of Panel A of Table 2, varying the criteria for the minimum number of respondents in the district. Sample refers to whether the sample is unrestricted (full sample) or restricted to districts with more than 10, 20, 30, 40, 50, 75, or 100 respondents, respectively.

Table A6 replicates Panel A of Table 2, weighting the observations by the number of respondents in each district.

Table A6. Main results weighted by number respondents

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	impgod	relpers	service	comfort	believe	afterlife	rel	reli
Dist(earthq), 1000km	-0.050***	-0.062***	-0.047**	-0.039*	-0.026*	-0.124***	-0.055***	-0.054***
	(0.016)	(0.020)	(0.021)	(0.022)	(0.015)	(0.023)	(0.015)	(0.016)
Observations	198,527	192,387	197,121	126,291	130,019	120,170	103,363	104,122
R-squared	0.393	0.173	0.267	0.233	0.204	0.176	0.313	0.297
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y
Regions	911	907	893	620	602	602	600	600
Countries	85	84	83	67	66	66	66	66

Notes. The table replicates Panel A of Table 2 where observations are weighted with the number of respondents in each district.

B.5 Standardized coefficients

Table A7. Main results with standardized betas

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. var.	impgod	relpers	service	comfort	believe	afterlife	rel	reli
Dist(earthq)	-0.082***	-0.053**	-0.053**	-0.073***	-0.057**	-0.131***	-0.113***	-0.110***
	(0.022)	(0.023)	(0.023)	(0.025)	(0.028)	(0.029)	(0.029)	(0.029)
Age	-0.143***	-0.054***	-0.051***	-0.104***	-0.150***	-0.138***	-0.146***	-0.151***
	(0.016)	(0.017)	(0.019)	(0.020)	(0.020)	(0.023)	(0.022)	(0.022)
Age squared	0.240***	0.163***	0.149***	0.222***	0.222***	0.142***	0.256***	0.253***
	(0.018)	(0.016)	(0.019)	(0.020)	(0.023)	(0.023)	(0.023)	(0.023)
Male dummy	-0.107***	-0.110***	-0.056***	-0.121***	-0.100***	-0.096***	-0.131***	-0.136***
	(0.004)	(0.004)	(0.008)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)
Married dummy	0.033***	0.048***	0.057***	0.049***	0.036***	0.013***	0.055***	0.050***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Absolute latitude	-0.092**	-0.051*	-0.041	-0.076***	-0.112***	0.094**	-0.066*	-0.069*
	(0.036)	(0.030)	(0.031)	(0.027)	(0.030)	(0.039)	(0.037)	(0.036)
Distance to the coast	0.040***	0.055***	0.041***	0.032***	0.049***	0.083***	0.063***	0.064***
	(0.013)	(0.013)	(0.012)	(0.012)	(0.015)	(0.016)	(0.015)	(0.015)
Earthq t	-0.009*	-0.001	0.010*	-0.008	-0.011**	-0.003	-0.005	-0.009
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.007)	(0.006)
Earthq t-1	-0.007	0.002	-0.008	-0.008	-0.014**	0.004	-0.007	-0.006
	(0.004)	(0.007)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)
Observations	198,264	192,120	196,860	126,195	129,910	120,072	103,282	104,040
R-squared	0.407	0.208	0.278	0.263	0.226	0.202	0.337	0.325
Country and year fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Dist=-.081 p-value	1	0.211	0.225	0.737	0.379	0.0940	0.273	0.319

Notes. The table replicates Panel A of Table 2 with standardized betas.

B.6 Binned scatterplots

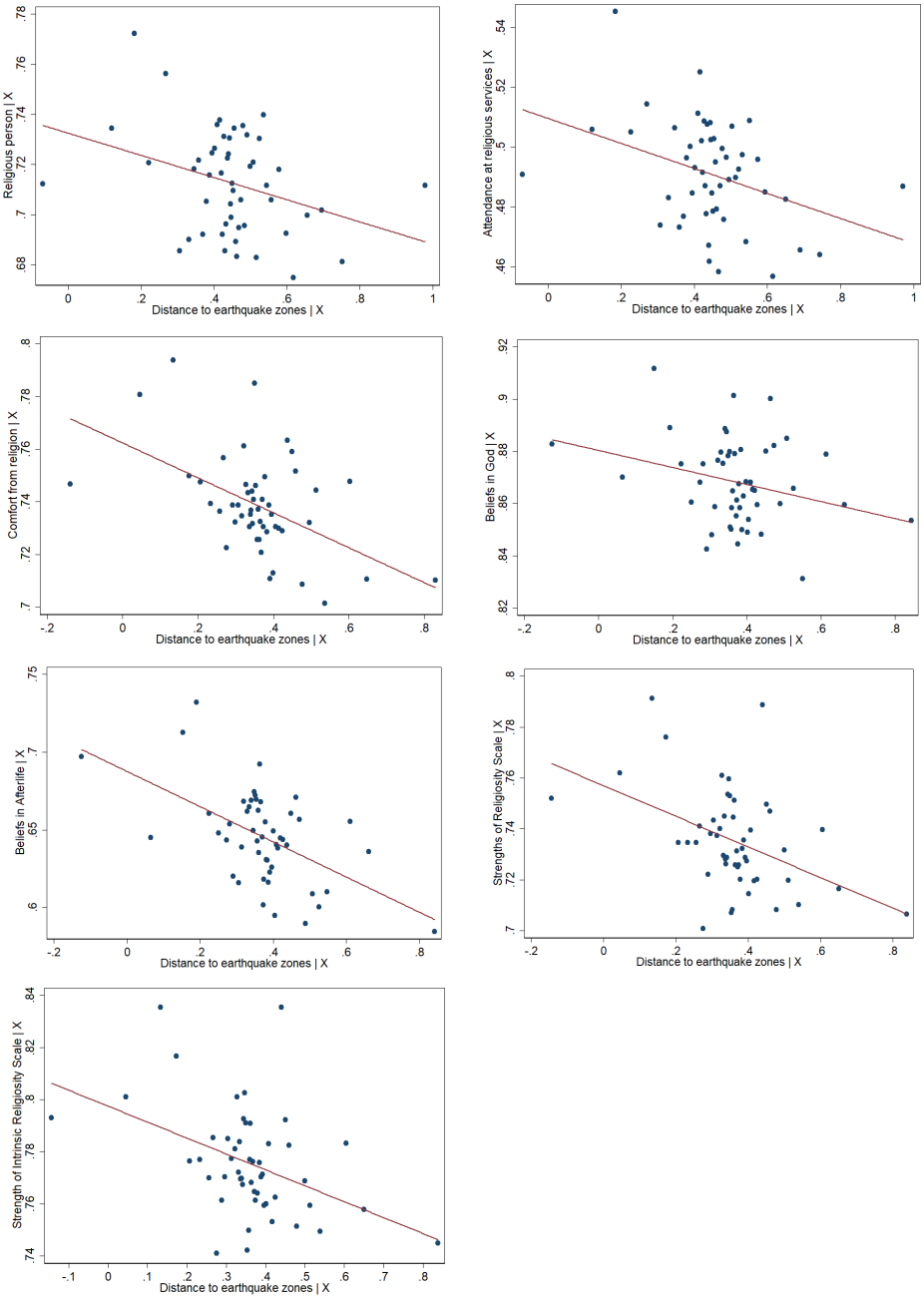


Figure A2. Binned scatterplots for remaining religiosity measures

B.7 Actual earthquakes

While the main results include controls for actual earthquakes in year t and t-1, Table A8 replicates the result of column (8) of Panel A of Table 2 controlling for additional past earthquakes. Compared to Table 2, the sample is restricted to the sample without districts hit by an earthquake in the year of interview. The pooled WVS-EVS only

provides data on the year in which the interview took place. Thus, it is not possible to tell whether an earthquake that hit in the same year, hit before or after the interview, which jeopardizes the intrepretation. Column (12) interacts long-term earthquake risk with a dummy indicating whether an earthquake hit in the year before the interview. The interaction is positive, but insignificant. However, only 24 districts in the sample were hit within the last year, so this result should be taken with caution.

Table A8. Main results accounting for actual earthquakes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep. var.: Strength of Intrinsic Religiosity Scale												
Dist(earthq), 1000km	-0.062***	-0.063***	-0.062***	-0.062***	-0.063***	-0.063***	-0.063***	-0.065***	-0.064***	-0.065***	-0.065***	-0.063***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Earthquake year t-1		-0.003	-0.006	-0.005	-0.004	-0.004	-0.002	-0.002	-0.004	-0.003	-0.006	-0.005
		(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.009)
Earthquake year t-2			0.007	0.009	0.009	0.009	0.009	0.011	0.011	0.011	0.014	
			(0.009)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)	(0.009)	
Earthquake year t-3				-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.009	
				(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	
Earthquake year t-4					-0.005	-0.005	-0.004	-0.003	-0.009	-0.013	-0.011	
					(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	
Earthquake year t-5						-0.000	0.000	-0.000	-0.001	-0.003	-0.004	
						(0.013)	(0.013)	(0.013)	(0.012)	(0.012)	(0.012)	
Earthquake year t-6							-0.005	-0.004	-0.010	-0.010	-0.011	
							(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	
Earthquake year t-7								-0.011	-0.010	-0.011	-0.010	
								(0.018)	(0.018)	(0.018)	(0.017)	
Earthquake year t-8									0.019*	0.016	0.016	
									(0.011)	(0.011)	(0.011)	
Earthquake year t-9										0.013	0.014	
										(0.010)	(0.011)	
Earthquake year t-10											-0.011	
											(0.009)	
Dist(earthq) X earthq t-1												0.080
												(0.098)
Observations	96,811	96,811	96,811	96,811	96,811	96,811	96,811	96,811	96,811	96,809	96,809	96,811
R-squared	0.321	0.321	0.321	0.321	0.321	0.321	0.321	0.321	0.321	0.321	0.321	0.321
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. The table replicates column (8) of Panel A, Table 2 on a sample restricted to districts that were not hit in the year of interview.

Table A9 shows the correlations between actual earthquakes and the two earthquake risk measures.

Table A9. Correlation matrix between earthquake measures

	Dist	Mean	Sum
Distance to earthquake zones 3 and 4	1.00		
Mean of all earthquake zones	-0.63***	1.00	
Sum of all earthquakes 1973-2014	-0.15***	0.49***	1.00

B.8 Controls

B.8.1 Main results without baseline controls

Table A10 replicates Panel A of Table 2 without controls in Panel A and with country-by-year fixed effects in Panel B. Churchgoing turns insignificant in the specification without country-by-year fixed effects. This could be either due to problems of comparability across countries or it could be in consistence with the findings in the religious coping literature that churchgoing is less affected than intrinsic religiosity.

Table A10. Main results adding controls consequtively

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	impgod	relpers	service	comfort	believe	afterlife	rel	reli
Panel A. No controls								
Dist(earthq), 1000km	-0.069***	-0.028*	-0.024	-0.123***	-0.086***	-0.077***	-0.094***	-0.099***
	(0.020)	(0.017)	(0.020)	(0.028)	(0.021)	(0.026)	(0.023)	(0.022)
R-squared	0.012	0.001	0.001	0.016	0.015	0.006	0.021	0.021
Panel B. Country-by-year fixed effects								
Dist(earthq), 1000km	-0.056***	-0.049**	-0.039**	-0.070***	-0.042**	-0.122***	-0.068***	-0.072***
	(0.015)	(0.020)	(0.015)	(0.021)	(0.018)	(0.032)	(0.017)	(0.018)
R-squared	0.383	0.182	0.263	0.230	0.207	0.185	0.304	0.292
Observations	203,100	196,721	201,254	130,139	133,948	123,744	105,947	107,022
Regions	884	880	868	611	592	592	591	591
Countries	85	84	83	67	66	66	66	66

Notes. Panel A of Table 2 without controls in Panel A and with country-by-year fixed effects in Panel B.

B.8.2 Additional controls

Panel A of Table A11 replicates Panel A of Table 2 on the restricted sample, where information on individual income is available. Panel B adds the ten income dummies (variable x047 in the WVS-EVS dataset).

Table A11. Main results including income dummies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	impgod	relpers	service	comfort	believe	afterlife	rel	reli
Panel A. Restricted sample with information on income								
Dist(earthq), 1000km	-0.046***	-0.037*	-0.029*	-0.039**	-0.020	-0.102***	-0.055***	-0.054***
	(0.014)	(0.019)	(0.015)	(0.020)	(0.016)	(0.029)	(0.014)	(0.015)
R-squared	0.415	0.212	0.275	0.255	0.223	0.220	0.312	0.308
Panel B. Including income dummies								
Dist(earthq), 1000km	-0.044***	-0.036*	-0.028*	-0.035*	-0.018	-0.100***	-0.052***	-0.051***
	(0.014)	(0.019)	(0.015)	(0.020)	(0.016)	(0.029)	(0.014)	(0.015)
R-squared	0.417	0.212	0.275	0.257	0.224	0.220	0.314	0.310
Observations	150,035	145,632	148,251	85,447	88,709	82,755	70,827	71,376
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y

Notes. Panel A replicates Panel A of Table 2, but on the restricted sample, where information on individual income is available. Panel B adds the ten income dummies (variable x047 in the WVS-EVS dataset).

Table A12 replicates column (8) of Panel A of Table 2 adding individual-level controls for trust (variable a165 from the pooled EVS-WVS), an unemployment dummy,[56] and ethnicity fixed effects (variable x051). The coefficient on long term eartquake risk stays remarkably stable throughout.

Table A13 adds the following district-level controls to the same specification: population density in year 2000, arable land shares (calculated based on irrigated and rainfed agriculture, plate 47 from the FAO GAEZ 2002 database), average temperatures 1961-1990 (spatial data from GAEZ), average precipitation and variation therein (spatial data from GAEZ), district area in square km, average district-level ruggedness (based on Nunn & Puga (2012)), average elevation, soil quality (plate 27 from the FAO GAEZ 2002 database), and a dummy equal to zero if the distance to earthquake zones 3 or 4 is equal to zero.[57] Column (11) includes all significant variables simultaneously with no change to

[56] The unemployment dummy is equal to one if the person indicated his/her unemployment status as "Unemployed", zero otherwise (variable x028 in the pooled WVS-EVS).

[57] In line with the work by Ager & Ciccone (forthcoming), the results show that increased within-year variation in precipitation increases religiosity.

the results. The estimate on earthquake risk stays remarkably constant throughout. The largest reduction in the estimate on earthquake risk is caused by including ruggedness, which reduce $\hat{\beta}$ from 0.063 to 0.055. Were any omitted variable to explain $\hat{\beta}$ entirely, its inclusion should result in an eight times larger reduction in $\hat{\beta}$ compared to the reduction caused by ruggedness (Altonji *et al.* (2005)).

Table A12. Main results including additional individual level controls

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Strength of Intrinsic Religiosity					
Dist(earthq), 1000km	-0.063***	-0.064***	-0.063***	-0.053***	-0.057***
	(0.016)	(0.016)	(0.016)	(0.014)	(0.018)
Trust		0.001			
		(0.003)			
Unemployed dummy			0.002		
			(0.004)		
Agricultural worker				0.025***	
				(0.004)	
Observations	104,040	100,371	101,045	76,464	61,340
R-squared	0.325	0.325	0.330	0.311	0.330
Baseline controls	Y	Y	Y	Y	Y
116 ethnicity FE	N	N	N	N	Y
Regions	591	591	586	475	375

Notes. The table replicates column (8) of Panel A of Table 2 including additional control variables.

Table A13. Main results including additional geographic controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dependent variable: Strength of Intrinsic Religiosity											
Dist(earthq), 1000km	-0.063***	-0.063***	-0.063***	-0.063***	-0.061***	-0.060***	-0.055***	-0.064***	-0.060***	-0.067***	-0.054***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)	(0.016)	(0.016)	(0.017)	(0.017)
Popdens 2000	-0.003**										-0.002*
	(0.001)										(0.001)
Arable land (%)		-0.003									
		(0.010)									
Avg temp 1961-90			0.001								
			(0.001)								
Prec 1961-90				0.016							
				(0.010)							
Var(prec) 1961-90					0.134***						0.105**
					(0.048)						(0.046)
Area 1000km						-0.000					
						(0.000)					
Average ruggedness							0.091***				0.073**
							(0.027)				(0.029)
Average elevation								0.014*			0.001
								(0.008)			(0.008)
Soil quality									0.023		
									(0.018)		
Disaster>0										0.012	
										(0.010)	
Observations	103,489	104,040	103,365	103,365	102,434	104,040	101,484	101,907	103,284	104,040	100,768
R-squared	0.325	0.325	0.325	0.325	0.326	0.326	0.319	0.318	0.325	0.325	0.319
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Regions	590	591	589	589	583	591	574	577	588	591	572
Ethnicity FE											N

Notes. The table replicates column (8) of Panel A of Table 2 including additional control variables.

Table A14 replicates column (8) of Panel A of Table 2 including all eleven answers from one particular question in the pooled WVS-EVS. The question sounds: Here is a list of qualities that a child can be encouraged to learn at home. Which, if

any, do you consider to be especially important? Please choose up to five.[58] The list of qualities includes: Manners (column 1), independence (column 2), hard work (3), feeling of responsibility (4), imagination (5), tolerance and respect for other people (6), thrift saving money and things (7), determination and perseverance (8), religious faith (9), unselfishness (10), and obedience (11).

Table A14. Adding alternative values as controls and dependent variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Alternative value:	Manners	Independence	Work	Responsibility	Imagination	Respect	Thrift	Perseverence	Faith	Unselfish	Obedience
Dependent variable: Strength of Intrinsic Religiosity Scale											
Dist(earthq), 1000km	-0.073***	-0.072***	-0.074***	-0.075***	-0.072***	-0.074***	-0.074***	-0.074***	-0.064***	-0.074***	-0.073***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)	(0.019)
Alternative value	0.030***	-0.052***	-0.004	-0.019***	-0.047***	0.002	-0.011***	-0.041***	0.181***	-0.008**	0.024***
	(0.004)	(0.004)	(0.003)	(0.003)	(0.005)	(0.003)	(0.004)	(0.003)	(0.009)	(0.004)	(0.003)
R-squared	0.312	0.317	0.311	0.312	0.314	0.311	0.311	0.314	0.364	0.311	0.312
Observations	69,857	69,857	69,857	69,857	69,857	69,857	69,857	69,857	69,857	69,857	69,857

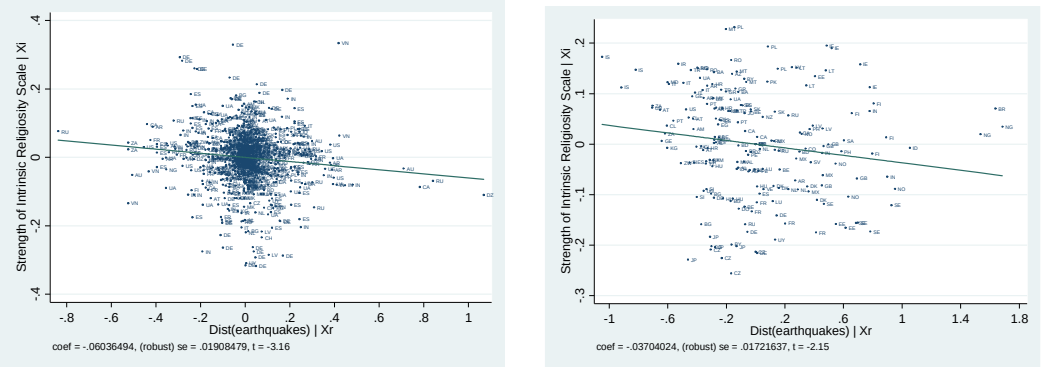
Notes. OLS estimates. The table replicates column (8) of Panel A of Table 2.

[58] Respondents that answered yes to more than five of the values were removed.

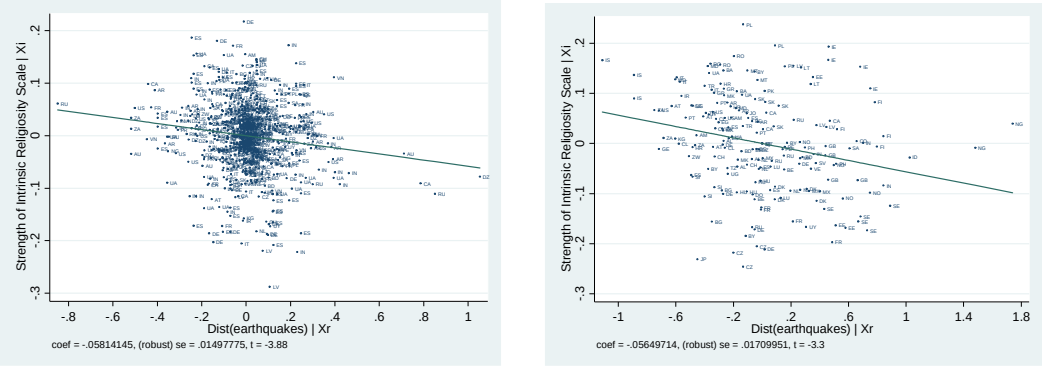
B.9 Aggregation at the district and country level

The district-level aggregation is done in the following way: $religiosity_{dct} = \frac{1}{N}\sum_{i=1}^{N} w_{idct} \cdot \widehat{religiosity}_{idct}$, where the weights, w_{idct}, are based on variable s017 used throughout. $\widehat{religiosity}_{idct}$ measures the residuals of a regression of $religiosity_{idct}$ on the particular individual-level controls for age, age squared, married, and male. Panel A of Table 2 has 591 districts and 75 countries. In addtion to the controls included in Panel A of Table 2, the country-level aggregates also include a dummy for whether the country is communist together with continent fixed effects. Excluding these additional control variables leaves the parameter estimate on earthquake risk and the level of significance unchanged (-0.032 (se 0.017)).

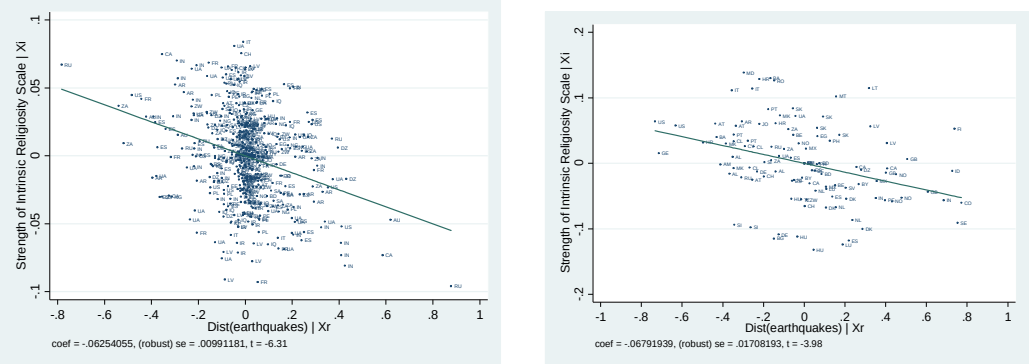
Panel A. Full sample



Panel B. Excluding outliers (diff<=1)



Panel C. Excluding outliers (diff<=0.1)



District aggregates Country aggregates

Figure A3. Added variable plots of religiosity on long-term earthquake risk

Notes. AV-plots of OLS estimation across district aggregates in the left panels and across country aggregates in the right. The estimation corresponds to that in column (8) of Panel A in Table 2, where the individual-level controls are accounted for before aggregation. Panel A includes the full sample, Panel B excludes outliers based on Cooks D > 1, and Panel C excludes outliers based on Cooks D > 0.1. Labels: Country ISO codes.

B.9.1 Further investigation of country weights

Table A15 shows results aggregated to the country-level, using country weights (variable s017) in Panel A, and aggregating without country weights in Panel B.

Table A15. Main results aggregated to the country level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep.var.	impgod	rel_pers	service	comfort	believe	after	reli
Panel A. Baseline							
Dist(earthq)	-0.053***	-0.048***	-0.003	-0.045***	-0.055***	0.001	-0.037**
	(0.012)	(0.013)	(0.012)	(0.017)	(0.015)	(0.019)	(0.018)
Observations	320	320	318	204	252	202	196
R-squared	0.643	0.425	0.611	0.539	0.493	0.414	0.462
Panel B. Baseline without weights							
Dist(earthq)	-0.054***	-0.049***	-0.003	-0.045***	-0.056***	0.001	-0.037**
	(0.012)	(0.013)	(0.012)	(0.017)	(0.015)	(0.019)	(0.018)
Observations	320	320	318	204	252	202	196
R-squared	0.643	0.424	0.610	0.539	0.492	0.413	0.462
Baseline controls	Y	Y	Y	Y	Y	Y	Y

B.10 Actual losses from earthquakes

An alternative measure of the impact from an earthquake is the costs of the disaster. The International Disaster Database EM-DAT provides information at the country-level of all newer disasters of a certain impact and size. It also provides information on the costs of the disasters, both human (number of injured, number of deaths) and economical. Data was downloaded at www.emdat.be. The database is created from information from various sources, ranging from UN agencies to press agencies. Most prioritized is the information from UN agencies, governments and the International Federation of Red Cross.

I have divided the human and economic costs of the disasters with the population in each country. Table A16 shows the correlation between a dummy equal to one if the country is located within a high-risk earthquake zone, zero otherwise, the distance-based and the mean-based measures of earthquake risk and the three actual costs of earthquakes. Countries located within high risk earthquake zones experience more human and economic costs from earthquakes. Likewise for the mean-based measure. The distance-based measure does not correlate significantly with any of the costs. This indicates that the results using the distance-based measure are not likely to be driven by the actual costs of earthquakes.

Table A16. Correlations between actual losses and different risk measures

	Eq zone dummy	Dist(earthq)	Mean(earthq)	Deaths	Affected	Damage
Earthquake zone dummy	1.00					
Dist(earthquake zones)	-0.54***	1.00				
Mean(earthquake zones)	0.72***	-0.48***	1.00			
Deaths per capita	0.13*	-0.07	0.16**	1.00		
Affected per capita	0.22***	-0.12	0.30***	0.51***	1.00	
Damage per capita	0.15**	-0.08	0.28***	0.15**	0.32***	1.00

Table A17 investigates the relationship between the intristic religiosity scale and the human and economic cost of earthquakes from the EM-DAT database. There is a positive relationship between religiosity and human costs from disasters, also when controlling for GDP per capita (Panel A). The relation seems to be driven mainly by differences across continents, though (Panel B). There seems to be no relation between the economic costs from earthquakes and religiosity. If anything, economic damage reduces religiosity, but this effect becomes insignificant once GDP per capita is included.

Table A17. OLS of religiosity on actual losses from earthquakes across countries

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Strength of Intrinsic Religiosity Scale						
Panel A. Including baseline individual level controls						
Deaths per capita	0.785***			0.562***		
	(0.212)			(0.158)		
Affected people per capita		0.006***			0.004***	
		(0.002)			(0.001)	
Total damage per capita			-0.000			-0.000
			(0.000)			(0.000)
GDP per capita PPP 2010				-0.006***	-0.005***	-0.006***
				(0.001)	(0.001)	(0.001)
Observations	208	208	208	205	205	205
R-squared	0.011	0.039	0.006	0.191	0.202	0.186
Panel B. Including individual level controls and continent and year fixed effects						
Deaths per capita	0.380			0.423		
	(0.476)			(0.453)		
Affected people per capita		0.004*			0.003*	
		(0.002)			(0.002)	
Total damage per capita			-0.000*			-0.000
			(0.000)			(0.000)
GDP per capita PPP 2010				-0.005***	-0.004***	-0.004***
				(0.001)	(0.001)	(0.001)
Observations	203	203	203	200	200	200
R-squared	0.331	0.341	0.340	0.408	0.414	0.408

Notes. The individual level controls are the same as those included throughout. They are accounted for before aggregating the data.

B.11 Different religiosity measures

The original variables used in Table 1 are: (1): f063, (2): f064, (3): f050, (4): f034, (5): f051, and (6): f028. The original variable f034 (religious person) also had a category for convinced atheists. Following Inglehart & Norris (2003), I group people who rank themselves as not religious or atheist into one category, as there are very few respondents in the latter group. The variables f063 (importance of god) and f028 (churchgoing) are described and investigated further below.

B.11.1 Different categorizations of the religiosity measures

Two of the religiosity measures are not dummy measures: Attendance at religious service and importance of God. This section shows that the results for importance of God are robust to different categorizations, while attendance is not. The impact of earthquake risk occurs at the intensive margin and not at the extensive margin for both measures.

Table A18 replicates column (3) of Panel A of Table 2 with different measures of

attendance at religious services. The different columns perform different aggregations of the variable f028 from the WVS-EVS. The variable is based on the question: "How often do you attend religious services?" The possible answers are "More than once a week" (1), "Once a week" (2), "once a month" (3), "only on special holy days/Christmas/Easter" (4), "other specific holy days" (5), "once a year" (6), "less often" (7), "never, practically never" (8). The orginal variable takes on values from 1 to 8. All permutations of this variable depicted in Table A18 are rescaled to lie between 0 and 1 and are flipped around so larger values mean more churchgoing. Column (1) uses variable f28 directly. Column (2) replicates column (3) of Panel A of Table 2, where categories (4) and (5) are aggregated, due to few observations in the latter and since it is not obvious how to rank the two. Columns (3) and (4) investigate the impact of earthquake risk on dummies indicating frequent churchgoers, defined as attending religious services more than weekly (category 1) in column (3) and weekly (category 1 and 2) in column (4). Column (5) reduces the measure to the extensive margin using a dummy measuring churchgoing or not. "Not" is defined as "Never, practically never" (category 8). Column (6) investigates the intensive margin, where those who never or practically never are removed from the sample.

Table A18. Main results with different categorizations of churchgoing

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var: Attendance at religious services						
Dist(earthq), 1000km	-0.037**	-0.035**	-0.044***	-0.024	-0.017	-0.043***
	(0.016)	(0.015)	(0.017)	(0.019)	(0.016)	(0.016)
Observations	196,860	196,860	196,860	196,860	196,860	152,476
R-squared	0.268	0.278	0.202	0.251	0.195	0.227
Baseline controls	Y	Y	Y	Y	Y	Y
Service measure	org	base	frequent1	frequent2	extensive	intensive
Standardized coef: Dist(earthq), 1000km	-0.055**	-0.053**	-0.071***	-0.028	-0.022	-0.073***
	(0.023)	(0.023)	(0.027)	(0.022)	(0.021)	(0.027)

Notes. OLS estimates. The table replicates column (3) of Panel A of Table 2 with different measures of attendance at religious services. The individual measures are described above the table

The measure of importance of God is based on the question "How important is God in your life?", where individuals can answer a number between 1 and 10. 1 indicates "Not at all important" and 10 indicates "Very important". I have rescaled the variable to lie between 0 and 1. In table A19, column (1) replicates the baseline result in column (1) of Panel A of Table 2. Columns (2) and (3) aggregate the variable to a dummy variable measuring the difference between regarding God as important and the rest. "Important" is defined as rating God as very important (category 10) in column (2) and categories 10 and 9 in column (3). Column (4) investigates the extensive margin by using a dummy

variable measuring whether the individual is religious or not. Non-religious is defined as rating God as being not at all important (category 1). Column (5) restricts the sample to the intensive margin, by excluding individuals who answer that God is not important at all.

Table A19. Main results with different categorizations of importance of God

	(1)	(2)	(3)	(4)	(5)
Dep. var: Importance of God					
Dist(earthq), 1000km	-0.052***	-0.074***	-0.074***	-0.025*	-0.046***
	(0.014)	(0.020)	(0.023)	(0.013)	(0.013)
Observations	198,264	198,264	198,264	198,264	180,273
R-squared	0.407	0.390	0.394	0.160	0.356
Baseline controls	Y	Y	Y	Y	Y
Importance of God measure	org	frequent1	frequent2	extensive	intensive
Standardized coef: Dist(earthq), 1000km	-0.082***	-0.081***	-0.081***	-0.047*	-0.084***
	(0.022)	(0.022)	(0.025)	(0.024)	(0.023)

Notes. OLS estimates. The table replicates column (1) of Panel A of Table 2 with different measures of importance of God. The individual measures are described above the table

B.11.2 Religiosity independent of churchgoing

This section exploits answers to the question "How often do you pray to God outside religious services?"[59] The respondents can answer "Every day", "more than once a week", "once a week", "at least once a month", "several times a year", "less often", and "never". I rescaled the variable to lie between 0 (never) and 1 (every day). One issue with the measure is that people who go to church more often may be less likely to pray when they are not in church. Since earthquake risk also influences churchgoing, this may affect the results. Column (3) shows that earthquake risk increases the degree of prayer outside religious services, but less so for those who go to church more often. These results are consistent with religious coping and cannot be explained by alternative theories that involve churchgoing. The variable measuring attendance at religious services takes the values 0 to 1, where 1 indicates those who attend religious services more than once a week. This variable is not available for enough observations to estimate the corresponding regression in the event study.

[59] Thanks to an anonymous referee for suggesting to use this question.

Table A20. Main results with prayer outside religious services as alternative measure of religiosity

	(1)	(2)	(3)
Dependent variable: Prayer outside religious services			
Dist(earthquake zones), 1000km	-0.103**	-0.025	-0.101***
	(0.044)	(0.029)	(0.030)
Dist(earthquake zones) x attendance at religious services			0.246***
			(0.040)
Attendance at religious services			0.469***
			(0.027)
Observations	66,192	66,192	64,058
R-squared	0.166	0.327	0.506
Baseline controls	Y	Y	Y
Country-by-year FE	N	Y	Y

B.12 Heterogeneity by religion and continents

To investigate whether people from different denominations engage differently in religious coping, the following equation is estimated:

$$religiosity_{idct} = \alpha + \beta_1 disasters_{dc} + \beta_2 disasters_{dc} \cdot I^g_{idct} + \beta_3 I^g_{idct} + \gamma_{ct} + X'_{dc}\eta + W'_{idct}\delta + \varepsilon_{idct} \quad (1)$$

where I^g are dummy variables equal to one if individual i belonged to the religious denomination g at time t. g refers to one of the major religions: Christianity (split into Catholicism and Protestantism), Islam, Buddhism, Hinduism, Judaism, and Other religions.[60] $\beta_1 + \beta_2$ is the impact of earthquake frequency for individuals belonging to religion g.

Table A21 shows estimation results for equation (1). Column (1) includes no interaction effects, but restricts the sample to the sample where information on individuals' religious denomination is available. The estimate drops in absolute value from -0.063 (column 8, Panel A, Table 2) to -0.043 on this restricted sample. This is probably because we are now comparing people with more similar levels of religiosity. Panel A of the table includes the baseline controls (individual-level controls and geographic controls).

Column (2) of Panel A shows that on average, Christians do not respond differently than the rest to increased earthquake risk, but splitting Christians into Catholics and Protestants (col 3 and 5) reveals that Catholics react less than average, while Protestants react no different than the average person in the sample. Column (4) shows that Catholics do not react different than Protestants. Columns (6), (7), (8) and (10) show that neither

[60] The major religions are based on answers to the question "Which religious denomination do you belong to?" (question f025). There are 84 different answers, which are grouped into the major religions and "Other". The latter covers mainly religious denominations reported as "Other" (83%) and Ancestral worshipping (9%). The latter covers 215 individuals from seven districts in Vietnam.

Muslims, Hindus, Jews nor the Other category react differently than average. Note, however, that there are only 405 individuals that identify as Jews in this sample. Column (9) shows that Buddhists tend to respond less to earthquake risk than the rest, leaving the composite effect for Buddhists insignificant (p-value 0.273). But note that Buddhists are very poorly represented in the sample with only 817 individuals categorising themselves as Buddhists.To increase the sample size in an attempt to be able to draw conclusions for the religious denominations with few followers, Panel B excludes the individual-level controls. There are 426 individuals who identify as Jews in this sample and 1,007 who identify as Buddhists. The correlation between disaster risk and religiosity continues to be significantly smaller for Buddhists than the rest. The Muslisms seem to engage more in religious coping than the rest at the 10% significance level, but this is due to the exclusion of the individual controls: The interaction term between Muslim and disaster risk becomes significant at the 10% level when excluding the individual-level controls, but restricting to the sample in Panel A.

The finding that Catholics respond more to earthquakes than the rest of the world is consistent with the idea from the religious coping literature that those with more coping alternatives use religion less in coping. One major alternative mentioned is social networks. Catholicism is a relatively community-based religion, while for instance Calvin's doctrine of salvation is based on the principle of "faith alone" (Weber (1930)). This gives Catholics an additional coping alternative to intensified believing, namely their social networks. Note, however, that the comparison group is not just Protestants, but also the remaining religions, which can have more or less social networks. When restricting the sample to Christians, the sign on the interaction with Catholics remains positive, but is no longer significant (not shown).

Table A21. Main results across religious denominations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dep. var.: Strength of Intrinsic Religiosity Scale										
Denomination		Christ	Cath	Cath	Prot	Musl	Hindu	Budd	Jew	Other
Panel A. Including baseline controls										
Dist(earthq), 1000 km	-0.043***	-0.054***	-0.056***	-0.047***	-0.038**	-0.039***	-0.037***	-0.044***	-0.044***	-0.044***
	(0.014)	(0.018)	(0.015)	(0.014)	(0.015)	(0.014)	(0.012)	(0.014)	(0.014)	(0.015)
Dist(earthq) X Denomination		0.017	0.030**	0.016	-0.017	-0.018	-0.038	0.105*	0.025	0.011
		(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.046)	(0.055)	(0.046)	(0.016)
Observations	85,423	85,423	85,423	53,529	85,423	85,423	85,423	85,423	85,423	85,423
R-squared	0.237	0.238	0.237	0.215	0.237	0.240	0.237	0.237	0.237	0.237
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Districts	580	580	580	515	580	580	580	580	580	580
Districts in group		528	505	505	341	264	60	88	76	270
Panel B. Excluding individual-level controls										
Dist(earthq), 1000 km	-0.048***	-0.058***	-0.058***	-0.051***	-0.044***	-0.044***	-0.042***	-0.049***	-0.048***	-0.048***
	(0.014)	(0.017)	(0.015)	(0.014)	(0.015)	(0.014)	(0.012)	(0.014)	(0.014)	(0.014)
Dist(earthq) X Denomination		0.016	0.024**	0.010	-0.012	-0.019*	-0.035	0.119**	0.014	0.011
		(0.012)	(0.011)	(0.012)	(0.011)	(0.011)	(0.045)	(0.058)	(0.043)	(0.015)
Observations	88,056	88,056	88,056	55,847	88,056	88,056	88,056	88,056	88,056	88,056
R-squared	0.214	0.215	0.215	0.181	0.215	0.217	0.214	0.215	0.215	0.214
Geo controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Districts	580	580	580	515	580	580	580	580	580	580
Districts in group		528	506	506	341	265	62	89	76	270
Sample	Full	Full	Full	Prot_Cath	Full	Full	Full	Full	Full	Full

Notes. The table replicates column (8) of Panel A of Table 2, including interaction terms between earthquake risk and the major religious denominations All columns include both variables in the interaction term separately.

Table A22 investigates the robustness of the results to including the original variable measuring religious denominations (f025) as 59 fixed effects (column 2) and including fixed effects of the six major religions shown in Table A21 (column 3). The estimate on earthquake risk is unchanged. A literature has emphasized the importance of so-called "big gods" for the evolution of large-scale cooperation (e.g., Norenzayan & Shariff (2008)). Perhaps these religions provide a better coping tool than others. Unfortunately, there are not many respondents in the dataset that confess beliefs in religions without big gods. Only 224 respondents from seven districts directly state that they follow an indigenous religion without a big god (ancestor worshipping). The rest of the respondents belong to a religion with a big god or have stateed that they belong to an "other" religion than those suggested in the survey. As all the large religions with big gods are already listed, respondents that identify with "other" are very likely to belong to a religion without a big god. I have recoded the data as such, which increases the number of adherents to a religion without a big god to 2,268. Column (4) shows that adherents to religions with big gods do not respond to earthquake risk any different than the rest. Column (5) includes an interaction with monotheism, which encompasses the same religions as those with big gods, except that Hinduism is not a monotheistic religion, but is defined as a religion with big gods.

Table A22. Main results with additional denominational controls and interactions

	(1)	(2)	(3)	(4)	(5)
Dep. var.: Strength of Intrinsic Religiosity Scale					
Dist(earthquakes), 1000 km	-0.043***	-0.045***	-0.040***	-0.038**	-0.038*
	(0.014)	(0.014)	(0.015)	(0.019)	(0.022)
Dist(earthquakes) x big gods dummy				-0.006	
				(0.016)	
Dist(earthquakes) x monotheism					-0.007
					(0.017)
Observations	85,423	85,411	85,423	85,423	85,423
R-squared	0.237	0.250	0.241	0.237	0.237
Baseline controls	Y	Y	Y	Y	Y
59 denomination FE	N	Y	N	N	N
6 major denomination FE	N	N	Y	N	N

B.12.1 Continents

Table A23 allows the impact of distance to earthquakes to vary across continents by including the interaction term $disaster \cdot I_g$, where I_g is a dummy variable equal to one if the individual lives on that particular continent. The impact of distance to earthquake zones does not vary across continents.

Table A23. Main results across continents

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.: Strength of Intrinsic Religiosity Scale						
Dist(earthquakes), 1000 km	-0.063***	-0.067***	-0.046***	-0.066***	-0.069***	-0.067***
	(0.016)	(0.021)	(0.016)	(0.018)	(0.019)	(0.017)
Dist(earthquakes) X America		0.016				
		(0.032)				
Dist(earthquakes) X Europe			-0.062			
			(0.044)			
Dist(earthquakes) X Asia				0.011		
				(0.049)		
Dist(earthquakes) X Africa					0.031	
					(0.029)	
Dist(earthquakes) X Oceania						0.051
						(0.048)
Observations	104,040	104,040	104,040	104,040	104,040	104,040
R-squared	0.325	0.325	0.326	0.325	0.325	0.325
Baseline controls	Y	Y	Y	Y	Y	Y
Districts	591	591	591	591	591	591
Districts in group		97	287	145	53	9

Notes. The table replicates column (8) of Panel A of Table 2, including interaction terms between earthquake risk and continents. All columns include both variables in the interaction term separately.

B.13 Additional disasters

The data on tropical storm intensity zones are based on the probability of occurrence of storms falling within five wind speed categories of the Saffir-Simpson Hurricane Scale.[61] The five wind speed categories are: 1) 118-153 km/h, 2) 154-177 km/h, 3) 178-209 km/h, 4) 210-249 km/h, and 5) 250+ km/h. The Storm Intensity Zone layer shows areas where each of these wind speed categories has a 10% probability of occurring within the next 10 years. For each district, the distance to storm intensity zones 2 or above is calculated. Storm intensity zones 2 or above are depicted in Figure A4 below as the dark blue areas.

The data on volcanic eruption intensity zones measure the density of volcanic eruptions based on the explosivity index for each eruption and the time period of the eruption. Eruption information is spread to 100 km beyond point source to indicate areas that could be affected by volcanic emissions or ground shaking. The source of the data is worldwide historical volcanic eruptions occurring within the last 10,000 years (to 2002) from Siebert & Simkin (2002).[62] The volcanic eruptions were rated using the Volcanic Explosivity Index (VEI), which is a simple 0-to-6 index of increasing explosivity, with each successive integer representing about an order of magnitude increase. For each district,

[61] Available online at U.S. Geological Survey: http://www.usgs.gov/.

[62] The data were digitalized by the Smithsonian Institution's Global Volcanism Program, http://www.volcano.si.edu/index.cfm.

the distance to volcanic eruption risk zones 2 or above is calculated. These zones are depicted by the orange areas in Figure A4.

Similar zone data for tsunamis do not exist. Instead, the tsunami measure is simply the distance from each district to the nearest tsunami ever recorded. The data on tsunami events is from the Global Historical Tsunami Database from the National Geophysical Data Center (NOAA). The events since 2000 BC were gathered from scientific and scholarly sources, regional and worldwide catalogues, tide gauge reports, individual event reports, and unpublished works. The tsunamis are depicted as the triangles in Figure A4.

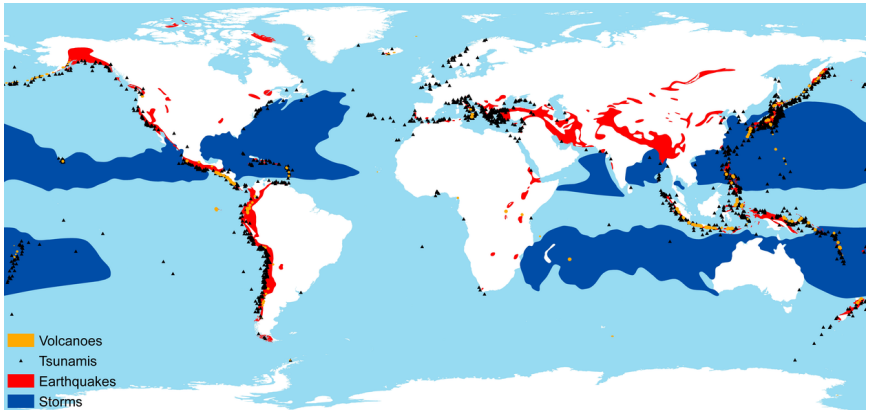
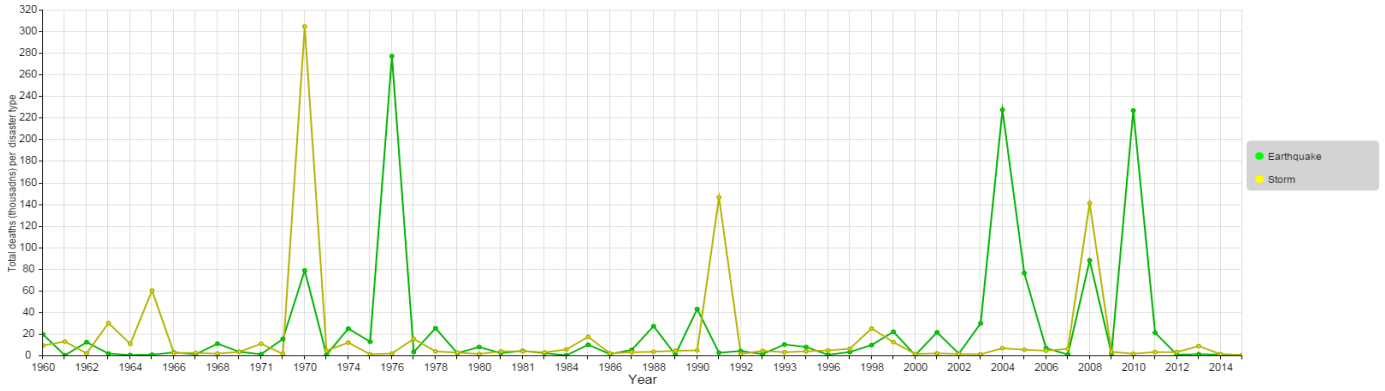
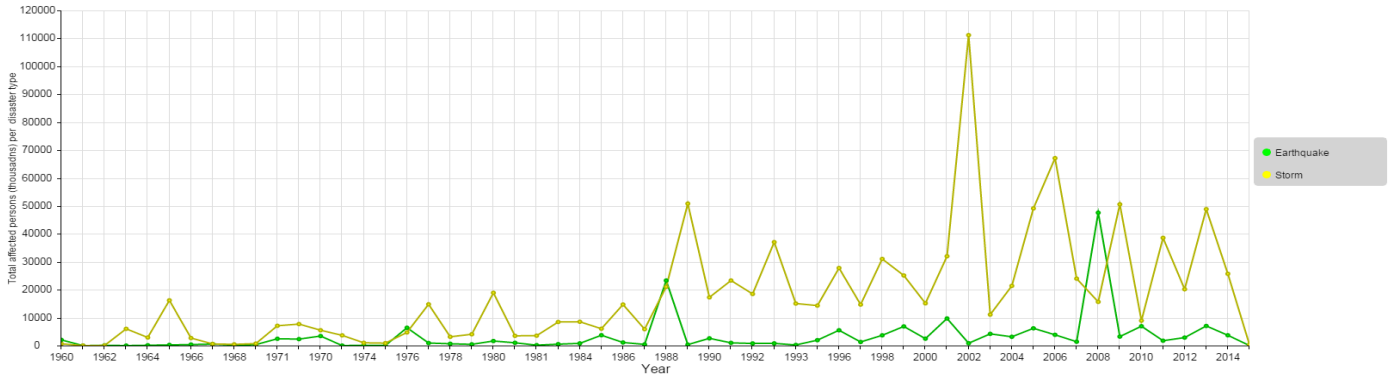


Figure A4. Disaster zones.

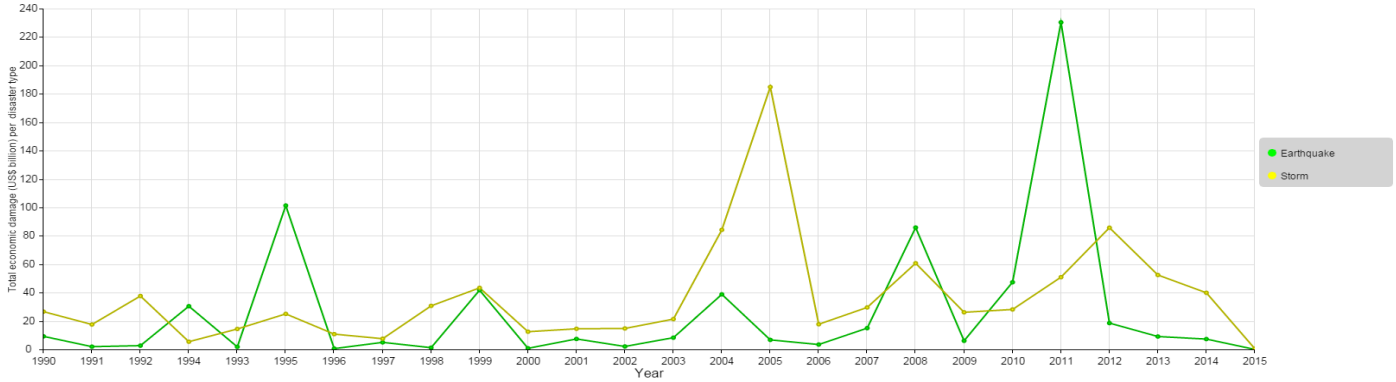
B.14 Severity of earthquakes vs storms



Panel A. Deaths from storms and earthquakes



Panel B. People affected by storms and earthquakes



Panel C. Economic damage by storms and earthquakes

Figure A5. Damage by storms and earthquakes

Notes: Yellow lines represent storms, green is earthquakes. Source: Data from Emdat (int.nat disaster database), 1960-2014.

B.15 Heterogeneity by development

Table A24 replicates column (8) of Panel A in Table 2, checking whether the effect of earthquake risk differs across individuals' level of income or education and whether the respondent works as an agricultural worker or is unemployed. The two latter variables are based on variables x036 and x028. Columns (1), (3), (5) and (7) add interactions between earthquake risk and individual income, education, status as agricultural worker, and employment status. Columns (2) and (4) add interactions with the individual deciles of the income measure and the different categories of education. The impact of earthquake risk does not vary systematically within different income or education levels.

Earthquake risk does increase religiosity significantly more for the unemployed (column 7), even controlling for the ten income fixed effects (column 8). The literature on religious coping finds both dampening effects of income (e.g., Gurin *et al.* (1960)) and no effects (e.g., Carl Pieper *et al.* (1992)). On the other hand, the literature on religious coping agrees that individuals with fewer coping alternatives in general should be more inclined to use religion for coping. One major alternative is social networks to turn to in times of need (e.g., Pargament (2001)). Thus, the finding that unemployed individuals respond more to earthquakes with increased believing, even conditioning on income, is consistent with the religious coping literature.

Table A25 aggregates the same development measures up to the district level and include the corresponding interactions with district-level development, controlling for individual level income in odd columns. Two additional measures that are only available at the district-level are added: Light density at night and population density. Columns (13) and (14) include an interaction between earthquake risk and the size of the district area that the individual was interviewed in. This is meant as a test of selection in the cross-section analysis; if the results were driven by atheists moving out of high-risk areas, this effect should be larger for smaller districts, where moving is more likely to mean moving out of the district. If anything, the opposite seems to be the case; earthquake risk increases religiosity slightly more for larger districts.

Table A24. Main results with interactions with individual level development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable: Strength of Intrinsic Religiosity Scale								
Measure of development	Inc	Inc	Edu	Edu	Agri	Agri	Unempl	Unempl
Dist(earthq), 1000km	-0.048***		-0.061***		-0.053***	-0.046***	-0.059***	-0.048***
	(0.017)		(0.018)		(0.014)	(0.014)	(0.016)	(0.015)
Dist(earthq) x development	-0.001		-0.001		-0.002	-0.002	-0.036***	-0.026***
	(0.002)		(0.001)		(0.011)	(0.011)	(0.008)	(0.007)
Dist(earthq) x dev1		-0.053***		-0.053***				
		(0.016)		(0.018)				
Dist(earthq) x dev2		-0.042**		-0.055***				
		(0.016)		(0.018)				
Dist(earthq) x dev3		-0.052***		-0.051***				
		(0.015)		(0.018)				
Dist(earthq) x dev4		-0.056***		-0.077***				
		(0.016)		(0.018)				
Dist(earthq) x dev5		-0.054***		-0.073***				
		(0.017)		(0.021)				
Dist(earthq) x dev6		-0.047***		-0.072***				
		(0.016)		(0.017)				
Dist(earthq) x dev7		-0.053***		-0.051***				
		(0.017)		(0.018)				
Dist(earthq) x dev8		-0.038**		-0.068***				
		(0.016)		(0.018)				
Dist(earthq) x dev9		-0.071***						
		(0.022)						
Dist(earthq) x dev10		-0.059***						
		(0.023)						
Observations	71,376	71,376	98,278	98,278	76,464	67,589	101,045	68,569
R-squared	0.310	0.310	0.329	0.330	0.311	0.310	0.330	0.317
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y
Development	Inc	Inc	Edu	Edu	Agri	Agri	Unempl	Unempl
Income FE	N	N	N	N	N	Y	N	Y

Notes. The table replicates column (8) of Panel A of Table 2, allowing for interactions with development. dev1 refers to income decile 1 or educational level 1 (inadequately completed elementary education), dev2 refers to income decile 2 or educational level 2 (completed compulsory elementary education), dev3 refers to income decile 3 or educational level 3 (incomplete secondary school, technical), dev4 refers to income decile 4 or educational level 4 (complete secondary school, technical), dev5 refers to income decile 5 or educational level 5 (incomplete secondary school, university), dev6 refers to income decile 6 or educational level 6 (complete secondary school, university), dev7 refers to income decile 7 or educational level 7 (some university without degree), dev8 refers to income decile 8 or educational level 8 (university with degree), dev9 and dev10 are the last income deciles. Both variables in interaction terms are included separately.

Table A25. Main results with interactions with district level development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Dependent variable: Strength of Intrinsic Religiosity Scale														
Dist(earthq), 1000km	-0.079***	-0.077***	0.008	-0.031	-0.059***	-0.053***	-0.049***	-0.041**	-0.063***	-0.052***	-0.064***	-0.053***	-0.057***	-0.047***
	(0.021)	(0.022)	(0.048)	(0.042)	(0.015)	(0.015)	(0.018)	(0.016)	(0.016)	(0.015)	(0.017)	(0.015)	(0.017)	(0.016)
Dist(earthq) x dev	0.006	0.006	-0.015	-0.005	0.051	0.058	-0.167**	-0.113*	-18.654	8.994	0.003	0.003	-0.029*	-0.014
	(0.005)	(0.005)	(0.009)	(0.008)	(0.097)	(0.101)	(0.083)	(0.063)	(51.768)	(47.705)	(0.003)	(0.003)	(0.018)	(0.017)
Observations	78,895	71,376	98,879	66,806	80,956	71,376	101,935	69,349	103,284	70,946	103,489	71,101	104,040	71,376
R-squared	0.309	0.310	0.328	0.308	0.311	0.310	0.331	0.318	0.325	0.310	0.325	0.310	0.326	0.310
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Development	Inc	Inc	Edu	Edu	Agri	Agri	Unempl	Unempl	Light	Light	Pdens	Pdens	Area	Area
Individual income FE	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y

Notes. The table replicates Table A24, where the development measures are aggregated to the district level, adding also two development measures that are only available at the district level. Columns (13) and (14) also add an interaction with district area.

B.16 Google searches on religion

An alternative measure of religiosity that is not based on surveys is Google searches for religious terms. Google trends provides data on the share of total Google searches on specified search terms for various geographic units. These data are comparable across societies where the entire population have access to the internet. This is close to being the case for current US states. Table A26 below shows the relation between earthquake risk, defined throughout Section 3, and the frequency of various searches on religious terms as a share of total Google searches per US state. The particular search terms are "God", "church", "Jesus", "Bible", and "pray". A simple search on some of these search terms includes searches that have nothing to do with religion. For instance "God of war" is a computer game, Justin Beaber has a song called "Pray", and "Eat, Pray, Love" is a romantic comedy. I remove these from the searches.

Table A26. OLS of google searches on religious terms on earthquake risk across US states

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep. var.: Google searches of religious terms as a share of total google searches									
Search term	god	god	god	god	god	church	bible	jesus	pray
Dist(earthq), 1000 km	-0.022	-0.217***	-0.218***	-0.215***	-0.180***	-0.104	-0.248***	-0.159***	-0.179**
	(0.073)	(0.068)	(0.068)	(0.068)	(0.060)	(0.082)	(0.083)	(0.056)	(0.065)
Dist(ocean), 1000 km			0.030	0.033	0.025	0.101**	0.058	0.027	-0.040
			(0.029)	(0.033)	(0.033)	(0.041)	(0.050)	(0.025)	(0.044)
Absolute latitude				-0.001	0.000	0.001	0.002	-0.002	-0.007
				(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.006)
GSP per capita 2010					-0.003**	-0.004**	-0.005**	-0.003**	-0.005
					(0.001)	(0.002)	(0.002)	(0.001)	(0.003)
Observations	50	50	50	50	50	50	50	50	34
R-squared	0.001	0.717	0.719	0.722	0.755	0.768	0.774	0.797	0.774
Region fixed effects	N	Y	Y	Y	Y	Y	Y	Y	Y

C Additional results for event study

This section investigates the robustness of the main results in Panel B of Table 4. Overall, intrinsic religiosity (importance of God and religious person) increases with earthquakes, while extrinsic religiosity (attendance at religious services) does not. This is consistent with the religious coping hypothesis, and inconsistent with a purely economic explanations, where individuals go to church for aid. Results using the share of religious persons are less robust to changes, while the average importance of God in a district is robust to most changes. This is not surprising, since whether or not individuals regard themselves as religious involves a much larger change than how important they rank God on a scale from zero to ten. Thus, the test using the share of religious persons is a more demanding one.

C.1 Data on earthquake events

Downloadable from the Comprehensive Earthquake Catalogue: earthquake.usgs.gov/monitoring/anss/. The U.S. Geological Survey provides the best available estimate of an earthquake's magnitude. Each method to measure magnitudes works over a limited range of magnitudes. Some methods are based on body waves (which travel deep within the structure of the earth) and some are based on surface waves (which primarily travel along the uppermost layers). All of the methods are designed to agree well over the range of magnitudes where they are reliable. Earthquake magnitude is a logarithmic measure of earthquake size, which means that the shaking will be 10 times as large during a magnitude 6 earthquake as during a magnitude 5 earthquake. The total amount of energy released by the earthquake, however, goes up by a factor of 32.

The number of earthquakes of all magnitudes in the data increases up until 1973 and the number of earthquakes of magnitudes below 5 increases over the entire period. While the number of earthquakes has not increased in reality, the implication is that earthquake detection technology must have improved over time. There has been no trend in the number of earthquakes of magnitude 5 or above since 1973. On the USGS website it says: "We may not rapidly locate earthquakes smaller than 5.0 outside the US unless they have caused significant damage or are widely felt. Earthquakes this small rarely cause significant damage. At times, some other agency may report an earthquake with a larger magnitude than what we compute from our data, especially for non-US events near magnitude 5.0. If our magnitude for the event is less than magnitude 5.0, we may not issue a rapid report for it."

Years since the last earthquake is coded as 100 in districts that did not experience an

earthquake since 1973. The results do not depend on this threshold.

C.2 Varying cut-off levels

The main analysis defines a district as being hit by an earthquake if the earthquake hit within 100 km of the district borders. Panels A and B of Table A26 show that the results are robust to varying the cut-off level from 0 to 200 km in increments of 50 km when using importance of God as the measure of religiosity. Panel C shows that the results using the share of religious persons are less robust to choice of cut-off levels. Part of the sensitivity seems to be due to a few outliers (removed in Panel D). The finding that attendance rates are unaffected by earthquakes is robust to different cut-off levels (Panel E). But when excluding outliers, churchgoing seems to fall with earthquakes in districts otherwise rarely hit for earthquakes that hit within district borders (cut off zero).

The reason for the varying number of observations is that district-years are excluded if an earthquake hit in the year of the interview, discussed in the main text. Note that this restriction also happens to exclude all districts where an earthquake hit within district borders for all cut-off levels 50-200.

Table A27. Main results with varying cut-off levels for when an earthquake is defined to hit a district

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Cut-off	0	50	100	150	200	0	50	100	150	200
Earthquake measure:	Earthquake dummy					Number earthquakes				
Panel A. Dependent variable: D. Importance of God										
Earthquake measure	0.107***	0.089**	0.093***	0.070***	0.067***	0.107***	0.074**	0.058**	0.044***	0.030***
	(0.035)	(0.035)	(0.028)	(0.022)	(0.018)	(0.035)	(0.033)	(0.021)	(0.009)	(0.009)
Earthq x Frequent earthquakes	-0.094**	-0.081**	-0.073**	-0.027	0.027	-0.103***	-0.083**	-0.053***	-0.040***	-0.019
	(0.037)	(0.035)	(0.029)	(0.024)	(0.080)	(0.033)	(0.032)	(0.019)	(0.012)	(0.014)
Observations	370	353	350	335	326	370	353	350	335	326
R-squared	0.341	0.336	0.338	0.319	0.317	0.340	0.334	0.333	0.316	0.310
District-years with earthquake	13	25	33	41	46	13	25	33	41	46
Panel B. Dependent variable: D. Importance of God (no outliers)										
Earthquake measure	0.092***	0.054***	0.066***	0.045*	0.042*	0.092***	0.046***	0.052***	0.033***	0.023***
	(0.030)	(0.015)	(0.015)	(0.026)	(0.024)	(0.030)	(0.013)	(0.011)	(0.010)	(0.008)
Earthq x Frequent earthquakes	-0.080**	-0.047**	-0.039**	-0.047**	0.007	-0.089***	-0.058***	-0.047***	-0.029***	-0.021**
	(0.034)	(0.018)	(0.016)	(0.018)	(0.006)	(0.029)	(0.014)	(0.011)	(0.009)	(0.009)
Observations	352	337	334	319	306	352	335	331	320	307
R-squared	0.412	0.405	0.408	0.391	0.402	0.412	0.406	0.406	0.388	0.399
District-years with earthquake	13	24	31	40	44	13	24	29	40	44
Panel C. Dependent variable: D. Religious person										
Earthquake measure	-0.002	0.031	0.062**	0.040	-0.002	-0.002	0.024	0.044***	0.028	0.011
	(0.036)	(0.033)	(0.027)	(0.054)	(0.028)	(0.036)	(0.021)	(0.014)	(0.026)	(0.019)
Earthq x Frequent earthquakes	0.011	0.007	-0.058	-0.079	0.069+	0.007	-0.028	-0.046**	-0.027	0.021
	(0.041)	(0.038)	(0.041)	(0.067)	(0.042)	(0.038)	(0.024)	(0.018)	(0.029)	(0.022)
Observations	390	373	370	355	345	390	373	370	355	345
R-squared	0.414	0.416	0.417	0.411	0.397	0.414	0.415	0.417	0.410	0.400
District-years with earthquake	14	25	33	38	42	14	25	33	38	42
Panel D. Dependent variable: D. Religious person (no outliers)										
Earthquake measure	-0.023	0.026+	0.064***	0.083**	0.028	-0.023	0.023*	0.046***	0.053***	0.031**
	(0.036)	(0.016)	(0.014)	(0.035)	(0.028)	(0.036)	(0.012)	(0.007)	(0.010)	(0.013)
Earthq x Frequent earthquakes	0.031	0.014	-0.046	-0.089***	0.039	0.028	-0.030**	-0.049***	-0.053***	0.015
	(0.039)	(0.028)	(0.034)	(0.031)	(0.059)	(0.037)	(0.014)	(0.012)	(0.014)	(0.018)
Observations	374	356	351	337	329	374	354	351	338	326
R-squared	0.495	0.514	0.517	0.523	0.498	0.495	0.515	0.517	0.517	0.500
District-years with earthquake	14	25	32	36	41	14	25	32	37	39
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A27 cont. Main results with varying cut-off levels for when an earthquake is defined to hit a district

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Cut-off	0	50	100	150	200	0	50	100	150	200
Earthquake measure:	Earthquake dummy					Number earthquakes				
Panel E. Dependent variable: D. attend religious services										
Earthquake measure	-0.061	-0.008	0.028	0.025	0.044	-0.063	-0.003	0.021	0.016	0.008
	(0.066)	(0.031)	(0.046)	(0.055)	(0.035)	(0.066)	(0.020)	(0.023)	(0.028)	(0.017)
Earthq x Frequent earthquakes	0.129	0.052	0.012	0.053	0.286***	0.078	0.015	-0.020	-0.004	0.029
	(0.102)	(0.044)	(0.077)	(0.119)	(0.068)	(0.074)	(0.023)	(0.026)	(0.039)	(0.036)
Observations	404	387	384	369	357	404	387	384	369	357
R-squared	0.517	0.509	0.516	0.509	0.531	0.515	0.508	0.515	0.507	0.517
District-years with earthquake	14	25	33	38	42	14	25	33	38	42
Panel F. Dependent variable: D. attend religious services (no outliers)										
Earthquake measure	-0.121***	-0.026	0.008	0.003	0.014	-0.121***	-0.010	0.006	0.008	0.006
	(0.015)	(0.019)	(0.012)	(0.033)	(0.010)	(0.015)	(0.013)	(0.013)	(0.018)	(0.005)
Earthq x Frequent earthquakes	0.140***	0.056**	-0.014	-0.008	0.070***	0.129***	0.022*	-0.005	-0.020	0.093**
	(0.015)	(0.020)	(0.019)	(0.038)	(0.015)	(0.012)	(0.011)	(0.010)	(0.017)	(0.034)
Observations	386	370	367	351	341	386	370	368	350	339
R-squared	0.549	0.527	0.529	0.531	0.544	0.549	0.525	0.530	0.529	0.547
District-years with earthquake	12	22	29	34	40	12	22	30	33	37
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. OLS estimates. The dependent variable is the change in the district average of importance of God in Panels A and B, district share of religious persons in Panels C and D, and average attendance at religious services in Panels E and F. Earthquakes are measured with the dummy variable in columns (1)-(5) and the number of earthquakes in columns (6)-(10). Outliers detected based on Cooks D>1.

C.3 Simple figure

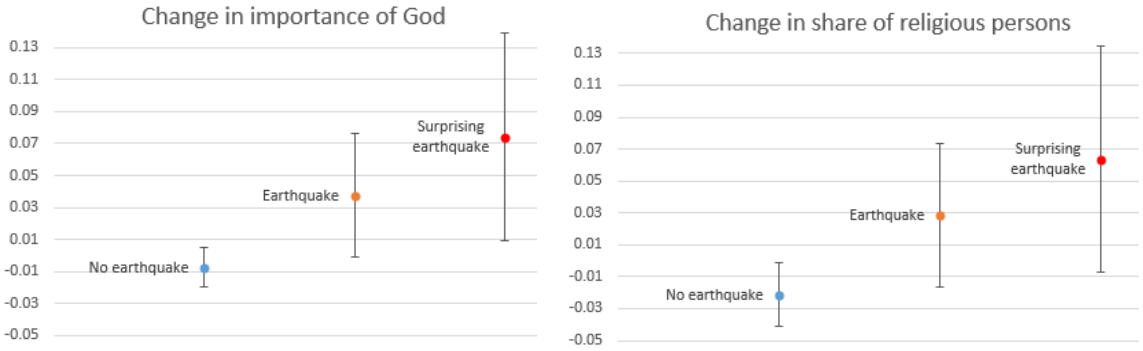


Figure A6 Change in religiosity by earthquake or not for window of 6 years or less

Notes. Lines show 90 pct confidence bounds.The sample is restricted to districts measured 6 years or less apart

C.4 Controls

C.4.1 Results with fewer controls

Table A28. Main results adding controls consecutively

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Avg	Diff	Diff	Diff	Diff	Diff	Diff	Diff	Diff	Diff
Panel A. Importance of God										
Earthquake dummy	0.17**	0.04	0.08*	0.07**	0.09**	0.08**	0.09***	0.09***	0.09***	0.09***
	(0.07)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Earthq x Frequent earthq	-0.27***	-0.07	-0.13**	-0.11**	-0.12***	-0.12***	-0.09**	-0.09***	-0.07**	-0.07**
	(0.08)	(0.05)	(0.06)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)
Observations	641	366	362	361	361	361	361	357	353	350
Districts	308	242	238	238	238	238	238	236	238	236
R-squared	0.04	0.01	0.16	0.26	0.26	0.27	0.32	0.32	0.34	0.34
Mean dep var	0.683	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.003
Panel B: Religious persons										
Earthquake dummy	0.12*	0.01	0.03	0.04	0.05*	0.05*	0.06**	0.06**	0.06**	0.06**
	(0.06)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Earthq x Frequent earthq	-0.19***	-0.02	-0.11***	-0.09**	-0.10***	-0.10***	-0.09**	-0.09**	-0.06	-0.06
	(0.07)	(0.05)	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Observations	630	386	382	381	381	381	381	377	373	370
Districts	289	256	252	252	252	252	252	250	252	250
R-squared	0.02	0.00	0.37	0.39	0.39	0.39	0.41	0.41	0.42	0.42
Mean dep var	0.686	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Panel C: Attendance at religious services										
Earthquake dummy	0.13***	-0.08***	0.00	0.01	0.02	0.02	0.03	0.03	0.02	0.02
	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)
Earthq x Frequent earthq	-0.21**	0.09	-0.03	-0.02	-0.03	-0.03	-0.01	-0.01	0.01	0.01
	(0.08)	(0.05)	(0.08)	(0.07)	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)	(0.08)
Observations	668	399	396	395	395	395	395	391	387	384
Districts	296	269	266	266	266	266	266	264	266	264
R-squared	0.03	0.02	0.43	0.48	0.48	0.48	0.50	0.50	0.51	0.51
Mean dep var	0.437	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.005	0.004
Country fixed effects	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Year fixed effects	N	N	N	Y	Y	Y	Y	Y	Y	Y
Years since last eq	N	N	N	N	Y	Y	Y	Y	Y	Y
Years between waves	N	N	N	N	N	Y	Y	Y	Y	Y
Country-specific trends	N	N	N	N	N	N	Y	N	Y	N
Country-by-year FE	N	N	N	N	N	N	N	Y	N	Y
Individual level controls	N	N	N	N	N	N	N	N	Y	Y

Notes. The dependent variable is based on the degree of importance of God in Panel A, religious persons in panel B, and the attendance at religious services in panel C. The dependent variable is in levels in column (1) and in changes in columns (2)-(10). Standard errors are clustered at the country level. Asterisks ***, **, *, and + indicate significance at the 1, 5, 10%, and 15% level, respectively.

C.4.2 Additional controls

Table A29 adds ten income fixed effects. The sample is restricted to the sample with information on individual income in uneven columns, while ten income fixed effects are added to the set of baseline controls in even columns. Table A30 adds the same additional measures of cultural values as added in Table A14. The results are unaltered.

Table A29. Main results with individual income fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Earthquakes measure:	Earthquake dummy		Number earthquakes		Earthquake dummy		Number earthquakes		Earthquake dummy		Number earthquakes	
Dependent variable:	D.Importance of God				D.Religious person				D.Attend services			
Earthquake measure	0.087***	0.084***	0.054**	0.053***	0.065**	0.054*	0.045***	0.039***	0.016	0.010	0.014	0.011
	(0.029)	(0.026)	(0.020)	(0.018)	(0.027)	(0.027)	(0.013)	(0.012)	(0.045)	(0.045)	(0.022)	(0.022)
Earthq x Frequent earthq	-0.068**	-0.074**	-0.049**	-0.052***	-0.061	-0.078*	-0.047**	-0.048**	0.022	0.022	-0.014	-0.013
	(0.029)	(0.027)	(0.018)	(0.017)	(0.041)	(0.039)	(0.018)	(0.018)	(0.076)	(0.070)	(0.024)	(0.023)
Observations	276	276	276	276	296	296	296	296	310	310	310	310
R-squared	0.349	0.282	0.344	0.278	0.435	0.388	0.435	0.389	0.527	0.442	0.526	0.442
Income FE	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A30. Main results with controls for various alternative values

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Alternative value:		Manners	Independe	Work	Responsibil	Imaginatio	Respect	Thrift	Persevere	Faith	Unselfish	Obedience
Panel A. Dependent variable: D.importance of God												
Earthquake dummy	0.093***	0.140*	0.090***	0.091***	0.089***	0.096***	0.093***	0.092***	0.084***	0.096***	0.090***	0.092***
	(0.028)	(0.071)	(0.030)	(0.029)	(0.025)	(0.028)	(0.028)	(0.030)	(0.028)	(0.032)	(0.029)	(0.032)
Earthq x Frequent earthq	-0.073**	-0.093	-0.069**	-0.072**	-0.070**	-0.064**	-0.074**	-0.074**	-0.065**	-0.089**	-0.069**	-0.060
	(0.029)	(0.075)	(0.032)	(0.030)	(0.030)	(0.031)	(0.030)	(0.031)	(0.030)	(0.033)	(0.030)	(0.036)
R-squared	0.338	0.397	0.348	0.336	0.343	0.339	0.344	0.339	0.352	0.265	0.340	0.312
Difference p-value		0.527	0.924	0.941	0.886	0.919	0.999	0.982	0.763	0.916	0.921	0.984
Number earthquakes	0.058**	0.140*	0.057**	0.056**	0.056***	0.061***	0.058**	0.057**	0.052**	0.064***	0.055**	0.055**
	(0.021)	(0.072)	(0.023)	(0.022)	(0.020)	(0.022)	(0.022)	(0.023)	(0.021)	(0.023)	(0.023)	(0.025)
Earthq x Frequent earthq	-0.053***	-0.236***	-0.048**	-0.052**	-0.052***	-0.055**	-0.053***	-0.053**	-0.047**	-0.057***	-0.050**	-0.047*
	(0.019)	(0.072)	(0.022)	(0.020)	(0.019)	(0.020)	(0.019)	(0.021)	(0.019)	(0.021)	(0.020)	(0.023)
R-squared	0.333	0.404	0.344	0.331	0.338	0.334	0.339	0.333	0.348	0.262	0.334	0.305
Difference p-value		0.283	0.972	0.937	0.933	0.870	0.977	0.984	0.799	0.776	0.911	0.923
Observations	350	65	350	334	350	331	350	350	331	350	331	350
Panel B. Dependent variable: D.Religious person												
Earthquake dummy	0.062**	0.184**	0.061**	0.052*	0.059**	0.054**	0.060**	0.060**	0.046	0.053*	0.052*	0.059**
	(0.027)	(0.080)	(0.026)	(0.028)	(0.024)	(0.026)	(0.027)	(0.028)	(0.029)	(0.030)	(0.027)	(0.027)
Earthq x Frequent earthq	-0.058	0.071*	-0.055	-0.052	-0.056	-0.043	-0.057	-0.058	-0.042	-0.046	-0.048	-0.048
	(0.041)	(0.034)	(0.039)	(0.043)	(0.036)	(0.040)	(0.041)	(0.041)	(0.043)	(0.049)	(0.042)	(0.039)
R-squared	0.417	0.631	0.421	0.282	0.419	0.292	0.414	0.415	0.285	0.405	0.284	0.421
Difference p-value		0.162	0.981	0.732	0.902	0.776	0.949	0.946	0.602	0.790	0.744	0.913
Number earthquakes	0.044***	0.184**	0.044***	0.037**	0.042***	0.041***	0.043***	0.043***	0.035**	0.043***	0.038**	0.040***
	(0.014)	(0.081)	(0.014)	(0.014)	(0.013)	(0.013)	(0.014)	(0.015)	(0.014)	(0.015)	(0.014)	(0.015)
Earthq x Frequent earthq	-0.046**	-0.272***	-0.042**	-0.040**	-0.044**	-0.042**	-0.045**	-0.044**	-0.035*	-0.035**	-0.039**	-0.041**
	(0.018)	(0.080)	(0.018)	(0.019)	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)
R-squared	0.417	0.632	0.421	0.282	0.419	0.292	0.414	0.415	0.286	0.406	0.284	0.420
Difference p-value		0.117	0.965	0.653	0.924	0.844	0.971	0.945	0.564	0.981	0.673	0.827
Observations	370	76	370	354	370	354	370	370	351	351	354	370
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A30 cont. Main results with controls for various alternative values

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Alternative value:		Manners	Independence	Work	Responsibility	Imagination	Respect	Thrift	Perseverence	Faith	Unselfish	Obedience
Panel C. Dependent variable: D.attend religious services												
Earthquake dummy	0.024	-0.022	0.024	0.018	0.020	0.019	0.024	0.023	0.012	0.033	0.017	0.023
	(0.044)	(0.033)	(0.046)	(0.043)	(0.049)	(0.044)	(0.044)	(0.044)	(0.042)	(0.042)	(0.044)	(0.045)
Earthq x Frequent earthq	0.014	0.054	0.013	0.018	0.017	0.025	0.013	0.013	0.026	0.005	0.020	0.023
	(0.077)	(0.041)	(0.078)	(0.075)	(0.085)	(0.078)	(0.076)	(0.077)	(0.074)	(0.068)	(0.076)	(0.082)
R-squared	0.513	0.270	0.503	0.527	0.503	0.517	0.511	0.514	0.542	0.388	0.525	0.504
Difference p-value		0.201	0.997	0.895	0.941	0.917	0.997	0.991	0.790	0.831	0.888	0.981
Number earthq	0.017	-0.022	0.018	0.014	0.015	0.016	0.018	0.017	0.011	0.026	0.013	0.015
	(0.022)	(0.033)	(0.023)	(0.022)	(0.024)	(0.022)	(0.022)	(0.022)	(0.021)	(0.022)	(0.022)	(0.023)
Earthq x Frequent earthq	-0.018	-0.031	-0.016	-0.014	-0.016	-0.016	-0.018	-0.017	-0.010	-0.018	-0.013	-0.014
	(0.025)	(0.033)	(0.026)	(0.024)	(0.027)	(0.024)	(0.024)	(0.025)	(0.023)	(0.025)	(0.024)	(0.026)
R-squared	0.513	0.271	0.502	0.526	0.502	0.517	0.510	0.514	0.541	0.388	0.524	0.503
Difference p-value		0.267	0.997	0.862	0.935	0.942	0.985	0.972	0.742	0.695	0.835	0.906
Observations	384	76	384	368	384	368	384	384	365	365	368	384
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. OLS estimates. The table replicates Panel B of Table 4 adding various additional values as controls. All are described by Table A14. "Difference p-value" indicates the p-value of the test that the estimate on earthquakes in low risk districts equals the estimate in column (1).

Table A31 includes ethnicity fixed effects (variable x051).

Table A31. Main results with ethnicity fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.:	D.impgod		D.relpers			D.service
Panel A. Earthquake dummy						
Earthquake dummy	0.067**	0.055**	0.064	0.077	0.129	0.054
	(0.029)	(0.024)	(0.060)	(0.071)	(0.076)	(0.074)
R-squared	0.371	0.320	0.534	0.485	0.439	0.450
Panel B. Number earthquakes						
Number earthquakes	0.017*	0.015**	0.032*	0.031	0.028	0.016
	(0.010)	(0.007)	(0.017)	(0.022)	(0.025)	(0.021)
R-squared	0.367	0.317	0.535	0.484	0.425	0.447
Observations	145	145	143	143	143	143
Baseline controls	Y	Y	Y	Y	Y	Y
Ethnicity fixed effects	Y	N	Y	N	Y	N

Notes. OLS estimates. The table replicates Panel B of Table 4 adding ethnicity fixed effects in odd columns. Even columns exclude ethnic fixed effects on the sample restricted to that with information on ethnicity.

C.5 Comparison of the estimate sizes

C.5.1 Standardized beta coefficients

Table A32. Main results with standardized coefficients

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.	D.impgod	D.rel_pers	D.service	D.impgod	D.rel_pers	D.service
Panel A. Baseline results						
Earthquake dummy	0.226***	0.109**	0.089	0.229***	0.100**	0.116
	(0.069)	(0.044)	(0.078)	(0.073)	(0.045)	(0.087)
R-squared	0.335	0.414	0.509	0.335	0.424	0.398
P-value beta=.229				1	0.00723	0.204
Panel B. Allowing for differential effect depending on how frequent the district is hit						
Earthquake dummy	0.276***	0.127**	0.061	0.282***	0.113**	0.093
	(0.082)	(0.055)	(0.115)	(0.089)	(0.055)	(0.123)
Earthquake dummy x Frequent earthq	-0.172**	-0.097	0.029	-0.177**	-0.065	0.039
	(0.068)	(0.068)	(0.159)	(0.074)	(0.063)	(0.179)
R-squared	0.338	0.417	0.513	0.338	0.427	0.408
P-value beta=.282				1	0.00444	0.135
Observations	350	370	384	338	338	338
Baseline controls	Y	Y	Y	Y	Y	Y
Sample	full	full	full	same	same	same

C.5.2 Same sample

Table A33 replicates Table 4 to the sample across columns.

Table A33. Main results restricted to the same sample across columns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	D.impgod		D.relpers		D.service		D.impgod		D.relpers		D.service	
Earthquake measure:	Earthquake dummy								Number earthquakes			
Panel A. Linear effects of earthquakes												
Earthquake measure	0.077***	0.074***	0.049**	0.042**	0.043	0.039	0.077***	0.074***	0.049**	0.042**	0.043	0.039
	(0.025)	(0.023)	(0.022)	(0.020)	(0.032)	(0.040)	(0.025)	(0.023)	(0.022)	(0.020)	(0.032)	(0.040)
R-squared	0.335	0.305	0.424	0.425	0.398	0.417	0.335	0.305	0.424	0.425	0.398	0.417
Panel B. Allowing for differential effects depending on how frequent the district is hit												
Earthquake measure	0.095***	0.088***	0.056**	0.053**	0.034	0.030	0.095***	0.088***	0.056**	0.053**	0.034	0.030
	(0.030)	(0.026)	(0.027)	(0.023)	(0.045)	(0.053)	(0.030)	(0.026)	(0.027)	(0.023)	(0.045)	(0.053)
Earthq x Frequent earthq	-0.075**	-0.062*	-0.041	-0.043+	0.018	0.058	-0.075**	-0.062*	-0.041	-0.043+	0.018	0.058
	(0.031)	(0.033)	(0.039)	(0.029)	(0.083)	(0.095)	(0.031)	(0.033)	(0.039)	(0.029)	(0.083)	(0.095)
R-squared	0.338	0.307	0.427	0.428	0.408	0.430	0.338	0.307	0.427	0.428	0.408	0.430
Panel C. Placebo regressions												
Earthquake measure w+1	-0.026	-0.016	0.027	0.027	-0.054	-0.052	-0.025	-0.016	0.018	0.018	-0.047	-0.042
	(0.021)	(0.026)	(0.043)	(0.049)	(0.049)	(0.047)	(0.018)	(0.021)	(0.037)	(0.042)	(0.044)	(0.041)
Earthq w+1 x Frequent earthq	-0.016	-0.032	-0.004	-0.012	0.113+	0.129**	0.016	0.009	-0.018	-0.016	0.034	0.033
	(0.021)	(0.028)	(0.048)	(0.055)	(0.067)	(0.058)	(0.017)	(0.021)	(0.034)	(0.040)	(0.043)	(0.042)
R-squared	0.319	0.290	0.425	0.426	0.410	0.431	0.319	0.290	0.425	0.425	0.409	0.428
Observations	338	312	338	312	338	312	338	312	338	312	338	312
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Education dummies	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Districts	236	230	250	240	264	254	236	230	250	240	264	254
Countries	31	30	31	30	32	31	31	30	31	30	32	31
Number Fixed effects	46	50	47	49	48	50	46	50	47	49	48	50

Notes. The table replicates Table 4 on the restricted sample where all three religiosity measures are available.

C.6 Different measures of frequent earthquakes

In the main analysis, a district is defined as having been hit frequently by earthquakes if the district lies in the top 95^{th} percentile in terms of the number of earthquakes that hit during the period for which there is comparable data on earthquake instances, 1973-2014. This turns out to equal seven earthquakes or more. Columns (1)-(3), (5)-(7), and (9)-(11) of Table A34 show that the results do not depend on the exact choice of percentile, particularly when measuring religiosity along the intensive margin (importance of God and attendance rates). Again the extensive margin (share of religious persons) is somewhat less robust. The results are also robust to using instead a dummy equal to one if the district is located within the earthquake zone 3 or 4 as defined in the cross-district analysis (columns 4, 8, and 12).

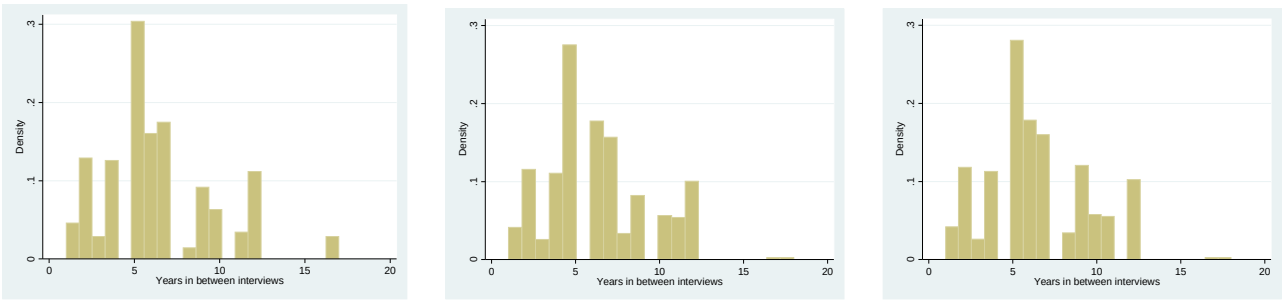
Table A34. Main results with different high-frequency measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	D.importance of God				D.religious person				D.Attend services			
Panel A. Earthquake dummy												
Earthquake dummy	0.131***	0.093***	0.078***	0.098**	0.062	0.062**	0.052**	0.071***	0.022	0.024	0.033	0.030
	(0.046)	(0.028)	(0.024)	(0.037)	(0.050)	(0.027)	(0.022)	(0.025)	(0.091)	(0.044)	(0.031)	(0.047)
Earthq x Frequent earthq	-0.093+	-0.073**	-0.045*	-0.048	-0.031	-0.058	0.008	-0.041	0.016	0.014	0.038	0.011
	(0.058)	(0.029)	(0.024)	(0.042)	(0.050)	(0.041)	(0.022)	(0.030)	(0.100)	(0.077)	(0.031)	(0.064)
R-squared	0.342	0.338	0.335	0.338	0.416	0.417	0.414	0.415	0.509	0.513	0.509	0.509
Panel B. Number earthquakes												
Number earthquakes	0.100**	0.058**	0.030**	0.058*	0.050+	0.044***	0.023***	0.029*	-0.003	0.017	0.014	0.006
	(0.043)	(0.021)	(0.012)	(0.030)	(0.033)	(0.014)	(0.007)	(0.016)	(0.066)	(0.022)	(0.010)	(0.018)
Earthq x Frequent earthq	-0.088*	-0.053***	-0.024*	-0.044+	-0.038	-0.046**	-0.006	-0.012	0.018	-0.018	0.004	0.015
	(0.047)	(0.019)	(0.012)	(0.030)	(0.033)	(0.018)	(0.007)	(0.016)	(0.071)	(0.025)	(0.010)	(0.020)
R-squared	0.337	0.333	0.326	0.331	0.416	0.417	0.413	0.414	0.509	0.513	0.508	0.509
Observations	350	350	350	350	370	370	370	370	384	384	384	384
High risk measure	>=90 pct	>=95 pct	>=99 pct	zone	>=90 pct	>=95 pct	>=99 pct	zone	>=90 pct	>=95 pct	>=99 pct	zone
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. OLS estimates. The dependent variable is the change in the district aggregate of importance of God in columns (1)-(4), the change in the share of religious persons in columns (5)-(8), and the change in average attendance rates in columns (9)-(12). Panel A measures earthquakes with a dummy equal to one if the district was hit by one or more earthquakes. In Panel B, the earthquake measure is the actual number of earthquakes. Baseline controls are the same as those in Table 4.

C.7 Dynamics and period lengths

The main regressions exclude district-years measured more than 10 years apart. Figure A7 shows the distribution of years between interviews in the samples where the three different religiosity measures are non-missing.



Importance of God | Religious person | Services

Figure A7. Distribution of the number of years between interviews

Table A35. Main results with same window lengths

	(1)	(2)	(3)	(4)
Panel A. Dep var: Changes in importance of God				
Earthquake dummy	0.19**	0.16*	0.22**	0.22**
	(0.09)	(0.08)	(0.09)	(0.08)
Earthq x Frequent earthq	-0.18**	-0.05	-0.07	-0.07**
	(0.09)	(0.10)	(0.10)	(0.02)
Observations	92	90	88	88
Districts	61	59	58	58
R-squared	0.07	0.36	0.40	0.40
Panel B. Dep var: Changes in religious person				
Earthquake dummy	-0.05	-0.00	0.04	0.04
	(0.08)	(0.12)	(0.13)	(0.07)
Earthq x Frequent earthq	0.15*	0.02	0.01	0.01
	(0.08)	(0.14)	(0.14)	(0.02)
Observations	93	91	89	89
Districts	61	59	58	58
R-squared	0.03	0.09	0.10	0.10
Panel C. Dep var: Changes in attendance rates				
Earthquake dummy	-0.07	-0.09	-0.09	-0.09***
	(0.07)	(0.08)	(0.09)	(0.02)
Earthq x Frequent earthq	0.12*	0.01	0.02	0.02*
	(0.07)	(0.10)	(0.10)	(0.01)
Observations	93	91	89	89
Districts	61	59	58	58
R-squared	0.02	0.10	0.08	0.08
	(0.05)			
Country and year FE	N	Y	Y	Y
Country-by-year FE	N	N	Y	Y
Clustered se at country level	N	N	N	Y

Notes. The dependent variable is changes in average importance of God in Panel A, religious persons in panel B, and the attendance at religious services in panel C. Years since last earthquake is included throughout. Robust standard errors in columns (1)-(3). Standard errors are clustered at the country level in columns (4). Asterisks ***, **, *, and + indicate significance at the 1, 5, 10%, and 15% level, respectively.

Table A36 exploits the difference in period lengths in order to investigate the short-term dynamics of the effect of earthquakes. The main analysis excludes districts with more than 10 years in between interviews. Column (1) shows that the results are robust to using the full sample of period lengths. Columns (2)-(9) narrows the window of observation more as we move to the right in the table from 12 years or below to 5 years or below. The reason for not reducing the window of observation further is that the interaction with "Frequent earthquakes" cannot be estimated in this sample. The impact of earthquakes on intrinsic religiosity increases when narrowing the window of observation, consistent with the idea that the impact falls over time. Table A37 shows that this is not because the period length depends on characteristics such as earthquakes, district-level average income, education, age of the respondents, fraction males, or fraction married. The finding that attendance rates are unaffected by earthquakes is robust to different period lengths (Panel C).

Table A36. Main results restricted by different window of observation lengths

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Periodlength	All	<=12	<=11	<=10	<=9	<=8	<=7	<=6	<=5
Panel A. Dependent variable: D.Importance of God									
Avg period length	6.327	6.111	5.540	5.369	5.058	4.747	4.692	4.172	3.701
Earthquake dummy = 1	0.087***	0.084***	0.091***	0.093***	0.097***	0.097***	0.097***	0.133**	0.200**
	(0.026)	(0.026)	(0.027)	(0.028)	(0.030)	(0.030)	(0.030)	(0.052)	(0.077)
Earthq x Frequent earthquakes	-0.049	-0.047	-0.071**	-0.073**	-0.078**	-0.078**	-0.078**	-0.089**	-0.142*
	(0.030)	(0.030)	(0.028)	(0.029)	(0.032)	(0.032)	(0.032)	(0.041)	(0.068)
R-squared	0.456	0.407	0.348	0.338	0.327	0.320	0.321	0.326	0.384
Number earthquakes	0.056***	0.054***	0.057**	0.058**	0.059**	0.059**	0.059**	0.138**	0.220***
	(0.019)	(0.018)	(0.021)	(0.021)	(0.023)	(0.023)	(0.023)	(0.052)	(0.061)
Earthq x Frequent earthquakes	-0.045***	-0.043***	-0.052***	-0.053***	-0.054**	-0.054**	-0.054**	-0.120**	-0.188***
	(0.016)	(0.016)	(0.019)	(0.019)	(0.021)	(0.021)	(0.021)	(0.047)	(0.058)
R-squared	0.453	0.405	0.343	0.333	0.320	0.313	0.314	0.327	0.388
Observations	404	396	361	350	328	304	299	244	194
Panel B. Dependent variable: D.Religious person									
Avg period length	6.261	6.233	5.715	5.443	5.155	4.870	4.740	4.254	3.708
Earthquake dummy = 1	0.049*	0.049*	0.052*	0.062**	0.059*	0.059*	0.059*	0.049	0.098+
	(0.028)	(0.028)	(0.028)	(0.027)	(0.029)	(0.029)	(0.029)	(0.065)	(0.057)
Earthq x Frequent earthquakes	-0.066	-0.066	-0.075+	-0.058	-0.056	-0.056	-0.056	0.023	0.024
	(0.046)	(0.046)	(0.049)	(0.041)	(0.043)	(0.043)	(0.043)	(0.059)	(0.061)
R-squared	0.465	0.465	0.429	0.417	0.417	0.415	0.414	0.418	0.453
Number earthquakes	0.027	0.027	0.039**	0.044***	0.042***	0.042***	0.042***	0.048	0.110**
	(0.020)	(0.020)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.066)	(0.050)
Earthq x Frequent earthquakes	-0.048*	-0.048*	-0.062**	-0.046**	-0.044**	-0.044**	-0.044**	-0.041	-0.079+
	(0.026)	(0.026)	(0.024)	(0.018)	(0.018)	(0.018)	(0.018)	(0.063)	(0.048)
R-squared	0.466	0.466	0.431	0.417	0.417	0.415	0.414	0.418	0.452
Observations	425	424	389	370	348	324	311	256	195
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A36 cont. Main results restricted by different window of observation lengths

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Periodlength	All	<=12	<=11	<=10	<=9	<=8	<=7	<=6	<=5
Panel C. Dependent variable: D.Attend religious services									
Avg period length	6.349	6.322	5.829	5.573	5.304	4.870	4.740	4.254	3.708
Earthquake dummy	0.024	0.024	0.019	0.024	0.025	0.025	0.025	0.068	-0.051
	(0.043)	(0.043)	(0.045)	(0.044)	(0.048)	(0.048)	(0.048)	(0.095)	(0.041)
Earthq x Frequent earthq	-0.010	-0.010	0.004	0.014	0.013	0.013	0.013	-0.058	0.033
	(0.065)	(0.065)	(0.075)	(0.077)	(0.080)	(0.080)	(0.080)	(0.086)	(0.067)
R-squared	0.512	0.512	0.513	0.513	0.502	0.486	0.486	0.488	0.214
Number earthquakes	0.019	0.019	0.015	0.017	0.018	0.018	0.018	0.070	-0.055
	(0.021)	(0.021)	(0.022)	(0.022)	(0.023)	(0.023)	(0.024)	(0.097)	(0.040)
Earthq x Frequent earthq	-0.031	-0.031	-0.026	-0.018	-0.018	-0.018	-0.018	-0.065	0.048
	(0.022)	(0.022)	(0.024)	(0.025)	(0.026)	(0.026)	(0.026)	(0.089)	(0.038)
R-squared	0.513	0.513	0.513	0.513	0.501	0.485	0.485	0.488	0.214
Observations	439	438	403	384	362	324	311	256	195
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. OLS estimates. The dependent variables are changes in district average importance of God in Panel A, the share of religious persons in Panel B, and average attendance at religious services in Panel C. Each panel includes two types of regressions using the earthquake dummy and the number of earthquakes.

Table A37. OLS estimates of period lengths on the main variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Earthquake measure:				Earthquake dummy						Number earthquakes		
Dependent variable: Period length												
Earthquake measure	-0.001	-0.019	0.033	-0.007	0.000	-0.006	0.006	0.012	0.049	0.022	0.027	0.022
	(0.018)	(0.049)	(0.072)	(0.056)	(0.064)	(0.055)	(0.010)	(0.041)	(0.059)	(0.043)	(0.052)	(0.046)
Earthq x Frequent earthquakes	0.106	0.316	0.230	0.233	0.251	0.236	0.021	0.025	-0.015	0.010	0.005	0.009
	(0.090)	(0.248)	(0.198)	(0.199)	(0.204)	(0.184)	(0.030)	(0.037)	(0.048)	(0.047)	(0.050)	(0.045)
Years since an earthquake hit	-0.000	-0.002	-0.001	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Average education		0.098						0.095				
		(0.109)						(0.106)				
Average income			0.119						0.118			
			(0.088)						(0.086)			
Share males				0.297						0.306		
				(0.455)						(0.449)		
Average age					0.001						0.001	
					(0.014)						(0.013)	
Share married						-0.000						-0.005
						(0.837)						(0.832)
Observations	2,159	717	669	785	775	788	2,159	717	669	785	775	788
R-squared	0.879	0.882	0.856	0.883	0.883	0.883	0.880	0.882	0.857	0.884	0.884	0.884

Notes. OLS estimates. The dependent variable is period length measured by the number of years between interviews. The measure of earthquakes is the earthquake dummy in columns (1)-(6) and the number of earthquakes in columns (7)-(12).

An alternative way to test the dynamics is to estimate the district aggregate of equation (1) with district fixed effects and adding lags of earthquakes. This is done in Table A38 on the full sample. Past earthquakes are aggregated into groups of three years, since there is too much noise and too few earthquakes in the year-intervals of 1 or 2 years. "Earthquakes t-1 - t-3" measures whether earthquakes hit the district within the past three years, measuring earthquakes by the earthquake dummy in columns (1)-(3) and the number of earthquakes in columns (4)-(6). "Earthquakes t-4 – t-6" measures whether earthquakes hit between four and six years ago, "Earthquakes t-7 – t-9" between seven and nine years ago, and "Earthquakes t10-12" between ten and twelve years ago. All columns include district fixed effects, country-by-year fixed effects, and the remaining baseline controls. Panel A estimates the simple linear effect, while Panel B includes the interaction with the "Frequent earthquakes" dummy.

Earthquakes that hit within the last nine years increase intrinsic religiosity significantly more than earthquakes that hit longer time ago. The result is again stronger on the intensive margin; average importance of God is affected more than the share of religious persons. Again, churchgoing is not affected. There is, however, a negative effect from earthquakes 10-12 years ago, which seems odd and is neither consistent with religious coping nor a pure economic effect.

Title A38. OLS estimates of religiosity on different lags of earthquakes

	(1)	(2)	(3)	(4)	(5)	(6)
Earthquake measure	Earthquake dummy			Number earthquakes		
Dependent variable	impgod	rel_pers	service	impgod	rel_pers	service
Panel A. Baseline regressions						
Earthquakes t-1 - t-3	0.063***	0.036**	-0.035	0.021*	0.012*	-0.009
	(0.016)	(0.016)	(0.023)	(0.011)	(0.007)	(0.006)
Earthquakes t-4 - t-6	0.010	-0.018	0.038	0.005	-0.013	0.009
	(0.019)	(0.023)	(0.037)	(0.006)	(0.010)	(0.013)
Earthquakes t-7 - t-9	0.032	0.027	-0.012	0.015	0.015	-0.001
	(0.020)	(0.023)	(0.024)	(0.012)	(0.014)	(0.017)
Earthquakes t-10 - t-12	0.011	0.034*	-0.055***	0.003	0.011	-0.027***
	(0.011)	(0.020)	(0.011)	(0.006)	(0.011)	(0.007)
R-squared	0.950	0.926	0.920	0.949	0.926	0.919
Panel B. Interactions with high earthquake frequency						
Earthquakes t-1 - t-3	0.087***	0.045**	-0.041	0.061***	0.023	-0.020
	(0.017)	(0.017)	(0.025)	(0.014)	(0.016)	(0.017)
x High frequency	-0.073***	-0.023	0.038	-0.059***	-0.016	0.007
	(0.020)	(0.025)	(0.031)	(0.015)	(0.017)	(0.015)
Earthquakes t-4 - t-6	0.052**	-0.006	0.061	0.034**	-0.006	0.049
	(0.022)	(0.034)	(0.047)	(0.014)	(0.022)	(0.032)
x High frequency	-0.114***	-0.048	-0.082*	-0.048***	-0.019	-0.071**
	(0.031)	(0.039)	(0.041)	(0.017)	(0.028)	(0.033)
Earthquakes t-7 - t-9	0.061**	0.019	-0.026	0.040**	0.008	-0.016
	(0.023)	(0.026)	(0.023)	(0.019)	(0.017)	(0.018)
x High frequency	-0.055*	0.036	0.061	-0.031	0.022	0.050**
	(0.027)	(0.033)	(0.044)	(0.019)	(0.017)	(0.021)
Earthquakes t-10 - t-12	0.018	0.027	-0.054***	0.014	0.018	-0.033***
	(0.011)	(0.022)	(0.013)	(0.010)	(0.017)	(0.012)
x High frequency	-0.039**	0.020	-0.034*	-0.024**	-0.016	-0.005
	(0.018)	(0.028)	(0.020)	(0.009)	(0.017)	(0.013)
R-squared	0.951	0.926	0.921	0.950	0.926	0.921
Observations	687	716	744	687	716	744
District FE	Y	Y	Y	Y	Y	Y
Country-by-year FE	Y	Y	Y	Y	Y	Y
Remaining baseline controls	N	Y	N	Y	N	Y

Notes. OLS estimates. The unit of analysis is a district at time t. The dependent variable is average importance of God in columns (1)-(2) and (5)-(6) and the share of religious persons in columns (3)-(4) and (7-8). The earthquake measure is the earthquake dummy in columns (1)-(4) and the number of earthquakes in columns (5)-(8). Panel A estimates the simple linear effect, while Panel B includes the interaction between the earthquake measure and the dummy variable equal to one if the district was hit by 7 earthquakes or more over the period 1973-2014. All columns include a constant. Standard errors (in parenthesis) are clustered at the country level. Asterisks ***, **, *, and + indicate significance at the 1, 5, 10, and 15% level, respectively.

C.8 Sample restricted to districts with earthquakes

Table A39 restricts the sample to districts that had at least one earthquake in between survey rounds. The table shows that religiosity increased more in districts with more earthquakes in districts that were otherwise rarely hit, compared to districts that were frequently hit by earthquakes.

Table A39. Main results restricted to districts with at least one earthquake

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.	D.impgod		D.rel_pers		D.service	
Number earthquakes	0.023***	0.019**	0.061***	0.062***	0.052**	0.064***
	(0.004)	(0.007)	(0.002)	(0.001)	(0.018)	(0.009)
Earthq x frequent earthq	-0.042**	-0.033*	-0.079***	-0.073***	-0.121*	-0.159***
	(0.013)	(0.014)	(0.007)	(0.003)	(0.049)	(0.023)
Observations	26	24	26	24	26	24
R-squared	0.861	0.770	0.543	0.484	0.628	0.761
Baseline controls	Y	Y	Y	Y	Y	Y
Inc and edu dummies	N	Y	N	Y	N	Y
Districts	24	24	24	24	24	24
Countries	6	6	6	6	6	6

C.9 Future earthquakes

To construct future earthquakes in years after the latest measure of the religiosity measure, I choose five-year period lengths, as this is the most common period length (Section C.7).

Instead of the placebo test in Panel C of Table 4, one could also do a horse race between future and current earthquakes.[63] Panel A of Table A40 confirms that earthquakes in between survey rounds increase religiosity, while future earthquakes do not. This is despite the high correlation between current and future earthquakes (ρ =0.47). Panel B allows the impact of the earthquakes to differ with the frequency with which the district is otherwise hit. Current earthquakes still increase religiosity. Future earthquakes do not, except in columns (1) and (2), where future earthquakes reduce religiosity in districts that are frequently hit. This result should be interpreted with caution, though, as the correlation between the interaction terms with the frequently hit dummy is 0.85. The variance inflation factor of the interaction term between frequent and future earthquakes in col (1) of Panel B is 16.55, and the results potentially suffer from multicollinearity.

[63] Thanks to an anonymous referee for suggesting this.

Table A40. Main results including future earthquakes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep. var.:	D.impgod		D.relpers		D.service		D.impgod		D.relpers		D.service	
Earthq measure:	Earthquake dummy						Number earthquakes					
Panel A. Simple horserace												
Earthquake t	0.076***	0.073***	0.052**	0.048**	0.035	0.031	0.032***	0.028***	0.019***	0.017***	0.016*	0.015
	(0.023)	(0.022)	(0.021)	(0.020)	(0.030)	(0.038)	(0.011)	(0.009)	(0.005)	(0.005)	(0.009)	(0.009)
Earthquake t+1	-0.012	-0.007	0.040	0.039	-0.009	-0.003	-0.012	-0.012	0.008	0.008	-0.004	-0.002
	(0.015)	(0.019)	(0.024)	(0.028)	(0.049)	(0.048)	(0.008)	(0.008)	(0.010)	(0.009)	(0.014)	(0.015)
Observations	350	324	370	333	384	347	350	324	370	333	384	347
R-squared	0.335	0.314	0.416	0.415	0.509	0.507	0.327	0.306	0.413	0.412	0.508	0.506
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Inc and edu dummies	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Districts	236	236	236	236	236	236	236	230	250	240	264	254
Countries	31	30	31	30	32	31	31	30	31	30	32	31
Panel B. Horserace including interaction with frequently hit districts												
Earthquake t	0.092***	0.087***	0.068**	0.066**	0.012	0.008	0.057**	0.052**	0.045***	0.045***	0.013	0.012
	(0.030)	(0.026)	(0.031)	(0.028)	(0.051)	(0.058)	(0.022)	(0.022)	(0.016)	(0.015)	(0.025)	(0.028)
Earthq t x Frequent	-0.050+	-0.036	-0.064	-0.070*	0.008	0.041	-0.048**	-0.043*	-0.046**	-0.046***	-0.011	-0.011
	(0.033)	(0.044)	(0.051)	(0.040)	(0.073)	(0.088)	(0.022)	(0.023)	(0.020)	(0.016)	(0.026)	(0.030)
Earthquake t+1	-0.007	-0.000	0.034	0.038	-0.061	-0.055	-0.014	-0.006	0.013	0.018	-0.048	-0.038
	(0.027)	(0.031)	(0.043)	(0.049)	(0.052)	(0.050)	(0.021)	(0.024)	(0.032)	(0.035)	(0.037)	(0.035)
Earthq t+1 x Frequent	-0.064**	-0.076*	-0.023	-0.028	0.093	0.088	0.001	-0.003	-0.014	-0.015	0.034	0.030
	(0.029)	(0.038)	(0.068)	(0.067)	(0.057)	(0.052)	(0.023)	(0.027)	(0.032)	(0.036)	(0.038)	(0.035)
Observations	350	324	370	333	384	347	350	324	370	333	384	347
R-squared	0.340	0.318	0.418	0.416	0.518	0.517	0.334	0.311	0.417	0.416	0.517	0.515
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Inc and edu dummies	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Districts	236	236	236	236	236	236	236	230	250	240	264	254
Countries	31	30	31	30	32	31	31	30	31	30	32	31

C.10 Different magnitudes

The main results are based on earthquakes of magnitude 6 or above. Table A41 uses different magnitude cut-offs, ranging from 5 or above in columns (1) and (7) to 6.5 or above in columns (6) and (12). The magnitude scale is logarithmic, so the shaking felt at magnitude 6 is ten times larger than the magnitude felt at magnitude 5. The reason for showing both results for earthquakes of magnitudes 5 and above and results for earthquakes of above 5 in magnitude is that many earthquake cluster around the even numbers, due to rounding errors.

The impact of earthquakes on intrinsic religiosity increases with most magnitude increases. Further, it takes larger earthquakes to influence the extensive margin (religious person) compared to the intensive margin (importance of God). Attending religious services is not influenced throughout, except when restricting the earthquake measure to include only earthquakes of magnitudes greater than 6.5. Oddly enough, here earthquakes reduce attendance rates in low-risk districts, which is neither consistent with religious coping nor a pure economic effect. This result, though, may be influenced by outliers, as there are only 16 districts in the sample with earthquakes of magnitudes above 6.5. Excluding outliers removes the negative effect on religious services (not shown), but in this sample, the interaction with frequent earthquakes is not estimated, and the two estimations are not directly comparable.

The reason for the change in the number of observations is that the analysis - in line with the main analysis - excludes district-years with earthquakes in the same year as the interview.

Table A41. Main results for different earthquake magnitudes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Earthquake measure:	Earthquake dummy						Number earthquakes					
Panel A. Dependent variable: D. importance of God												
Earthquake measure	0.012	0.044	0.052**	0.093***	0.088***	0.088***	0.009	0.018	0.034***	0.058**	0.054**	0.088***
	(0.016)	(0.031)	(0.020)	(0.028)	(0.031)	(0.029)	(0.009)	(0.015)	(0.012)	(0.021)	(0.021)	(0.029)
Earthquake x Frequent earthq			0.023	-0.073**	-0.087**	-0.080***			-0.030**	-0.053***	-0.052**	-0.088***
			(0.019)	(0.029)	(0.038)	(0.028)			(0.012)	(0.019)	(0.020)	(0.028)
Observations	278	282	318	350	350	365	278	282	318	350	350	365
R-squared	0.297	0.297	0.314	0.338	0.335	0.332	0.300	0.295	0.312	0.333	0.330	0.331
No. districts w earthq	57	48	32	29	26	15	57	48	32	29	26	15
Panel B. Dependent variable: D. religious person												
Earthquake measure	-0.054	-0.006	-0.010	0.062**	0.070***	0.066***	-0.001	0.010*	-0.014	0.044***	0.047***	0.065***
	(0.041)	(0.024)	(0.039)	(0.027)	(0.023)	(0.017)	(0.005)	(0.006)	(0.018)	(0.014)	(0.013)	(0.016)
Earthquake x Frequent earthq			-0.009	-0.058	-0.056	-0.003			0.027	-0.046**	-0.050**	-0.044*
			(0.040)	(0.041)	(0.048)	(0.037)			(0.018)	(0.018)	(0.021)	(0.026)
Observations	298	302	338	370	370	386	298	302	338	370	370	386
R-squared	0.393	0.379	0.401	0.417	0.418	0.419	0.383	0.380	0.401	0.417	0.417	0.417
No. districts w earthq	61	52	33	29	26	16	61	52	33	29	26	16
Panel C. Dependent variable: D. attend religious services												
Earthquake measure	-0.015	-0.007	-0.007	0.024	-0.021	-0.045**	-0.010	-0.009	-0.015	0.017	0.001	-0.045**
	(0.018)	(0.017)	(0.035)	(0.044)	(0.027)	(0.017)	(0.007)	(0.011)	(0.018)	(0.022)	(0.015)	(0.017)
Earthquake x Frequent earthq			0.145***	0.014	0.019	0.076***			0.072***	-0.018	-0.009	0.067***
			(0.028)	(0.077)	(0.038)	(0.021)			(0.018)	(0.025)	(0.017)	(0.017)
Observations	312	316	352	384	384	400	312	316	352	384	384	400
R-squared	0.515	0.528	0.521	0.513	0.516	0.513	0.518	0.529	0.528	0.513	0.516	0.513
No. districts w earthq	63	54	33	29	26	16	63	54	33	29	26	16
Magnitude	>=5	>5	>=5.5	>=6	>6	>=6.5	>=5	>5	>=5.5	>=6	>6	>=6.5
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. OLS estimates. The dependent variable is the change in the district aggregate of importance of God in your life in Panel A, the share of religious persons in Panel B, and average attendance at religious services in Panel C. Earthquakes are measured using the dummy in columns (1)-(6) and the number of earthquakes in columns (7)-(12). Only earthquakes above magnitude x are included in the analysis, where x ranges from magnitude 5 in columns (1) and (7) to magnitude 6.5 in columns (6) and (12). Baseline controls are the same as those in Table 4.

C.11 Alternative religiosity measures

The main analysis includes only the three measures of religiosity with the most observations. Table A42 shows the results for the remaining measures of religiosity. Earthquakes do not increase believing when measured by the three individual measures; whether or not a person finds comfort in religion, believes in God, or believes in an Afterlife. Whether this is evidence of the tendency that conversion rates are harder to influence or whether this is simply due to the reduced sample size is not possible to say. The two composite measures Strength of Religiosity Scale and Strength of Intrinsic Religiosity Scale are significantly affected by earthquakes (columns 7-10).

Table A42. Main results with the religiosity measures available for smaller samples

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	D.comfort		D.believe		D.after		D.reli		D.rel	
Panel A. Earthquake dummy										
Earthquake dummy	-0.001	-0.010	-0.001	0.001	0.062	0.072	0.048**	0.048**	0.045**	0.043*
	(0.018)	(0.016)	(0.013)	(0.011)	(0.071)	(0.074)	(0.018)	(0.019)	(0.020)	(0.021)
Earthq x Frequent earthq	-0.023	0.041	-0.013	-0.008	-0.070	-0.079	-0.071**	-0.034+	-0.052	-0.021
	(0.027)	(0.029)	(0.010)	(0.011)	(0.073)	(0.082)	(0.026)	(0.022)	(0.036)	(0.032)
R-squared	0.240	0.240	0.355	0.355	0.382	0.401	0.456	0.487	0.430	0.451
Panel B. Number earthquakes										
Number earthquakes	0.000	-0.007	-0.001	-0.002	0.022	0.022	0.026*	0.024+	0.024*	0.021+
	(0.010)	(0.009)	(0.006)	(0.006)	(0.042)	(0.044)	(0.013)	(0.014)	(0.013)	(0.014)
Earthq x Frequent earthq	-0.029	0.008	-0.012	-0.005	-0.032	-0.022	-0.049*	-0.024+	-0.036*	-0.018
	(0.026)	(0.010)	(0.009)	(0.008)	(0.044)	(0.043)	(0.024)	(0.015)	(0.019)	(0.017)
R-squared	0.245	0.239	0.358	0.356	0.377	0.393	0.457	0.482	0.428	0.445
Observations	181	174	181	174	181	174	180	173	180	173
Baseline controls	N	Y	N	Y	N	Y	N	Y	N	Y
Districts	125	125	125	125	125	125	125	125	125	125
Countries	16	16	16	16	16	16	16	16	16	16

Notes. OLS estimates. The dependent variable in columns (1)-(2) is the change in the district aggregate of answers to "Do you find comfort in God?", "Do you believe in God?" in columns (3-4), "Do you believe in Afterlife?" in columns (5-6), the Strength of Intrinsic Religiosity Scale in columns (7-8) and the Strength of Religiosity Scale in columns (9-10). All columns include a constant. Standard errors (in parenthesis) are clustered at the country level. Asterisks ***, **, *, and + indicate significance at the 1, 5, 10, and 15\% level, respectively.

Table A43 shows that insignificance is not due to the smaller sample size.

Table A43. Main results restricted to the sample of the remaining religiosity measures

	(1)	(2)	(3)	(4)	(5)	(6)
Earthquake measure		Dummy			Number	
Dependent variable:	D.impgod	D.rel_pers	D.service	D.impgod	D.rel_pers	D.service
Earthquake dummy	0.092***	0.097**	0.039	0.052**	0.062**	0.026
	(0.031)	(0.041)	(0.052)	(0.021)	(0.023)	(0.025)
inst_high	-0.072*	-0.074	0.042	-0.051**	-0.057**	0.002
	(0.034)	(0.051)	(0.098)	(0.021)	(0.023)	(0.030)
Observations	173	174	174	173	174	174
R-squared	0.300	0.534	0.353	0.289	0.533	0.350
Baseline controls	Y	Y	Y	Y	Y	Y

C.11.1 Different categorizations of the religiosity measures

This section investigates the results viz-a-viz different categorizations of the two religiosity measures that are not dummy variables. The different categorizations are described in Section B.11. Again the importance of God measure is robust to different categorizations and the impact of earthquake risk is stemming exclusively from the intensive margin. Attendance at religious services is unaffected by earthquake risk throughout.

Table A44. Main results with different categorizations of the measure of churchgoing

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Attendance at religious services					
Earthquake dummy	0.035	0.034	0.037	0.058	0.001	0.011
	(0.029)	(0.030)	(0.043)	(0.053)	(0.018)	(0.049)
Observations	384	384	384	384	384	383
R-squared	0.500	0.509	0.437	0.350	0.691	0.309
Baseline controls	Y	Y	Y	Y	Y	Y
Attendance measure	org	base	frequent1	frequent2	extensive	intensive

Table A45. Main results with different categorizations of the importance of God measure

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Importance of God					
Earthquake dummy	0.076***	0.117**	0.130***	0.019*	0.070**
	(0.023)	(0.044)	(0.034)	(0.011)	(0.028)
Observations	350	350	350	350	350
R-squared	0.335	0.430	0.630	0.353	0.225
Baseline controls	Y	Y	Y	Y	Y
Importance of God measure	base	important1	important2	extensive	intensive

C.12 Heterogeneity by religion and continents

C.12.1 Heterogeneity by initial religiosity

Columns (1), (4), and (7) of Table A46 replicate the corresponding columns in Panel B of Table 4. The remaining columns add initial religiosity and its interaction with earthquakes. The impact of earthquakes on religiosity does not depend on the initial level of religiosity. The main results are unchanged.

Table A46. Main results including initial religiosity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	D.impgod			D.relpers			D.service		
Panel A. Earthquake dummy									
Earthquake dummy	0.093***	0.072***	0.072**	0.062**	0.052***	0.045**	0.024	0.024	0.005
	(0.028)	(0.017)	(0.030)	(0.027)	(0.016)	(0.020)	(0.044)	(0.040)	(0.024)
Earthq x Frequent earthq	-0.073**	-0.063***	-0.063***	-0.058	-0.055**	-0.048**	0.014	0.032	0.047
	(0.029)	(0.017)	(0.017)	(0.041)	(0.023)	(0.022)	(0.077)	(0.069)	(0.062)
Initital religiosity		-0.616***	-0.615***		-0.577***	-0.580***		-0.610***	-0.612***
		(0.137)	(0.137)		(0.091)	(0.092)		(0.084)	(0.084)
Earthq x initial rel			-0.008			0.068			0.145
			(0.125)			(0.065)			(0.164)
R-squared	0.338	0.540	0.540	0.417	0.584	0.584	0.513	0.627	0.628
Panel B. Number earthquakes									
Number earthquakes	0.058**	0.045***	0.051***	0.044***	0.038***	0.033***	0.017	0.021	0.011
	(0.021)	(0.012)	(0.018)	(0.014)	(0.009)	(0.011)	(0.022)	(0.020)	(0.015)
Earthq x Frequent earthq	-0.053***	-0.048***	-0.056**	-0.046**	-0.045***	-0.033**	-0.018	-0.017	-0.002
	(0.019)	(0.012)	(0.021)	(0.018)	(0.012)	(0.014)	(0.025)	(0.023)	(0.018)
Initial religiosity		-0.620***	-0.617***		-0.578***	-0.579***		-0.609***	-0.609***
		(0.138)	(0.138)		(0.091)	(0.091)		(0.084)	(0.084)
Earthq x initial rel			-0.038			0.030			0.080
			(0.049)			(0.019)			(0.051)
R-squared	0.333	0.538	0.538	0.417	0.584	0.584	0.513	0.626	0.628
Observations	350	350	350	370	370	370	384	384	384
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. OLS estimates. The dependent variables are changes in district average of importance of God in columns (1)-(3), the share of religious persons in columns (4)-(6), and average attendance at religious services in columns (7)-(9). Panel A measures earthquakes with a dummy equal to one if the district was hit by one or more earthquakes. In Panel B, the earthquake measure is the actual number of earthquakes. Baseline controls are the same as those in Table 4.

C.12.2 Heterogeneity by denominations

District-level religiosity is calculated for Christians, Muslims, etc. in Table A47. Like the corresponding tables in Section B.12, average religiosity is calculated for each denomination separately and thereafter aggregated to the district level. Earthquakes increase intrinsic religiosity for all denominations, while churchgoing is unaffected across all denominations.

Table A47. Main results restricted to different religious denominations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Religious denomination	All	Christian	Catholic	Protestant	Muslim	Buddhist	Hindu	Other
Panel A. Dependent variable: D.importance of God								
Earthquake dummy	0.093***	0.093***	0.092***	0.097***	0.092***	0.089***	0.084***	0.094***
	(0.028)	(0.027)	(0.028)	(0.027)	(0.028)	(0.028)	(0.029)	(0.027)
Earthq x Frequent earthq	-0.073**	-0.074**	-0.074**	-0.075**	-0.075**	-0.074**	-0.069**	-0.075**
	(0.029)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.030)	(0.028)
Observations	350	350	350	350	350	350	350	350
R-squared	0.338	0.330	0.326	0.339	0.327	0.323	0.339	0.327
Number earthquakes	0.058**	0.059***	0.059***	0.059***	0.059***	0.059***	0.055**	0.059***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)	(0.021)	(0.021)
Earthq x Frequent earthq	-0.053***	-0.055***	-0.055***	-0.054***	-0.056***	-0.055***	-0.051**	-0.055***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.018)	(0.018)	(0.019)	(0.019)
Observations	350	350	350	350	350	350	350	350
R-squared	0.333	0.325	0.322	0.332	0.323	0.320	0.336	0.322
Panel B. Dependent variable: D.religious person								
Earthquake dummy	0.062**	0.060**	0.059**	0.064**	0.059**	0.065**	0.060**	0.063**
	(0.027)	(0.027)	(0.027)	(0.026)	(0.026)	(0.027)	(0.026)	(0.028)
Earthq x Frequent earthq	-0.058	-0.058	-0.058	-0.060	-0.058	-0.062	-0.058	-0.063
	(0.041)	(0.041)	(0.041)	(0.040)	(0.041)	(0.041)	(0.040)	(0.042)
Observations	370	370	370	370	370	370	370	370
R-squared	0.417	0.418	0.417	0.420	0.417	0.418	0.421	0.416
Number earthquakes	0.044***	0.044***	0.044***	0.044***	0.044***	0.045***	0.043***	0.045***
	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)
Earthq x Frequent earthq	-0.046**	-0.046**	-0.046**	-0.046**	-0.047**	-0.049**	-0.046**	-0.049**
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)	(0.018)
Observations	370	370	370	370	370	370	370	370
R-squared	0.417	0.418	0.417	0.420	0.417	0.417	0.421	0.416
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y

Table A47 cont. Main results restricted to different religious denominations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Religious denomination	All	Christian	Catholic	Protestant	Muslim	Buddhist	Hindu	Other
Panel C. Dependent variable: D.attend religious services								
Earthquake dummy	0.024	0.025	0.023	0.030	0.026	0.020	0.021	0.026
	(0.044)	(0.044)	(0.044)	(0.045)	(0.044)	(0.044)	(0.045)	(0.044)
Earthq x Frequent earthq	0.014	0.012	0.013	0.010	0.014	0.016	0.015	0.010
	(0.077)	(0.077)	(0.076)	(0.079)	(0.074)	(0.076)	(0.077)	(0.077)
Observations	384	384	384	384	384	384	384	384
R-squared	0.513	0.511	0.506	0.523	0.508	0.508	0.510	0.505
Number earthquakes	0.017	0.017	0.017	0.017	0.024	0.017	0.016	0.018
	(0.022)	(0.022)	(0.022)	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)
Earthq x Frequent earthq	-0.018	-0.018	-0.018	-0.018	-0.023	-0.018	-0.017	-0.019
	(0.025)	(0.025)	(0.024)	(0.026)	(0.024)	(0.024)	(0.024)	(0.024)
Observations	384	384	384	384	384	384	384	384
R-squared	0.513	0.510	0.506	0.522	0.508	0.507	0.510	0.504
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y

Notes. The dependent variable is the district level change in the average importance of God in Panel A, the change in the share of religious persons in Panel B, and the change in the district average attendance at religious services in Panel C. Each panel contains a set of regressions, where earthquakes is measured as a dummy and a set where earthquakes is measured as the actual number of earthquakes. The district level average in column (1) is calculated as in Table 4, while the average in column (2) is only based on Christians, Catholics in column (3), Protestants in column (4), etc.

Table A48. Main results including denomination fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.:	D.impgod		D.relpers		D.service	
Panel A. Earthquake measure based on earthquake dummy						
Earthquake dummy	0.098***	0.096***	0.065**	0.064**	0.008	0.005
	(0.030)	(0.029)	(0.026)	(0.027)	(0.047)	(0.047)
Earthq x Frequent	-0.092**	-0.081**	-0.066*	-0.050	-0.014	0.001
	(0.038)	(0.034)	(0.034)	(0.036)	(0.075)	(0.077)
R-squared	0.343	0.315	0.399	0.397	0.281	0.268
Panel A. Earthquake measure based on number of earthquakes						
Number earthquakes	0.060**	0.058**	0.047***	0.046***	0.008	0.006
	(0.023)	(0.022)	(0.013)	(0.014)	(0.025)	(0.025)
Earthq x Frequent	-0.061***	-0.058***	-0.050***	-0.046***	-0.025	-0.022
	(0.021)	(0.021)	(0.015)	(0.016)	(0.023)	(0.023)
R-squared	0.338	0.310	0.399	0.397	0.282	0.269
Observations	338	338	367	367	381	381
Baseline controls	Y	Y	Y	Y	Y	Y
59 denominations FE	Y	N	Y	N	Y	N
6 major denominations FE	N	Y	N	Y	N	Y
Districts	227	227	227	227	227	227
Countries	30	30	31	31	32	32

C.12.3 Heterogeneity by continents

As continents are measured at the district-level, this part of the analysis is done like the cross-districts analysis. Corroborating the finding of the cross-districts analysis, earthquakes increase religiosity across all continents. While there were no differences between continents in the cross-districts study, Table A49 shows that earthquakes in Europe increase religiosity more than other places, but mainly on the intensive margin (importance of God and churchgoing). Earthquakes in Oceania only seem to have an impact on the share of religious persons. The latter only covers 9 districts, though. Churchgoing is unaffected across all continents, except Europe, where earthquakes tend to increase churchgoing. The latter is consistent with both religious coping and a pure economic effect.

Table A49. Main results interacted with different continents

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Earthquake measure:			Earthquake dummy						Number earthquakes			
Panel A. Dependent variable: D.Importance of God												
Earthquake measure	0.093***	0.095***	0.095***	0.068**	0.098***	0.089***	0.058**	0.058**	0.058**	0.052***	0.060**	0.055**
	(0.028)	(0.030)	(0.028)	(0.025)	(0.030)	(0.028)	(0.021)	(0.022)	(0.022)	(0.018)	(0.023)	(0.020)
Earthq x Frequent earthq	-0.073**	-0.075**	-0.059**	-0.067***	-0.079**	-0.069**	-0.053***	-0.054**	-0.053***	-0.053***	-0.054**	-0.051***
	(0.029)	(0.032)	(0.022)	(0.024)	(0.032)	(0.029)	(0.019)	(0.020)	(0.018)	(0.018)	(0.020)	(0.018)
Earthquake x Africa		-0.032						-0.001				
		(0.038)						(0.032)				
Earthquake x America			-0.037						-0.005			
			(0.025)						(0.009)			
Earthquake x Asia				0.033						0.007		
				(0.038)						(0.017)		
Earthquake x Oceania					-0.075**						-0.063**	
					(0.035)						(0.027)	
Earthquake x Europe						0.086***						0.119***
						(0.029)						(0.022)
Observations	350	350	350	350	350	350	350	350	350	350	350	350
R-squared	0.338	0.338	0.338	0.339	0.339	0.339	0.333	0.333	0.333	0.333	0.334	0.334
Panel B. Dependent variable: D.Religious person												
Earthquake measure	0.062**	0.062**	0.059**	0.106***	0.058*	0.061**	0.044***	0.044***	0.043***	0.067***	0.043***	0.043***
	(0.027)	(0.027)	(0.028)	(0.033)	(0.029)	(0.028)	(0.014)	(0.014)	(0.014)	(0.021)	(0.014)	(0.014)
Earthq x Frequent earthq	-0.058	-0.058	-0.080**	-0.069*	-0.055	-0.058	-0.046**	-0.046**	-0.050**	-0.048**	-0.046**	-0.045**
	(0.041)	(0.041)	(0.037)	(0.034)	(0.043)	(0.042)	(0.018)	(0.018)	(0.019)	(0.019)	(0.018)	(0.018)
Earthquake x America			0.066						0.029			
			(0.055)						(0.019)			
Earthquake x Asia				-0.054						-0.026		
				(0.040)						(0.017)		
Earthquake x Oceania					0.040						0.003	
					(0.036)						(0.049)	
Earthquake x Europe						0.013						0.031*
						(0.028)						(0.015)
Observations	370	370	370	370	370	370	370	370	370	370	370	370
R-squared	0.417	0.417	0.418	0.418	0.417	0.417	0.417	0.417	0.418	0.418	0.417	0.417
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A49 cont. Main results interacted with different continents

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Earthquake measure:			Earthquake dummy						Number earthquakes			
Panel C. Dependent variable: D.Importance of God												
Earthquake measure	0.024	0.024	0.027	0.006	0.025	0.016	0.017	0.017	0.018	0.021	0.018	0.014
	(0.044)	(0.044)	(0.045)	(0.062)	(0.048)	(0.045)	(0.022)	(0.022)	(0.022)	(0.029)	(0.023)	(0.022)
Earthq x Frequent earthq	0.014	0.014	0.041	0.018	0.013	0.022	-0.018	-0.018	-0.018	-0.018	-0.018	-0.014
	(0.077)	(0.077)	(0.091)	(0.080)	(0.080)	(0.076)	(0.025)	(0.025)	(0.026)	(0.025)	(0.025)	(0.024)
Earthquake x America			-0.081						-0.003			
			(0.083)						(0.025)			
Earthquake x Asia				0.021						-0.004		
				(0.059)						(0.021)		
Earthquake x Oceania					-0.011						-0.022	
					(0.045)						(0.021)	
Earthquake x Europe						0.152***						0.155***
						(0.044)						(0.021)
Observations	384	384	384	384	384	384	384	384	384	384	384	384
R-squared	0.513	0.513	0.514	0.513	0.513	0.515	0.513	0.513	0.513	0.513	0.513	0.514
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. The dependent variable is the change in average importance of God in Panel A, the change in the share of religious persons in Panel B, and the change in the average attendance at religious services in Panel C. The mesaure of earthquakes is the earthquake dummy in columns (1)-(6) and the number of earthquakes in columns (7)-(12).

C.13 Heterogeneity by development

As the variables in the event study are aggregated to the district level, the interactions with individual characteristics, such as income levels, is done in a slightly different manner than in the cross-district study. The complication arises as individual-level controls are added at the individual level throughout, and thereafter residuals are aggregated.

The baseline result is reproduced in column (1) of Table A49 on the full sample of individuals of any income deciles. In column (2), average religiosity is calculated only among individuals with incomes in the lowest decile. Column (3) restricts the sample to individuals with income among the second decile, and so on until average religiosity is calculated in column (11) for individuals with the highest incomes only. Earthquakes influence religiosity similarly across all income deciles with no tendency for higher or lower incomes groups to respond more or less to earthquakes. Earthquakes do not affect churchgoing regardless of which income decile, the individual belongs to. The same results hold for all education groups and unemployed or not (Tables A50 and A51).

The same question is investigated in a slightly different manner in Table A52 with a focus on *district* level development. Religiosity is calculated based on the full sample of individuals and earthquakes are instead interacted with district level income, light intensity, education, and unemployment rates. The impact of earthquakes on intrinsic religiosity is larger in districts with lower levels of average income or education, but the impact does not differ with light intensity or unemployment levels. Churchgoing is again unaffected by earthquakes, and this is the case across income or education groups, except that churchgoing does seem to be slightly more affected for those living in districts with higher average unemployment rates. This latter finding is both consistent with religious coping and a pure economic effect.

Table A50. Main results restricted to different income deciles

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Income decile	All	1	2	3	4	5	6	7	8	9	10
Panel A. Dependent variable: D.importance of God											
Earthquake dummy	0.093***	0.090***	0.094***	0.094***	0.095***	0.096***	0.095***	0.095***	0.096***	0.094***	0.094***
	(0.028)	(0.028)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.028)	(0.028)
Earthq dummy x Frequent earthq	-0.073**	-0.073**	-0.075**	-0.074**	-0.075**	-0.075**	-0.074**	-0.075**	-0.075**	-0.073**	-0.074**
	(0.029)	(0.029)	(0.028)	(0.029)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.029)	(0.028)
Observations	350	350	350	350	350	350	350	350	350	350	350
R-squared	0.338	0.339	0.337	0.339	0.339	0.338	0.335	0.335	0.331	0.332	0.315
Difference p-value		0.924	0.977	0.966	0.935	0.919	0.953	0.939	0.925	0.974	0.982
Number earthquakes	0.058**	0.057**	0.058***	0.058**	0.059***	0.059***	0.059***	0.059***	0.059***	0.059***	0.060***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.020)
Number earthq x Frequent earthq	-0.053***	-0.053***	-0.055***	-0.054***	-0.055***	-0.055***	-0.055***	-0.055***	-0.055***	-0.054***	-0.056***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Observations	350	350	350	350	350	350	350	350	350	350	350
R-squared	0.333	0.335	0.332	0.333	0.334	0.332	0.329	0.329	0.325	0.327	0.311
Difference p-value		0.969	0.976	0.980	0.967	0.949	0.955	0.957	0.938	0.965	0.903
Panel B. Dependent variable: D.Religious person											
Earthquake dummy	0.062**	0.060**	0.060**	0.061**	0.063**	0.064**	0.065**	0.065**	0.066**	0.065**	0.064**
	(0.027)	(0.026)	(0.026)	(0.027)	(0.026)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.028)
Earthq dummy x Frequent earthq	-0.058	-0.057	-0.059	-0.059	-0.059	-0.061	-0.061	-0.062	-0.061	-0.061	-0.061
	(0.041)	(0.040)	(0.041)	(0.041)	(0.040)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)	(0.042)
Observations	370	370	370	370	370	370	370	370	370	370	370
R-squared	0.417	0.420	0.420	0.419	0.419	0.419	0.417	0.421	0.414	0.418	0.413
Difference p-value		0.946	0.949	0.989	0.958	0.915	0.900	0.911	0.882	0.887	0.940
Number earthquakes	0.044***	0.043***	0.043***	0.044***	0.044***	0.045***	0.045***	0.044***	0.045***	0.045***	0.045***
	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)
Number earthq x Frequent earthq	-0.046**	-0.045**	-0.046**	-0.046**	-0.047**	-0.048**	-0.047**	-0.047**	-0.047**	-0.047**	-0.048**
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Observations	370	370	370	370	370	370	370	370	370	370	370
R-squared	0.417	0.420	0.420	0.419	0.419	0.419	0.417	0.420	0.413	0.418	0.413
Difference p-value		0.948	0.975	0.995	0.959	0.914	0.919	0.957	0.911	0.921	0.922
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A50 cont. Main results restricted to different income deciles

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Income decile	All	1	2	3	4	5	6	7	8	9	10
Panel C. Dependent variable: D.attend religious services											
Earthquake dummy	0.024	0.021	0.023	0.024	0.024	0.027	0.026	0.025	0.026	0.025	0.024
	(0.044)	(0.045)	(0.045)	(0.045)	(0.045)	(0.044)	(0.044)	(0.044)	(0.043)	(0.044)	(0.043)
Earthq x Frequent earthq	0.014	0.016	0.014	0.014	0.014	0.012	0.012	0.012	0.012	0.014	0.013
	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)	(0.076)	(0.076)	(0.076)	(0.075)	(0.076)	(0.075)
Observations	384	384	384	384	384	384	384	384	384	384	384
R-squared	0.513	0.518	0.516	0.516	0.514	0.512	0.509	0.508	0.502	0.506	0.503
Difference p-value		0.960	0.992	0.996	0.995	0.947	0.952	0.978	0.960	0.983	0.993
Number earthquakes	0.017	0.017	0.018	0.018	0.018	0.019	0.019	0.018	0.019	0.018	0.018
	(0.022)	(0.023)	(0.023)	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Earthq x Frequent earthq	-0.018	-0.017	-0.018	-0.018	-0.018	-0.020	-0.020	-0.019	-0.020	-0.018	-0.019
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Observations	384	384	384	384	384	384	384	384	384	384	384
R-squared	0.513	0.517	0.515	0.516	0.514	0.512	0.508	0.507	0.502	0.506	0.502
Difference p-value		0.979	0.993	0.987	0.978	0.934	0.935	0.972	0.947	0.980	0.971
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. The table replicates Panel B of Table 4, where religiosity is instead measured only across individuals from the particular income decile. "Difference p-value" indicates the p-value of the test that the estimate on the earthquake measure equals the estimate in column (1).

Table A51. Main results restricted to different education categories

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Education category	All	1	2	3	4	5	6	7	8
Panel A. Dependent variable: D.importance of God									
Earthquake dummy	0.093***	0.093***	0.095***	0.093***	0.095***	0.095***	0.094***	0.098***	0.095***
	(0.028)	(0.027)	(0.027)	(0.028)	(0.028)	(0.027)	(0.027)	(0.027)	(0.027)
Earthq x Frequent earthq	-0.073**	-0.075**	-0.075**	-0.072**	-0.073**	-0.074**	-0.074**	-0.075**	-0.075**
	(0.029)	(0.028)	(0.028)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
Observations	350	350	350	350	350	350	350	350	350
R-squared	0.338	0.335	0.338	0.349	0.338	0.351	0.342	0.353	0.346
Difference p-value		0.988	0.927	0.995	0.956	0.933	0.970	0.850	0.948
Number earthquakes	0.058**	0.059***	0.059***	0.056**	0.058**	0.057**	0.058**	0.058**	0.058**
	(0.021)	(0.021)	(0.021)	(0.022)	(0.022)	(0.022)	(0.021)	(0.022)	(0.022)
Earthq x Frequent earthq	-0.053***	-0.055***	-0.055***	-0.052**	-0.054***	-0.053**	-0.054***	-0.054**	-0.054***
	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)	(0.020)	(0.019)	(0.020)	(0.019)
Observations	350	350	350	350	350	350	350	350	350
R-squared	0.333	0.330	0.332	0.343	0.333	0.344	0.336	0.346	0.340
Difference p-value		0.959	0.966	0.952	0.984	0.979	0.993	0.983	0.991
Panel B. Dependent variable: D.Religious person									
Earthquake dummy	0.062**	0.063**	0.061**	0.059**	0.062**	0.062**	0.064**	0.063**	0.064**
	(0.027)	(0.026)	(0.027)	(0.026)	(0.027)	(0.026)	(0.026)	(0.026)	(0.026)
Earthq x Frequent earthq	-0.058	-0.060	-0.059	-0.054	-0.059	-0.057	-0.061	-0.058	-0.060
	(0.041)	(0.040)	(0.041)	(0.040)	(0.041)	(0.040)	(0.040)	(0.040)	(0.039)
Observations	370	370	370	370	370	370	370	370	370
R-squared	0.417	0.420	0.418	0.416	0.417	0.420	0.421	0.420	0.423
Difference p-value		0.969	0.976	0.933	0.989	0.997	0.935	0.952	0.916
Number earthquakes	0.044***	0.045***	0.044***	0.042***	0.044***	0.043***	0.044***	0.043***	0.044***
	(0.014)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)	(0.014)	(0.013)
Earthq x Frequent earthq	-0.046**	-0.047**	-0.046**	-0.043**	-0.046**	-0.044**	-0.047**	-0.045**	-0.046**
	(0.018)	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)
Observations	370	370	370	370	370	370	370	370	370
R-squared	0.417	0.420	0.418	0.416	0.417	0.420	0.421	0.420	0.423
Difference p-value		0.940	0.996	0.917	0.989	0.955	0.960	0.980	0.989
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A51 cont. Main results restricted to different education categories

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Education category	All	1	2	3	4	5	6	7	8
Panel C. Dependent variable: D.attend religious services									
Earthquake dummy	0.024	0.024	0.023	0.025	0.026	0.026	0.024	0.028	0.026
	(0.044)	(0.045)	(0.045)	(0.045)	(0.044)	(0.045)	(0.045)	(0.045)	(0.045)
Earthq dummy x Frequent earthq	0.014	0.014	0.014	0.014	0.012	0.013	0.013	0.013	0.013
	(0.077)	(0.077)	(0.077)	(0.078)	(0.077)	(0.078)	(0.077)	(0.077)	(0.077)
Observations	384	384	384	384	384	384	384	384	384
R-squared	0.513	0.517	0.513	0.520	0.512	0.521	0.514	0.521	0.520
Difference p-value		0.996	0.984	0.971	0.956	0.962	0.992	0.933	0.963
Number earthquakes	0.017	0.019	0.017	0.016	0.018	0.017	0.018	0.018	0.018
	(0.022)	(0.023)	(0.022)	(0.023)	(0.022)	(0.023)	(0.022)	(0.023)	(0.023)
Earthq x Frequent earthq	-0.018	-0.020	-0.018	-0.016	-0.018	-0.017	-0.018	-0.018	-0.018
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Observations	384	384	384	384	384	384	384	384	384
R-squared	0.513	0.516	0.512	0.519	0.512	0.521	0.514	0.521	0.520
Difference p-value		0.939	0.997	0.952	0.983	0.967	0.989	0.994	0.973
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes. The table replicates Panel B of Table 4, where religiosity is instead measured only across individuals from the particular education category. "Difference p-value" indicates the p-value of the test that the estimate on the earthquake measure equals the estimate in column (1).

Table A52. Main results restricted to different employment status

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Earthquake measure	Earthquake dummy					Number earthquakes				
Sample	All	Unemployed		Employed		All	Unemployed		Employed	
Panel A. Dependent variable: D.importance of God										
Earthquake measure	0.093***	0.094***	0.088***	0.092***	0.083***	0.058**	0.059***	0.056***	0.057**	0.053***
	(0.028)	(0.028)	(0.028)	(0.028)	(0.026)	(0.021)	(0.021)	(0.018)	(0.021)	(0.018)
Earthq x Frequent earthq	-0.073**	-0.073**	-0.070**	-0.073**	-0.073**	-0.053***	-0.055***	-0.054***	-0.053***	-0.052***
	(0.029)	(0.029)	(0.028)	(0.029)	(0.027)	(0.019)	(0.019)	(0.017)	(0.019)	(0.017)
Observations	350	350	276	350	276	350	350	276	350	276
R-squared	0.338	0.335	0.293	0.338	0.284	0.333	0.330	0.290	0.333	0.281
Difference p-value		0.979	0.848	0.976	0.720		0.952	0.930	0.988	0.780
Panel B. Dependent variable: D.religious person										
Earthquake measure	0.062**	0.061**	0.058**	0.061**	0.054*	0.044***	0.043***	0.040***	0.043***	0.039***
	(0.027)	(0.026)	(0.026)	(0.027)	(0.027)	(0.014)	(0.014)	(0.013)	(0.014)	(0.013)
Earthq x Frequent earthq	-0.058	-0.056	-0.074*	-0.058	-0.078*	-0.046**	-0.044**	-0.047**	-0.046**	-0.048**
	(0.041)	(0.040)	(0.037)	(0.041)	(0.039)	(0.018)	(0.017)	(0.017)	(0.018)	(0.018)
Observations	370	370	296	370	296	370	370	296	370	296
R-squared	0.417	0.420	0.391	0.417	0.388	0.417	0.420	0.391	0.417	0.388
Difference p-value		0.984	0.895	0.981	0.767		0.947	0.796	0.993	0.738
Panel C. Dependent variable: D.attend religious services										
Earthquake measure	0.024	0.024	0.017	0.023	0.009	0.017	0.018	0.015	0.017	0.011
	(0.044)	(0.044)	(0.044)	(0.045)	(0.045)	(0.022)	(0.022)	(0.021)	(0.022)	(0.022)
Earthq x Frequent earthq	0.014	0.015	0.028	0.014	0.022	-0.018	-0.017	-0.013	-0.018	-0.013
	(0.077)	(0.076)	(0.072)	(0.077)	(0.070)	(0.025)	(0.024)	(0.023)	(0.025)	(0.022)
Observations	384	384	310	384	310	384	384	310	384	310
R-squared	0.513	0.510	0.483	0.513	0.442	0.513	0.510	0.482	0.512	0.441
Difference p-value		0.993	0.884	0.989	0.755		0.990	0.917	0.997	0.777
Baseline controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Income FE	N	N	Y	N	Y	N	N	Y	N	Y

Notes. The table replicates Panel B of Table 4, where religiosity is instead measured only across either employed or unemployed individuals. Difference p-value indicates the p-value of the test that the estimate equals the estimate in columns (1) and (6).

Table A53. Main results interacted with district development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. Dependent variable: D.Importance of God							
Earthquake dummy	0.510***	0.099***	0.251***	0.108**	0.069***	0.102***	0.099***
	(0.104)	(0.031)	(0.090)	(0.045)	(0.012)	(0.031)	(0.030)
Earthq x Frequent earthq	-0.037	-0.084**	-0.085***	-0.078**	-0.061***	-0.083**	-0.074**
	(0.027)	(0.036)	(0.030)	(0.031)	(0.022)	(0.032)	(0.032)
Earthq x development	-0.094***	-0.002	-0.037**	-0.102	0.307	-0.032	-0.014*
	(0.023)	(0.002)	(0.016)	(0.139)	(0.402)	(0.023)	(0.008)
Observations	276	350	348	348	276	350	350
R-squared	0.373	0.339	0.347	0.340	0.357	0.339	0.339
Panel B. Dependent variable: D.Religious person							
Earthquake dummy	0.322**	0.068**	0.308***	0.065	0.070***	0.090***	0.061**
	(0.132)	(0.028)	(0.095)	(0.048)	(0.025)	(0.024)	(0.029)
Earthq x Frequent earthq	-0.039	-0.069	-0.090*	-0.061	-0.051	-0.088**	-0.065*
	(0.050)	(0.043)	(0.053)	(0.044)	(0.039)	(0.037)	(0.038)
Earthq x development	-0.059**	-0.002	-0.056***	-0.020	-0.154*	-0.095***	0.010
	(0.027)	(0.002)	(0.017)	(0.170)	(0.077)	(0.020)	(0.016)
Observations	296	370	368	368	296	370	370
R-squared	0.444	0.418	0.426	0.418	0.437	0.419	0.417
Panel C. Dependent variable: D.Attend religious services							
Earthquake dummy	0.204	0.012	0.208	0.036	0.031	-0.017	0.034
	(0.326)	(0.053)	(0.179)	(0.064)	(0.042)	(0.027)	(0.047)
Earthq x Frequent earthq	0.030	0.032	0.013	0.009	0.021	0.059	0.025
	(0.078)	(0.091)	(0.081)	(0.077)	(0.085)	(0.052)	(0.079)
Earthq x development	-0.042	0.005	-0.045	-0.079	-0.145	0.137**	-0.040
	(0.068)	(0.005)	(0.032)	(0.175)	(0.143)	(0.063)	(0.024)
Observations	310	384	382	382	310	384	384
R-squared	0.529	0.516	0.521	0.514	0.541	0.518	0.515
Development	Inc	Light	Edu	Unempl	Agri	Pdens	Area
Baseline controls	Y	Y	Y	Y	Y	Y	Y

D Additional results for the epidemiological approach

Additional respondent level controls are included in Table A54: Religious denomination FE (variable rlgdnm) and whether or not the respondent classifies him or herself as belonging to the ethnic minority group in the current country of residence (variable blgetmg).[64]

Table A54. Main results including additional respondent level controls

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.:	pray	pray	relpers	relpers	service	service
Dist(earthquakes), 1000 km	-0.022**	-0.040***	-0.021***	-0.040***	-0.012	-0.028**
	(0.009)	(0.011)	(0.007)	(0.013)	(0.007)	(0.010)
Ethnic minority		0.106***		0.089***		0.065***
		(0.019)		(0.013)		(0.019)
Observations	9,965	16,395	10,035	16,498	10,073	16,563
R-squared	0.134	0.167	0.124	0.117	0.103	0.123
Country-year FE	Y	Y	Y	Y	Y	Y
Geo controls	Y	Y	Y	Y	Y	Y
Indl controls	Y	Y	Y	Y	Y	Y
Denomination FE	Y	N	Y	N	Y	N

Tables A55, A56, and A57 include additional controls at the country of origin level: Pct adherents to the major religious denominations, real GDP per capita in 2010, the polity IV measure from 2010, and a measure of property rights institutions from the Heritage Foundation (downloaded from the Quality of Government Institute).

[64] The denominations include Roman Catholic, Protestant, Eastern Orthodox, Other Christian denomination, Jewish, Islamic, Eastern religions, and Other non-Christian religions.

Table A55. Main results with additional country of origin controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. var.: Prayer outside religious services								
Dist(earthquakes), 1000 km	-0.032**	-0.041***	-0.043***	-0.041***	-0.043***	-0.043***	-0.043***	-0.040***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Percent Muslims	0.094***							
	(0.034)							
Percent Christians		-0.025						
		(0.036)						
Percent Jews			-0.008					
			(0.051)					
Percent Buddhists				-0.152*				
				(0.080)				
Percent Hindus					-0.024			
					(0.038)			
Real GDP per capita 2010						0.001		
						(0.005)		
Polity IV 2010							-0.002	
							(0.001)	
Property Rights								-0.000
								(0.000)
Observations	16,499	16,499	16,499	16,499	16,499	16,499	16,565	16,937
R-squared	0.163	0.162	0.162	0.162	0.162	0.162	0.159	0.159
Country-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Geo controls	Y	Y	Y	Y	Y	Y	Y	Y
Indl controls	Y	Y	Y	Y	Y	Y	Y	Y

Table A56. Main results with additional country of origin controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. var.: Religious person								
Dist(earthquakes), 1000 km	-0.030*	-0.038**	-0.042**	-0.041**	-0.042***	-0.042**	-0.042**	-0.043***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.015)	(0.013)
Percent Muslims	0.102***							
	(0.023)							
Percent Christians		-0.045						
		(0.033)						
Percent Jews			-0.076					
			(0.065)					
Percent Buddhists				-0.105				
				(0.064)				
Percent Hindus					-0.039			
					(0.038)			
Real GDP per capita 2010						0.004***		
						(0.001)		
Polity IV 2010							-0.003*	
							(0.002)	
Property Rights								-0.000
								(0.000)
Observations	16,609	16,609	16,609	16,609	16,609	16,609	16,674	17,050
R-squared	0.113	0.111	0.111	0.111	0.111	0.111	0.110	0.109
Country-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Geo controls	Y	Y	Y	Y	Y	Y	Y	Y
Indl controls	Y	Y	Y	Y	Y	Y	Y	Y

Table A57. Main results with additional country of origin controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. var.: Attendance at religious services								
Dist(earthquakes), 1000 km	-0.021*	-0.027*	-0.029**	-0.028**	-0.029**	-0.029**	-0.029**	-0.032***
	(0.012)	(0.013)	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)
Percent Muslims	0.068***							
	(0.020)							
Percent Christians		-0.033						
		(0.027)						
Percent Jews			-0.083**					
			(0.038)					
Percent Buddhists				-0.075*				
				(0.040)				
Percent Hindus					0.052**			
					(0.024)			
Real GDP per capita 2010						0.001		
						(0.005)		
Polity IV 2010							-0.002	
							(0.002)	
Property Rights								0.000
								(0.000)
Observations	16,674	16,674	16,674	16,674	16,674	16,674	16,734	17,114
R-squared	0.120	0.119	0.119	0.119	0.119	0.119	0.119	0.118
Country-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Geo controls	Y	Y	Y	Y	Y	Y	Y	Y
Indl controls	Y	Y	Y	Y	Y	Y	Y	Y

Tables A58, A59, and A60 show different categorizations of the measures of frequency of prayer outside religious services, degree of religiosity, and frequency of attendance at religious services apart from special occations. The categorizations follow the same structure as done in Section B.11 and C.11.1. Only prayer is robust to transforming the variable into a dummy variable equal to one for the top one or two categories, zero otherwise. Analogous to the analysis in Section B.11 and C.11.1, $intensive1$ sets the lowest category of the measures to missing. This exercise is stricter than above, as the variables measuring frequency of prayer and religious services already capture the intensive margin to some extent (prayer outside religious services and attendance at religious services apart from special occations). Earthquake risk does not affect prayer and churchgoing in this restricted sample. As an alternative measure of the intensive margin, $intensive2$, I exclude instead observations where the respondent has answered that he or she is not at all a religous person. In this sample, earthquake risk increases all three measures of religiosity.

Table A58. Main results with different categorizations of prayer

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.: Prayer outside religious services						
Dist(earthquakes), 1000 km	-0.044***	-0.022*	-0.039***	-0.060***	-0.017	-0.038***
	(0.012)	(0.012)	(0.013)	(0.014)	(0.012)	(0.013)
Observations	16,991	16,991	16,991	16,991	10,234	14,099
R-squared	0.159	0.110	0.123	0.105	0.124	0.152
Country-year FE	Y	Y	Y	Y	Y	Y
Geo controls	Y	Y	Y	Y	Y	Y
Indl controls	Y	Y	Y	Y	Y	Y
Pray measure	base	frequent1	frequent2	extensive	intensive1	intensive2

Table A59. Main results with different categorizations of religious person

	(1)	(2)	(3)	(4)	(5)
Dep. var.: Religious person					
Dist(earthquakes), 1000 km	-0.044***	-0.018	-0.022	-0.035***	-0.031**
	(0.014)	(0.011)	(0.014)	(0.012)	(0.014)
Observations	17,104	17,104	17,104	17,104	14,315
R-squared	0.109	0.037	0.058	0.054	0.101
Country-year FE	Y	Y	Y	Y	Y
Geo controls	Y	Y	Y	Y	Y
Indl controls	Y	Y	Y	Y	Y
Religiosity measure	base	very1	very2	extensive	intensive

The frequency of attending religious services was originally a variable running from 1="Never" to 7="Every day". Due to few observations in the latter category, I merged 7 and 6="More than once a week". The results using the original variable is shown in column (1) of Table A60. The baseline result is shown in column (2).

Table A60. Main results with different categorizations of churchgoing

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.: Attendance at religious services							
Dist(earthquakes), 1000 km	-0.024**	-0.029**	-0.006	-0.014	-0.054***	-0.009	-0.024*
	(0.010)	(0.011)	(0.009)	(0.013)	(0.016)	(0.011)	(0.013)
Observations	17,168	17,168	17,168	17,168	17,168	10,954	14,245
R-squared	0.116	0.117	0.052	0.093	0.089	0.129	0.115
Country-year FE	Y	Y	Y	Y	Y	Y	Y
Geo controls	Y	Y	Y	Y	Y	Y	Y
Indl controls	Y	Y	Y	Y	Y	Y	Y
Service measure	org	base	frequent1	frequent2	extensive	intensive1	intensive2

The country of origin in Table 5 was the mother's country of origin unless the country of origin was missing, where the father's country of origin was used. Instead, Table A56 uses the father's country of origin at the outset, but uses the mother's country of origin

when information for the father is missing. The same results emerge.

Table A61. Main results with focus on the father's country of origin

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:		pray			religious			service	
Panel A. The simple linear effect									
Dist(earthquakes), 1000 km	-0.049***	-0.036***	-0.026*	-0.055***	-0.041***	-0.029**	-0.040***	-0.025**	-0.018
	(0.015)	(0.012)	(0.014)	(0.019)	(0.013)	(0.014)	(0.014)	(0.011)	(0.011)
Observations	17,078	16,983	14,138	17,190	17,095	14,231	17,251	17,155	14,284
R-squared	0.122	0.130	0.174	0.074	0.087	0.130	0.101	0.111	0.127
Org countries	170	165	154	170	165	154	170	165	154
Panel B. Adding a squared term of disaster distance									
Dist(earthquakes), 1000 km	-0.129***	-0.075**	-0.068**	-0.119***	-0.056*	-0.047	-0.084***	-0.033	-0.025
	(0.022)	(0.033)	(0.032)	(0.028)	(0.032)	(0.032)	(0.028)	(0.022)	(0.023)
Dist(earthq) squared	0.049***	0.023	0.025	0.039***	0.009	0.010	0.027**	0.005	0.004
	(0.010)	(0.017)	(0.019)	(0.013)	(0.017)	(0.020)	(0.013)	(0.012)	(8.135)
Observations	17,078	16,983	14,138	17,190	17,095	14,231	17,251	17,155	14,284
R-squared	0.123	0.130	0.175	0.075	0.087	0.130	0.101	0.111	0.127
Impact at 500 km	-0.104	-0.0637	-0.0558	-0.0996	-0.0512	-0.0419	-0.0706	-0.0308	-0.0232
Panel C. Excluding countries of origin in high-risk zones									
Dist(earthquakes), 1000 km	-0.041***	-0.036***	-0.023*	-0.047**	-0.040***	-0.028*	-0.034**	-0.025**	-0.018*
	(0.015)	(0.012)	(0.013)	(0.018)	(0.012)	(0.014)	(0.013)	(0.010)	(0.010)
Observations	15,717	15,714	9,347	15,820	15,817	9,389	15,881	15,878	9,415
R-squared	0.105	0.112	0.159	0.062	0.073	0.122	0.093	0.102	0.126
Org countries	138	135	120	138	135	119	138	135	120
Country-year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Geo controls	N	Y	Y	N	Y	Y	N	Y	Y
Indl controls	N	N	Y	N	N	Y	N	N	Y

Table A62. Main results including individual income fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	pray		religious		service	
Dist(earthquakes), 1000 km	-0.038**	-0.037**	-0.041**	-0.041**	-0.025**	-0.025**
	(0.014)	(0.014)	(0.016)	(0.016)	(0.012)	(0.011)
Observations	12,030	12,030	12,076	12,076	12,116	12,116
R-squared	0.161	0.166	0.115	0.119	0.128	0.129
Country-year FE	Y	Y	Y	Y	Y	Y
Geo controls	Y	Y	Y	Y	Y	Y
Indl controls	Y	Y	Y	Y	Y	Y
Indl income fixed effects	N	Y	N	Y	N	Y
Org countries	161	161	161	161	161	161

Notes. Columns (1), (3), and (5) replicate the corresponding columns in Panel A of Table 5, but restricted to the sample with information on individual income. Columns (2), (4), and (6) include individual income fixed effects.

The measure of prayer measures the degree of prayer outside religious services. Table A61 shows that results hold to controlling for attendance at religious services and also when allowing the impact of earthquake risk to vary with the degree of churchgoing.

Table A63. Main result for prayer outside religious services interacted with churchgoing

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Prayer outside religious services					
Dist(earthquakes), 1000 km	-0.050***	-0.017***	-0.028***	-0.029***	-0.028***
	(0.014)	(0.005)	(0.009)	(0.008)	(0.008)
Attendance at religious services		0.803***	0.783***	0.773***	0.775***
		(0.014)	(0.020)	(0.020)	(0.022)
Dist(earthquakes) x attendance			0.040	0.049*	0.025
			(0.026)	(0.026)	(0.026)
Observations	17,155	17,107	17,107	17,010	16,945
R-squared	0.122	0.444	0.445	0.445	0.464
Country-year FE	Y	Y	Y	Y	Y
Geo controls	N	N	N	Y	Y
Parent and respondent controls	N	N	N	N	Y

The estimates of Table A62 show the level of religiosity of the child of immigrants regressed on the level of religiosity in his/her parents' home country, where the latter is calculated as the country average across all waves of the WVS-EVS in Panel A, while the measure of religiosity in Panel B is calculated in 1990 or before. The precision of estimation increases in the latter case, which is consistent with the idea that most immigrants had probably left their home country by 1990. Thus measuring religiosity in the home country after 1990 might bias the results.

Table A64. OLS estimates of respondent religiosity on average religiosity in parents' home country

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:		pray			religious			service	
Panel A. Full sample									
Intrinsic Religiosity Scale	0.150***	0.115***	0.080**	0.130***	0.085**	0.055	0.109***	0.062*	0.046
	(0.034)	(0.036)	(0.032)	(0.035)	(0.035)	(0.034)	(0.039)	(0.031)	(0.030)
Observations	15,072	14,975	12,517	15,175	15,078	12,602	15,236	15,138	12,653
R-squared	0.137	0.142	0.194	0.078	0.085	0.129	0.112	0.120	0.138
Org countries	78	74	73	78	74	73	78	74	73
Panel B. Religiosity before 1990									
Intrinsic Religiosity Scale	0.170***	0.137***	0.103**	0.165***	0.121***	0.108***	0.182***	0.100***	0.067**
	(0.044)	(0.048)	(0.048)	(0.040)	(0.025)	(0.035)	(0.036)	(0.016)	(0.025)
Observations	8,453	8,453	7,097	8,533	8,533	7,161	8,562	8,562	7,183
R-squared	0.123	0.124	0.192	0.056	0.058	0.107	0.120	0.123	0.151
Org countries	24	24	24	24	24	24	24	24	24
Country-year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Geo controls	N	Y	Y	N	Y	Y	N	Y	Y
Parent and indl controls	N	N	Y	N	N	Y	N	N	Y

Notes. The table replicates panel A of Table 5, using the Strength of Intrinsic Religiosity Scale in the parents' home country instead of earthquake frequency. Both panels include controls for WVS-EVS respondents' sex, age, age squared, marital status, and year of interview. Panel A calculates the Strength of Intrinsic Religiosity Scale across all waves of the WVS-EVS, while Panel B restricts the sample to the countries measured in 1990 or before.

The earthquake risk measure in Table 5 aggregates within-country variation in earthquake risk. This potential bias is likely to be larger the larger the country of origin, since the likelihood that parents migrate from different areas in a country is larger. Therefore, the size of the bias can be estimated by investigating whether the effect of earthquake risk depends on the size of the country. This does not seem to be driving the results: Restricting the sample to the 75 or 90% smallest countries produces similar results.

Table A65. Main results excluding the smallest countries of origin

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable		pray			religious			service	
Panel A. Full sample excluding areas>90th percentile									
Dist(earthq), 1000 km	-0.046***	-0.040***	-0.034***	-0.054***	-0.045***	-0.038***	-0.036**	-0.029**	-0.024**
	(0.015)	(0.011)	(0.011)	(0.018)	(0.013)	(0.013)	(0.016)	(0.012)	(0.011)
Observations	13,692	13,595	11,245	13,753	13,656	11,294	13,811	13,713	11,344
R-squared	0.120	0.130	0.179	0.082	0.097	0.143	0.105	0.118	0.137
Org countries	159	154	143	159	154	143	159	154	143
Panel B. Full sample excluding areas>75th percentile									
Dist(earthq), 1000 km	-0.043***	-0.044***	-0.040**	-0.049***	-0.047***	-0.042***	-0.027**	-0.030**	-0.029**
	(0.013)	(0.012)	(0.015)	(0.014)	(0.012)	(0.013)	(0.013)	(0.013)	(0.012)
Observations	12,230	12,133	10,014	12,280	12,183	10,055	12,340	12,242	10,105
R-squared	0.106	0.116	0.166	0.074	0.087	0.130	0.098	0.110	0.126
Org countries	136	131	122	136	131	122	136	131	122
Country-year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Geo controls	N	Y	Y	N	Y	Y	N	Y	Y
Parent and indl controls	N	N	Y	N	N	Y	N	N	Y

Notes. The table replicates panel A of Table 5, excluding countries of origin with areas larger than the 90th percentile in Panel A and the 75th percentile in Panel B.