

Does Political Violence Increase Religiosity? A Multilevel Analysis of 71 Countries

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Abstract

A large social science literature demonstrates that high levels of societal health correlate with low levels of religiosity. Societies that are more developed, literate, and free from disease tend to be less religious. One of the most fundamental threats to an individual is the risk of political violence, but this important marker of societal health has been unexplored in studies of the determinants of religiosity. Using data on political violence and religious beliefs and practices in 71 countries during the period 1981-2011, we find a robust positive relationship between political violence and religiosity. We offer several reasons to believe that this is a causal relationship. Drawing on psychological studies, we argue that the specific mechanism at work deals with religious coping, a uniquely efficacious way of combating the stress and anxiety produced by the threat of recurrent violence.

In the 16th century the French priest and theologian John Calvin noticed a link between the increasingly comfortable lifestyles of Genevans and a decline in church attendance (Dennett, 2015). Contemporary social science research has borne out his insight some five hundred years later. Scholarship over the past decade finds increases in levels of ‘societal health’ correlate with declines in religiosity. In a broad and ambitious study, Norris and Inglehart (2004: 4) argue that existential security – “the feeling that survival is secure enough that it can be taken for granted” – reduces religiosity. Using data from roughly 80 countries, they find that factors associated with socioeconomic development such as high incomes, high literacy rates, freedom from disease, etc. correlate with low levels of religiosity. A number of other studies find similar outcomes. Gill and Lundsgaarde (2004) show that state welfare spending reduces religiosity. Zuckerman’s (2008) study of Scandinavia finds that high levels of societal health leads Danes and Swedes to abandon religion almost wholesale. Rees (2009) demonstrates that income equality reduces religiosity.

In this article, we build on existing literature by focusing on a surprisingly neglected measure of societal health – the level of political violence – and its effect on religiosity. To our knowledge, there is no rigorous statistical test of the effect of political violence on religiosity around the world.ⁱ This is an important oversight because violence is one of the more fundamental and immediate threats to individual and group well-being. We hypothesize that individuals living in violent political environments express more intense religious beliefs and are more likely to attend religious services than those who live in peaceful environments. We believe the specific mechanism at work in this relationship relates to religious coping. Religion offers psychological, physiological, and social benefits to individuals during times of severe stress and anxiety, and these religious benefits have been shown to be more efficacious than other forms of

(non-religious) coping. Therefore, we argue that individuals use religion to cope with the strain induced by a pervasive and recurrent threat of violence.

Our theory can be broken down into two parts. First, there is ample evidence that violence increases stress and anxiety, thus generating the need for coping mechanisms. This component of the theory is based on a large psychological literature on the causes of stress, including the study of post-traumatic stress disorder (PTSD).ⁱⁱ One branch of this research focuses on the impact of violence specifically, finding that individuals and societies under the threat of constant violence tend to have more psychosocial problems, including anxiety, feelings of vulnerability, depression, and suicide risk (Ozer, Best, Lipsey, & Weiss, 2003).

The second part of our theory is premised on the fact that religion offers a unique form of coping with life stressors (Pargament, 1997). The importance of religious coping can be found in many religious texts and across almost all religious traditions. Classical Western thinkers from the 19th and 20th centuries like Karl Marx (1843) and Sigmund Freud (1927) highlight (albeit often in derogatory ways) the importance of religion as a means of providing comfort to people dealing with harsh realities. Modern psychologists have repeatedly demonstrated that religion can increase the well-being of those in challenging life circumstances (Ano & Vasconcelles, 2005), and that religious coping is more efficacious than non-religious coping.

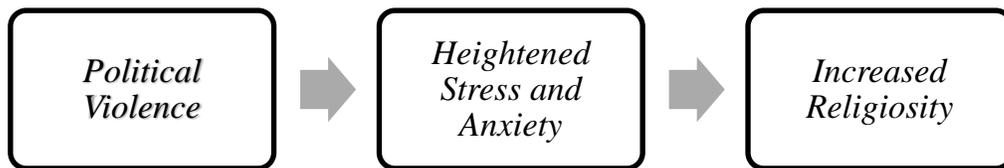
We assess this hypothesized relationship between political violence and religiosity using data on political violence from the Political Terror Scale, which combines indexes of violence from Amnesty International, the U.S. State Department, and Human Rights Watch. We use data on two measures of religiosity (religious beliefs and practices) from the World Values Survey (WVS) covering 71 countries over the period 1981-2011. Using hierarchical models that control for various potential confounders at the individual-, country-year (survey), and country-level, we

find a consistent positive relationship between political violence and religiosity. We offer several reasons why we believe this is a causal relationship. This result is also robust to the inclusion of alternative measures of political violence from the Physical Integrity Index in the Cingranelli-Richards (CIRI) Human Rights dataset, as well as supplemental religiosity data from the 2008 International Social Survey Programme (ISSP).

The paper proceeds as follows. First, we present our theoretical framework regarding the link between violence, stress, and religiosity. Second, the research design and the empirical strategy used in the article are discussed before the main findings are presented. The penultimate section discusses a series of additional analyses that were conducted to assess the robustness of our results. The final section discusses some of the key implications of our study and concludes.

Theory: Violence, Stress, and Religiosity

In this section, we detail a theory linking violence, stress, and religiosity. This theory can be diagrammed simply as follows:



The first component of our theory posits that political violence is a major cause of stress and anxiety. We focus specifically on violence initiated by the state against its own citizens (state-sponsored violence). This definition includes killings, torture, disappearances, and political imprisonment, but excludes forms of ‘contentious politics’ or wars between states.

This argument is grounded in the voluminous psychological literature on the causes of stress. We argue that violent societies have higher levels of stress and anxiety on average than nonviolent societies; and, that there is an additive effect of these psychosocial problems in certain societies where the threat of violence is pervasive, indeterminate, and recurrent. Both of

these arguments are empirically supported by a variety of psychological studies, especially many studies on PTSD.

The term PTSD first entered the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) in its third iteration in 1980 (Brewin, Andrews, & Valentine, 2000: 749). It is defined as “a psychiatric condition that can occur in anyone who has experienced a life-threatening or violent event” (Shiromani et al., 2009: 1). Four major symptoms of PTSD include: reliving the event that caused trauma, avoiding situations that remind one of the event, negative changes in beliefs and feelings, and hyperarousal.ⁱⁱⁱ The initial impetus for the growth of research into PTSD was the major wars of the 20th century. Waves of interviews and clinical studies with World War II, Korean War, and Vietnam War combat veterans repeatedly found high levels of stress, fatigue, and anxiety (Ozer et al., 2003). Since that time, other forms of violence have been studied as additional causes of PTSD: for example, intimate partner violence and sexual violence (Dutton et al., 2006; Golding, 1999).

There are two important caveats to note about PTSD. First, the ‘trauma’ referenced in the term can refer to a wide variety of incidents, including nonviolent traumas such as a cancer diagnosis or the death of a loved one. Second, most individuals who experience a traumatic event do not develop PTSD. According to studies, only roughly 8% of the US population suffers from PTSD (Ozer et al., 2003: 54). While PTSD is not a common affliction, it is more common among certain populations, such as veterans, women, refugees, and immigrants. Our argument here is not that all individuals in violent societies develop PTSD and therefore become more religious, only that stress, anxiety, and PTSD are more likely to develop in violent environments.

Studies show that people who live in violent societies tend to have higher levels of stress and anxiety than those who do not. A study involving immigrants from Central America and

Mexico found that those subgroups trying to escape conflict had higher levels of PTSD than those emigrating for other reasons (Cervantes, Salgado de Snyder, & Padilla, 1989). A study among Cambodian refugees shows that this group experiences high levels of PTSD (Carlson & Rosser-Hogan, 1993). Another study of Bosnian refugees found similar effects, and also noted that PTSD declined over time among this community after they emigrated to a more peaceful country (Weine et al., 1998). Within country comparisons suggest a particularly important role for political violence: survivors of the Oklahoma City bombing in 1994 experienced PTSD at significantly higher rates than those who survived the California earthquake in Northridge in 1995 (Meisenhelder, 2002: 772).

We also argue that there is an additive or cumulative effect to violence: people who experience more than one traumatic event experience stress and anxiety at higher levels than those who experience only one traumatic event. Several studies of recurrently violent societies show their populations experience more stress than the populations of nonviolent or less violent nations. Empirical examples can be found in many parts of the world. One popular region for research is Israel-Palestine, home to one of the longest-running conflicts in history. Hirsch-Hoefler et al. (2016) find that repeated violence, such as the constant threat of rocket attacks in Israel, triggers anxiety in the population. Canetti et al. (2014) find that repeated exposure to rocket attacks leads not only to higher levels of stress, but also long-term autoimmune disorders. Research in other conflict-prone countries confirms these results. Baker et al. (2005) find that over one-tenth of the population of Mexico, a country with a “lifetime prevalence of violence,” experiences PTSD. Even developed countries are not immune – incidents of stress and anxiety rose sharply in the United States after the September 11th attacks (Schuster et al., 2001).

The second component of our theory is that religiosity offers a special form of coping with the stressors induced by violence. Religiosity is a broad and often nebulous concept, but we focus on two central components: religious beliefs, such as belief in spiritual beings, and religious practices, such as attendance at religious services. Following Pargament (1997), we note that religion is about more than simply coping. Millions of people who do not live in adverse circumstances choose to be religious. Similarly, there are many types of nonreligious coping. Individuals can utilize a number of coping mechanisms that have nothing to do with religion in order to deal with life stressors, including both positive mechanisms (meditation and exercise) and negative mechanisms (alcohol and drug abuse). However, we argue in this section that religion is a unique coping mechanism, one that many studies have found to be more helpful than other coping mechanisms in times of stress.

The concept of religious coping emerges from many religious texts themselves, which often specifically reference how God, spiritual beings, or members of the religious community will help individuals in difficult circumstances. Textual evidence exists for this claim in a number of traditions. Many of Christ's words in the New Testament are targeted toward vulnerable populations, including the poor,^{iv} criminals,^v and prostitutes.^{vi} One of the five pillars of Islam is *zakat*, or alms giving. A central practice of Sikhism revolves around the *langar* (kitchen), which provides free food to any visitor (including non-Sikhs) of a *gurudwara*.

How does religion specifically facilitate coping with stress? We highlight distinct psychological, physiological, and social benefits. Many classical western thinkers argued for the psychological benefits of religious coping, although often in rather bleak terms. Marx (1843) wrote that "Religion is the sigh of the oppressed creature, the heart of a heartless world, and the soul of soulless conditions. It is the opium of the people." Freud (1927) argued that religion was

grounded in man's need to create a heavenly father, and he famously described religion as the "universal obsessional neurosis of humanity." A decidedly less contentious view from contemporary psychologists is that religion helps individuals psychologically during times of stress because it allows people to make sense of traumatic events (i.e. it was God's will) and gives them an opportunity to petition deities for help (i.e. prayer or *puja*).

A second way that religion facilitates coping is through physiological benefits. Many studies show that those closer to death such as the elderly or terminally ill are more religious than the average population (Allport, 1950; Jung, 1933; Koenig & Larson, 2001). Religiosity among these groups has been linked to lower rates of depression, faster remission of disease, and lower rates of cardiovascular illnesses and cancers (Payman, George, & Ryburn, 2008).

A final way that religion facilitates coping is that during times of anxiety and stress, religion can provide important social networks to ease suffering. This view draws on Durkheim's conception of religion (1912), which is as a primarily social institution. In times of severe stress and anxiety, people can draw on their religious communities (churches, mosques, synagogues, etc.), rely on religious charities, and can feel a sense of kinship with like-minded individuals of the same faith.

Our second point is that, compared to other kinds of coping mechanisms, religion has been shown to be a better stress reducer, especially when it comes to the threat of violence. Studies indicate that religious coping is most effective among more vulnerable populations – in the American context, for example, among the less-educated and the African-American community. Other studies show that the more serious a life stressor is, the stronger the relationship between religiosity and well-being (Bulman & Wortman, 1977; Conway, 1985; Pargament, Tarakeshwar, Ellison, & Wulff, 2001). Bleich, Gelkopf, and Solomon's (2003: 617)

study of violence and stress in Israel finds that respondents in the survey who were subjected to over a year of terrorism considered “faith in God” one of the most helpful modes of coping.

Thus far we have focused on implicitly positive forms of religious coping. But not all religious coping is positive – studies have also begun to analyze the possibility of “negative religious coping” (Pargament, Smith, Koenig, & Perez, 1998). Negative religious coping includes “punitive religious appraisals, demonic reappraisals, spiritual discontent, [and] self-directing coping efforts” (Ward, 2010: 7) – in short, questioning one’s faith or being angry at God in times of crisis. Although there is very little systematic research into comparing positive and negative religious coping, a few existing studies show that positive religious coping is much more prevalent. One study of women with stage IV breast cancer found that those who used positive religious coping ‘a moderate amount’ of time or ‘a lot’ accounted for 76% of the sample, compared with women who used negative religious coping ‘a little’ as 15% of the sample (Hebert, Zdaniuk, Schulz, & Scheier, 2009). Another study of persons with persistent mental illnesses found that the most popular forms of religious coping were all positive mechanisms, such as prayer, attending religious services, and worshipping God (Tepper, Rogers, Coleman, & Malony, 2001: 662).

Drawing on a large psychological literature, we find that violent societies produce heightened stress and anxiety, and that religious coping is a uniquely efficacious way to lower these psychosocial problems. This suggests that individuals who live in violent societies will turn to religion as a coping mechanism. In the next section, we statistically test this hypothesized relationship.

Data and Methods

Data for the empirical analysis are drawn from the first six waves of the World Values Survey (WVS; all surveys between 1981 and 2011 are included in the sample). The WVS consists of nationally representative surveys conducted in almost 100 countries that contain almost 90 percent of the world's population. The surveys use a common questionnaire and execute rigorous, high quality research designs in each country.^{vii} The WVS is the largest cross-national, time series investigation of human beliefs and values ever executed. The sample used in this paper includes interviews with 250,983 respondents from surveys conducted in 71 countries over a period of twenty years.

The World Values Survey is ideal to address the research question in this paper because it includes since the first wave several questions that measure respondents' religious beliefs and religious practices. The surveys also include a battery of relevant sociodemographic covariates. Another advantage of the WVS for the purposes of our analysis is that it has broad geographical coverage. The countries included in the WVS range from very poor to very rich, and all the world's major cultural zones are represented. More importantly, the sample includes countries that range from very low to very high levels of political violence. This allows us to have significant variation in our key independent variable (state-sponsored political violence).

In this study, the influence of political violence on religiosity will be analyzed by looking at two different facets of religiosity: 1) personal beliefs in the importance of God, and 2) frequency of religious attendance. These two dimensions of religiosity also capture two possible forms of religious coping. Individuals can react to security threats in their environment by becoming more spiritual, and by attributing a more important place to God in their daily life. But religiosity also has an important social dimension, as explained earlier. Attending religious services can help individuals cope with a violent environment because of the spiritual messages

that are conveyed during the service, but also because they might feel more secure when they are immersed in large and rich social networks. Two survey items from the WVS will be used as the main dependent variables in the empirical analysis, capturing these two facets of religiosity.

These variables are described in Table 1.

[TABLE 1 ABOUT HERE]

The key independent variable in the analysis is political violence, and in particular state-sponsored political violence. In order to measure political violence, we use the Political Terror Scale, a scale which measures levels of state-sponsored political violence that a country experiences in a particular year based on a 5-level “terror scale” originally developed by Freedom House. The “terror” in the PTS refers to state-sponsored killings, torture, disappearances, and political imprisonment. The information used in creating this index comes from three different sources: the yearly country reports of Amnesty International, the U.S. State Department Country Reports on Human Rights Practices, and Human Rights Watch’s World Reports (Gibney, Cornett, Wood, Haschke, & Arnon, 2016; Wood & Gibney, 2010).^{viii} The five PTS levels are listed and described in Table 2.

[TABLE 2 ABOUT HERE]

The empirical models also include a battery of control variables that are traditionally associated with religiosity. At the individual level, several sociodemographic variables have been linked with religious beliefs and religious attendance. First, several studies show that women have a stronger religious commitment and attend religious services more frequently than men (Argyle & Beit-Hallahmi, 2013; Batson, Schoenrade, & Ventis, 1993). Second, it has been demonstrated that older adults tend to be more religious because religion helps them find meaning in their lives and cope with end of life situations (Cohen & Koenig, 2003; Shaw,

Gullifer, & Wood, 2016). Third, the link between education and individual religiosity has been the subject of considerable attention in the literature. While several studies have shown a positive association between education and religiosity (Brañas-Garza & Neuman, 2004; Brown & Taylor, 2007), other research suggests that there is a negative relationship between education and religiosity (Hungerman, 2014; Iannaccone, 1992). Finally, a number of studies suggest that high incomes discourage religiosity, and in particular religious attendance (Azzi & Ehrenberg, 1975; Lipford & Tollison, 2003). All these variables are described in Table 1, and summary statistics are presented in Appendix 1.

Finally, the models also include a series of country-level factors that have been shown to influence the level of societal religiosity. One of the most robust findings in the secularization literature is that economic development and modernization lead to a decrease in religiosity (Norris & Inglehart, 2004). In the analysis below, we include a measure of logged GDP per capita, which is traditionally used in cross-national studies as a proxy for economic development. The GDP data was obtained from the World Bank Development Indicators.^{ix} While the literature suggests that economic development affects the “demand” for religion, other studies focus on supply-side factors that can influence the level of religiosity in different societies. In particular, these works argue that religious freedoms and religious pluralism generate competition in the religious “marketplace” and lead to higher levels of religiosity (Finke & Stark, 2000; Warner, 1993). On the contrary, the supply of religiosity might decline when the state recognizes only one religion as the “state religion” and supports that religion through government subsidies and regulation (Stark & Iannaccone, 1985).

We control for these supply-side factors by including three variables in the statistical analysis. First, we include a measure of states’ acceptance of religious freedoms coming from the

Cingranelli-Richards (CIRI) Human Rights dataset (Cingranelli, Richards, & Clay, 2014). This variable measures the extent to which the freedom of citizens to exercise and practice their religious beliefs is subject to government restrictions. The variable is trichotomous (0 = severe restrictions, 1 = moderate restrictions, 2 = no restrictions). Second, we control for religious pluralism by including in our models a widely used measure of religion fractionalization (Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003). This measure goes from 0 to 1, and a higher number indicates a more fractionalized society. Third, we use a dummy variable from the Religion and State Project Constitutions Dataset (Fox, 2011) which is coded as 1 if there is an EOR (Establishment of Religion) clause in the constitution declaring one religion as the official state religion, and 0 otherwise.

Finally, it is possible that patterns of religiosity differ among different religious groups (Barro & McCleary, 2003). Hence, we include in the statistical models a series of dummy variables for each major religion present in the dataset. All countries are given a value of 1 for the religion that predominates in their society, and 0 for all other religions.^x Catholicism was not included in the models, and therefore serves as the reference category in the analysis.

Model Estimation

The empirical models in this paper apply multilevel techniques that distinguish between three levels, i.e. the individual level, the country-year (survey) level, and the country level. The multilevel approach takes the layered character of our data into account. Many of the variables used in the analysis capture individuals' sociodemographic characteristics (age, sex, education, and income). These individuals are nested within surveys, and some contextual variables (e.g. the PTS scale or the HDI index) vary within countries from survey to survey. Other contextual variables that affect religiosity (e.g. the level of religious pluralism) tend to be much more stable

over time. Hence, there are three nested levels in the analyses below: individuals, country-years (surveys), and countries.

Multilevel models are quickly becoming standard in political science (Snijders & Bosker, 1999) and are usually estimated using either Bayesian simulations or quasi-likelihood methods (Goldstein, 1995). The most important feature of these models for the purpose of this article is that the estimates of variances and their associated standard errors provide direct tests of the impact of measured contextual effects on religiosity. Hierarchical models also allow for a more precise estimation of individual-level factors because they control for important contextual factors that may bias the results (Gelman & Hill, 2006; Steenbergen & Jones, 2002). Therefore, this analysis proceeds using a series of multilevel models; more specifically, we estimated mixed effects random intercept models.

Results

Table 3 presents eight multilevel models estimating religiosity at the individual level. Two different forms of religiosity are analyzed: belief in the importance of God and attendance at religious services. Three types of models are considered for each dependent variable: 1) a simple hierarchical model with no control variables, 2) a hierarchical model with individual-level control variables (age, sex, education, and income), and 3) a hierarchical model with all relevant control variables at the individual and contextual level. Models 4 and 8 replicate the results of the main models (Models 3 and 7) but drop all Middle Eastern observations, and will be discussed in the next section.

[TABLE 3 ABOUT HERE]

The results provide strong support for the theoretical intuitions of this paper. As expected, all the coefficients measuring the effect of state-sponsored violence (PTS scale) on religiosity are positive and statistically significant. In other words, the results suggest that

individuals living in countries with high levels of political violence are more likely to hold religious beliefs and to attend religious services than respondents living in states with low levels of political violence. This result appears to be robust to different model specifications.

In order to visualize how substantively important these effects are, we estimated the marginal effects of political violence on the two different forms of religiosity. These marginal effects were estimated on the basis of the results of the full models (Models 3 and 7), and all other variables were held at their mean values. Figure 1 presents the marginal effects of political violence on respondents' religious beliefs, and Figure 2 presents the marginal effects of political violence on religious attendance.

[FIGURES 1 AND 2 ABOUT HERE]

Figure 1 suggests a sustained increase in religious beliefs as the level of state-sponsored political violence increases. There is an increase of 0.77 in the 1-10 "importance of God" scale when the PTS scale moves from 1 (low level of political violence) to 5 (high level of political violence). In other words, individuals become more religious as the level of political violence in their environment increases in order to cope with the psychological distress generated by state violence. Figure 2 shows a similar effect of state-sponsored political violence on religious attendance. As in the previous figure, the marginal effects suggest a sharp increase in religious attendance as the level of political violence increases. In fact, there is a marked increase of 0.92 in the 1-7 "religious attendance" scale when the PTS scale moves from 1 (low level of political violence) to 5 (high level of political violence).

As for the control variables, the results show again that age and sex are key determinants of religiosity. Women and older people are more likely to hold religious beliefs and to attend religious services. This result points in the expected direction: according to the psychological

literature we discussed earlier, these groups are more likely to both experience PTSD and utilize religious coping. The effect of education depends on the specific form of religiosity being considered. Our results suggest that more educated individuals are less likely to hold religious beliefs, but more likely to attend religious services. This result is in line with previous findings in the US context (Glaeser & Sacerdote, 2008). Finally, we find much stronger support for demand-side explanations of religiosity than for supply-side factors. As previous research has demonstrated (Norris & Inglehart, 2004), the level of development is negatively associated with religiosity. In fact, the coefficient for the variable measuring GDP per capita is negative and statistically significant in Models 3 and 7. By contrast, none of the variables capturing supply-side factors (religious freedoms, EOR clause in the constitution, and religious fractionalization) have a statistically significant effect on religiosity.

Is State-Sponsored Political Violence Endogenous to Religiosity?

While we have argued that high levels of political violence affect people's religiosity, the reverse causal direction is also plausible. Religiosity may drive state-sanctioned violence against citizens and not the other way around. For example, one study shows that religion legitimizes state violence in countries such as Iran or Israel (Lusthaus, 2011). There are, however, good reasons to doubt the generalizability of that argument – state violence has been used repeatedly during the past century for non-religious reasons, i.e. to impose ideological and political control over a country's population. For instance, Communist one-party regimes in Asia and Eastern Europe, Sultanistic regimes in Africa, and military regimes in Latin America have all used political violence against their populations but those regimes did not act in the name of religion and did not seek religious legitimation. In other words, there is no obvious relationship going from religiosity at the societal level to state violence.

Still, the possibility of reverse causality demands consideration. Ideally, we would like to randomly attribute values of state-sponsored violence to different countries, but this is obviously impossible. One possible approach would be to find a valid instrument that induces changes in the explanatory variable (political violence) but has no independent effect on the dependent variable (religiosity). However, there are no obvious instrumental variables that would fulfill both requirements and, to our knowledge, the existing literature has not provided a good instrument to proxy for state-sponsored violence.

Despite the impossibility of quasi-experimental or instrumental approaches, we do not think our results are endogenous. First, the link between religion and political violence would have to operate at the macro level, while we are using individual-level data. Individual religiosity cannot cause state violence unless individual religious expression is somehow threatening to the state (e.g. when a country is sectarian and does not tolerate all religious beliefs). The inclusion of relevant country controls mitigates the possibility of endogeneity in this regard. Freedom of religion and religious pluralism might indicate a permissive state that is unlikely to violently repress religious minorities or religious expression of any kind. On the other hand, a state with an EOR might be more likely to use violence against religious “deviants.”

Second, we conducted additional analyses re-estimating the main results of the paper (presented in Table 3) but dropping all Middle Eastern countries, where most examples of religiously-motivated terror occur. If the relationship between state-sponsored violence and religiosity is endogenous, the coefficients measuring political violence should become statistically insignificant (or at least decrease in magnitude) when we drop Middle Eastern cases from the sample. Our results indicate the opposite. In Models 4 and 8 in Table 3 (which drop all Middle Eastern cases), the coefficients for the variables measuring state-sponsored violence

remain statistically significant and the magnitude of the coefficients slightly increases. In sum, while the data we use do not allow us to completely rule out the possibility of reverse causality, we are confident that the results presented in this paper capture a real effect of political violence on religious beliefs and religious attendance.

Robustness Checks

The results presented so far suggest that state-sponsored political violence leads to higher levels of religiosity. But these results were obtained using one specific index of political violence and one specific survey dataset. This section discusses the robustness of these results when another measure of state-sponsored violence is used (the CIRI Physical Integrity Index) and when another survey database is used (the 2008 wave of the International Social Survey Programme).

The first robustness test we conducted replicated the results using an alternative measure of state-sponsored political violence. The only other comparable scale of state-sponsored political violence of which we are aware is the Physical Integrity Index in the Cingranelli-Richards (CIRI) Human Rights dataset (Cingranelli et al., 2014). This is an additive index constructed with information from other variables in the CIRI dataset (measures of disappearance, extrajudicial killings, political imprisonment, and torture). The Physical Integrity Index ranges from 0 (no government respect for these four rights) to 8 (full government respect for these four rights), but for the purpose of this analysis the index was reversed so that a higher number means more political violence (as in the PTS scale). This index measures state-sponsored political violence by looking at the same indicators considered by the team coding the PTS scale, but the codification is very different.

We estimated the exact same models reported in Table 3 using this alternative measure of political violence, and the results were exactly the same. These models are presented in the

Appendix (Table A2). In line with the main argument in this paper, the coefficients measuring the effect of state-sponsored violence (Physical Integrity Index) on religiosity are positive and statistically significant in all the models.

The second robustness test we conducted replicated the results using an alternative survey database to measure religiosity at the individual level. We used the 2008 wave of the International Social Survey Programme. The ISSP is a continuing annual program of cross-national collaboration on surveys covering topics important for social science research. The topics covered change every year. In 2008, ISSP surveys focused on measuring religious beliefs and attitudes toward religious practices. The sample used to conduct this additional robustness test includes interviews with 59,986 respondents from surveys conducted in 44 countries. In the statistical analysis, we used four alternative measures of religiosity because the questions asked in the WVS were not available. Two of the ISSP survey items capture religious beliefs, while the other two capture frequency of religious attendance. The variables used in the analysis are described in Table 4.

[TABLE 4 ABOUT HERE]

These robustness analyses estimated the impact of state-sponsored violence on different dimensions of religiosity using the ISSP survey. As in the previous analyses, we estimated models with different specifications (no controls, individual-level controls, all controls) and with different measures of political violence (the PTS scale and the CIRI Physical Integrity Index). The results of these models are reported in Appendices 3 and 4. The models provide very strong support for the theoretical intuitions driving this paper. The coefficients measuring the effect of state-sponsored violence on religiosity are positive and statistically significant in the 24 models estimated with the 2008 wave of ISSP surveys.

In sum, all the additional robustness analyses we conducted point in the same direction. The results reported in this paper are not an artifact of the way we measure our main dependent and independent variables. Two different measures of state-sponsored violence were used with identical results. Similarly, religiosity was measured with six different variables from two different rigorous and well-respected cross-national survey datasets, and the results did not change. Finally, all these models were estimated with different specifications and the main findings of the paper did not vary. The next section will discuss these findings and present some important implications of these results.

Conclusion

A large body of recent social science literature has shown that high societal health reduces religiosity. States around the world that have higher incomes, literacy rates, and better health outcomes tend to be less religious. One overlooked metric of a healthy society, however, is low levels of violence. Violence is one of the most immediate and fundamental threats to well-being. In this article, we have provided the first rigorous empirical test of the argument that violence is positively associated with religiosity around the world.

Our argument is built around two premises, both of which have ample support from psychological studies. The first is that violence increases stress and anxiety. This argument comes from psychological literature on the causes of stress and anxiety, and especially post-traumatic stress disorder (PTSD). These studies show that recurrent violence increases stress and anxiety, especially in vulnerable populations. The second argument is that religion is a unique coping mechanism to reduce stress and anxiety. Religion has been shown to offer psychological and physiological benefits to people in adverse life circumstances, as well as strong social

networks that can reduce the pain of life stressors. Religious coping also has been shown to be more efficacious than non-religious forms of coping.

Using hierarchical models of data on political violence from the Political Terror Scale, and data on religiosity covering 71 countries over the period 1981-2011 from the World Values Survey, we find a consistent positive relationship between political violence and religiosity. We believe this is a causal relationship, and we show that when Middle Eastern cases are excluded (to consider the reverse causality argument that religiosity may be driving state-sponsored violence), our results become stronger. This relationship is also robust to controlling for various potential confounders, as well as the inclusion of alternative measures of political violence and religiosity from other data sources.

This article has important implications for the study of religion in political science, as well as the broad literature on secularization theory. Much of the existing research on religion and politics focuses on the effect of the former on the latter – i.e. how religious beliefs, practices, or social networks affect political outcomes such as support for gender equality, voting, and the functioning of democracy (Gill, 2001; Grzymala-Busse, 2012; Philpott, 2009; Wald & Wilcox, 2006). But the effect of politics on religion is a comparatively understudied area. Religion has generally been treated as a ‘given’ that does not warrant explanation. We argue, on the contrary, that the political arena can powerfully shape religiosity.

The second implication of our theory is that the reduction of violence is a major driver of secularization. Throughout the 20th century, religious beliefs and practices declined in much of the developed or postindustrial world. For the most part, this was explained as due to a variety of factors: rising incomes, literacy rates, and other variables associated with socioeconomic development. One overlooked mechanism of secularization, however, is the reduction of

violence. Many of the most secularized societies on earth – the countries in Scandinavia that Zuckerman (2008) studied, for instance – have become more peaceful over time, especially in terms of state-sponsored violence against citizens. The ramifications of this reduction of violence are critical – we now probably live in the most peaceful time in human history (Pinker, 2011), and a continuing reduction of violence and the threat of violence could lead to a continuing reduction of religiosity around the world.

Figure 1. Predictive margins of political violence on religious beliefs

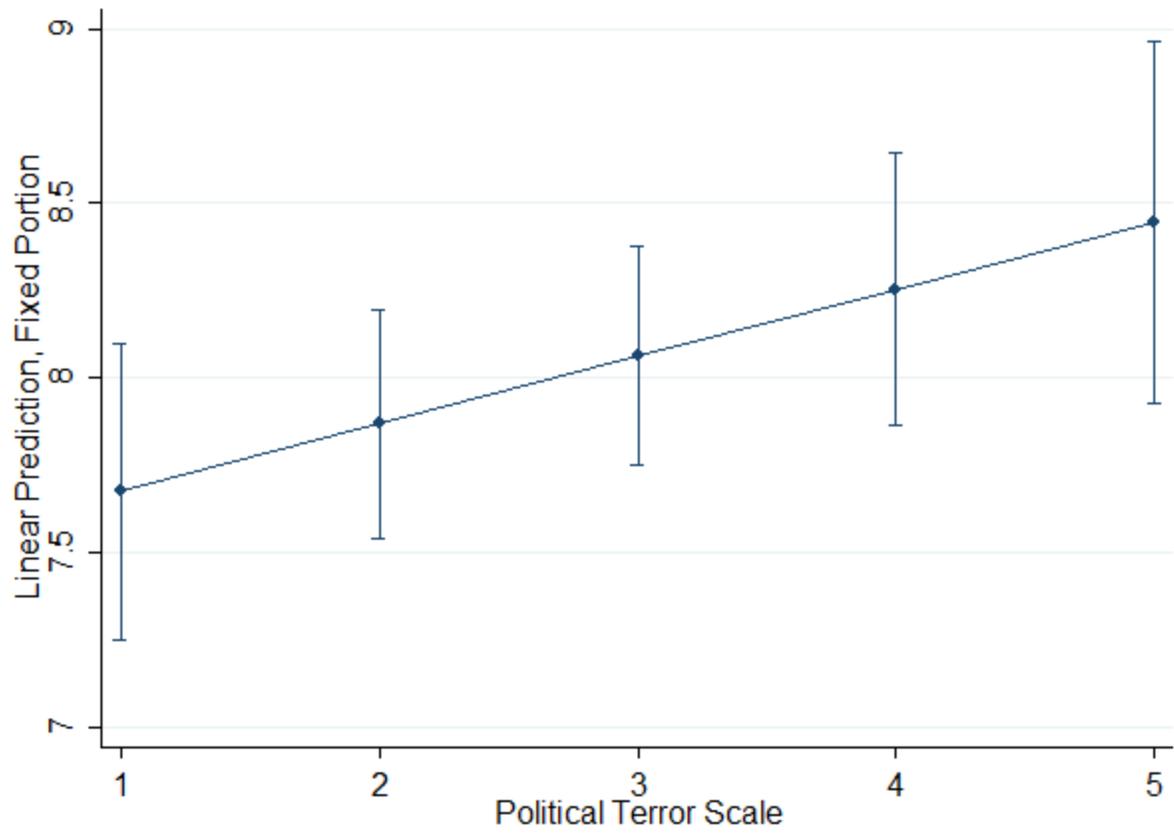


Figure 2. Predictive margins of political violence on religious attendance

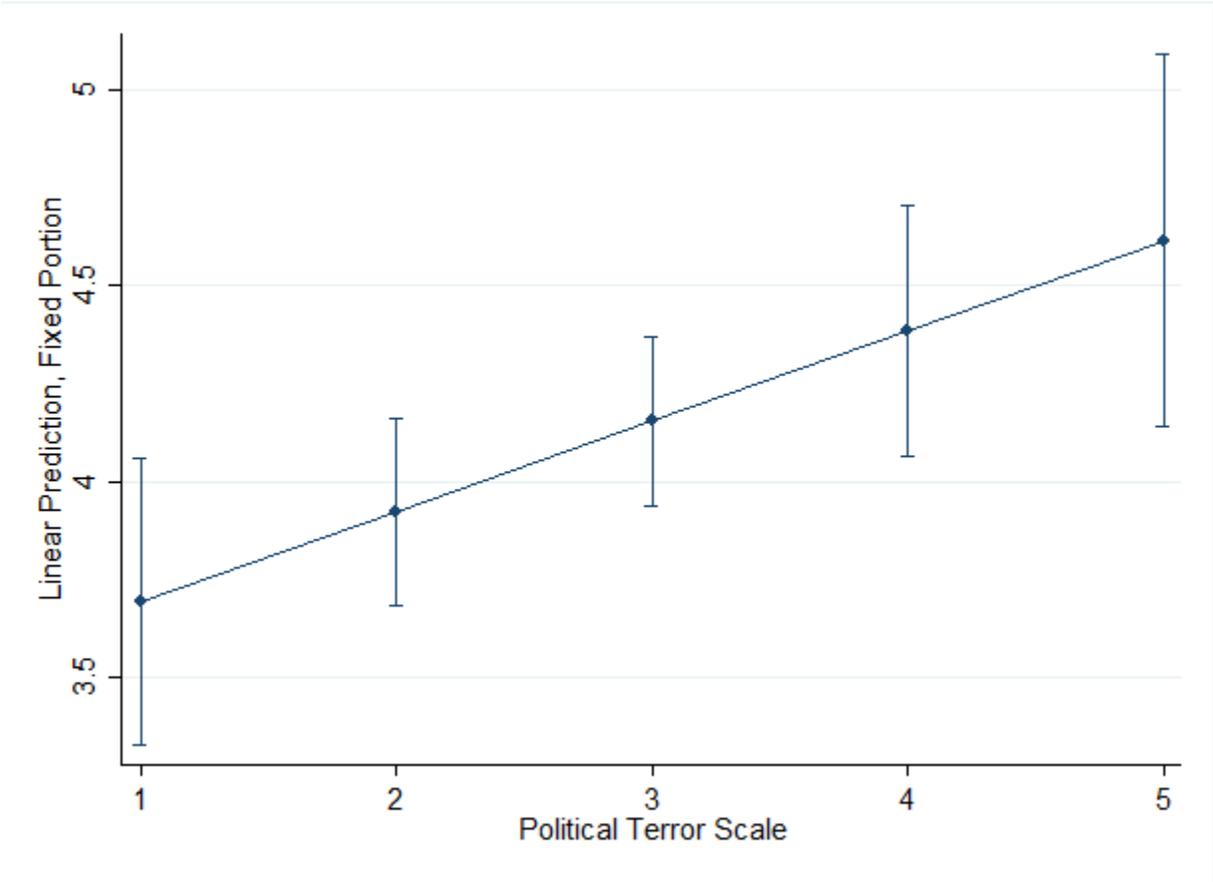


Table 1. Individual-level Variables (WVS)

Variables	Survey Items
RELIGIOSITY	
Importance of God	How important is God in your life? (1=Not at all important...10=Very important)
Attendance Religious Services	How often do you attend religious services? (recoded into 1=never/practically never, 2=less than once a year, 3= once a year, 4=special holy days, 5=once a month, 6=once a week, 7= more than once a week)
INDIVIDUAL-LEVEL CONTROL VARIABLES	
Age	Respondent's age
Male	Respondent's sex (1= male, 0=female)
Education	What is the education level of the respondent? (1=lower --up to primary school--, 2=middle --up to secondary school--, 3=upper --up to higher education--)
Income	Scale of incomes (ranges from 1=lower income to 11=higher income)

Table 2. Political Terror Scale Levels

Level	Interpretation
Level 1	Countries under a secure rule of law, people are not imprisoned for their views, and torture is rare or exceptional. Political murders are extremely rare.
Level 2	There is a limited amount of imprisonment for non-violent political activity. However, few persons are affected, torture and beatings are exceptional. Political murder is rare.
Level 3	There is extensive political imprisonment, or a recent history of such imprisonment. Execution or other political murders and brutality may be common. Unlimited detention, with or without a trial, for political views is accepted.
Level 4	Civil and political rights violations have expanded to large numbers of the population. Murders, disappearances, and torture are a common part of life. In spite of its generality, on this level terror affects those who interest themselves in politics or ideas.
Level 5	Terror has expanded to the whole population. The leaders of these societies place no limits on the means or thoroughness with which they pursue personal or ideological goals.

Table 3. Determinants of Religiosity, Multilevel Models

	Belief God is important	Attendance Religious Services
--	--------------------------------	--------------------------------------

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All countries	All countries	All countries	Middle-East excluded	All countries	All countries	All countries	Middle-East excluded
	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>
<i>Political Terror Scale</i>	.164*	.204**	.192**	.261**	.160**	.142**	.230**	.298**
	(.084)	(.092)	(.090)	(.104)	(.066)	(.067)	(.93)	(.101)
Age		.012**	.011**	.013**		.013**	.014**	.014**
		(.000)	(.000)	(.001)		(.000)	(.000)	(.000)
Male		-.530**	-.462**	-.538**		-.136**	-.023**	-.326**
		(.010)	(.011)	(.014)		(.008)	(.010)	(.010)
Education		-.109**	-.076**	-.085**		.010*	.030**	.013*
		(.007)	(.007)	(.010)		(.005)	(.007)	(.007)
Income		-.037**	-.022**	-.021**		-.002	.004*	.016**
		(.002)	(.002)	(.003)		(.002)	(.002)	(.003)
GDP per capita (logged)			-.326**	-.428**			-.407**	-.410**
			(.073)	(.084)			(.066)	(.071)
Freedom of religion			-.031	.001			.045	.048
			(.104)	(.116)			(.113)	(.118)
EOR clause in constitution			.016	-.107			.297	.529
			(.320)	(.357)			(.292)	(.328)
Religious fractionalization			-.823	-.402			.212	.231
			(.817)	(.869)			(.550)	(.584)
Protestantism			-.617	-.720			-.221	-0.242
			(.509)	(.515)			(.343)	(.348)
Orthodox Christianity			-.633	-.748			-.989**	-1.049**
			(.538)	(.539)			(.366)	(.368)
Islam			.572	.167			-.564	-0.514
			(.485)	(.518)			(.349)	(.364)
Eastern religions			-2.029**	-2.109**			-.630*	-.653*
			(.569)	(0.568)			(.381)	(.381)
Constant	7.296**	7.360**	10.884**	11.40**	3.621**	3.188**	6.478**	6.487**
	(.297)	(.312)	(.837)	(0.910)	(.212)	(.219)	(.748)	(.792)
N individuals	237,506	201,361	142,771	117,089	232,978	198,725	138,378	115,439
N country-years	164	149	105	92	162	148	103	92
N countries	80	79	72	65	79	78	71	65

** p<0.05 *p<0.1

Table 4. Religiosity Variables (ISSP)

Variables	Survey Items
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RELIGIOUS ATTENDANCE

- Religious Attendance 1 How often do you take part in the activities or organizations of a church or place of worship other than attending services?
(1=never, 2=less than once a year, 3=about once or twice a year, 4=several times a year, 5=about once a month, 6=2-3 times a month, 7=nearly every week, 8=every week, 9=several times a week)
- Religious Attendance 2 How often do you visit a holy place for religious reasons such as going to [shrine/temple/church/mosque]? Please do not count attending regular religious services at your usual place of worship, if you have one. (1=never, 2=less than once a year, 3=about once or twice a year, 4=several times a year, 5=about once a month or more)

RELIGIOUS BELIEFS / SPIRITUALITY

- Perception of Religiosity 1 Would you describe yourself as...? (recoded into 1=extremely religious, 2=very religious, 3=somewhat religious, 4=neither religious nor non-religious, 5=somewhat non-religious, 6=very non-religious, 7=extremely non-religious)
- Perception of Religiosity 2 What best describes you...? (recoded into 1= I don't follow a religion and don't consider myself to be a spiritual person interested in the sacred or the supernatural, 2= I don't follow a religion, but consider myself to be a spiritual person interested in the sacred or the supernatural, 3= I follow a religion, but don't consider myself to be a spiritual person interested in the sacred or the supernatural, 4= I follow a religion and consider myself to be a spiritual person interested in the sacred or the supernatural.
-

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APPENDIX

Appendix 1. Summary Statistics

	Mean	SD	Min	Max
MAIN VARIABLES				
PTS Scale	2.854	1.137	1	5
Belief God is Important	7.728	3.004	1	10
Attendance Religious Services	4.001	2.151	1	7
INDIVIDUAL-LEVEL VARIABLES				
Age	40.739	16.118	18	99
Male	.482	.499	0	1
Education	1.832	.839	0	3
Income	4.623	2.319	1	10
COUNTRY-LEVEL VARIABLES				
GDP per capita (logged)	8.586	1.449	5.472	11.351
Freedom of religion	1.141	.846	0	2
EOR clause in constitution	.197	.398	0	1
Religious fractionalization	.448	.252	.002	.860
Catholicism	.273	.445	0	1
Protestantism	.205	.404	0	1
Orthodox Christianity	.134	.341	0	1
Islam	.251	.433	0	1
Eastern religions	.131	.338	0	1

Appendix 2. Determinants of Religiosity, Multilevel Models (Alternative Measure of Political Violence)

	Belief God is Important			Attendance Religious Services		
	(1)	(2)	(3)	(4)	(5)	(6)

	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>
<i>Physical Integrity Scale</i>	.124**	.183**	.148**	.088**	.085**	.107**
	(.031)	(.035)	(.041)	(.032)	(.032)	(.046)
Age		.013**	.012**		.013**	.014**
		(.000)	(.003)		(.000)	(.000)
Male		-.564**	-.479**		-.187**	-.077**
		(.010)	(.011)		(.007)	(.009)
Education		-.113**	-.078**		.009	.024**
		(.007)	(.008)		(.005)	(.006)
Income		-.039**	-.025**		-.003*	.005**
		(.002)	(.002)		(.002)	(.002)
GDP per capita (logged)			-.304**			-.420**
			(.069)			(.067)
Freedom of religion			-.008			.058
			(.095)			(.113)
EOR clause in constitution			.095			.336
			(.298)			(.284)
Religious fractionalization			-.208			.601
			(.801)			(.534)
Protestantism			-.967*			-.363
			(.495)			(.331)
Orthodox Christianity			-.602			-.936**
			(.549)			(.370)
Islam			.562			-.461
			(.481)			(.342)
Eastern religions			-2.151**			-.689*
			(.584)			(.384)
Constant	7.188**	7.129**	10.391**	3.688**	3.243**	6.644**
	(.216)	(.223)	(.806)	(.158)	(.166)	(.754)
N individuals	254,580	213,650	145,079	250,924	211,439	139,847
N country-years	180	162	109	179	161	106
N countries	87	86	77	85	84	75

** p<0.05 *p<0.1

Appendix 3. Determinants of Religious Attendance, Multilevel Models (Alternative Survey Database: ISSP)

	Religious Attendance 1			Religious Attendance 1			Religious Attendance 2			Religious Attendance 2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>									
<i>Political Terror Scale</i>	.267**	.294**	.272**				.178**	.191**	.182*			
	(.091)	(.095)	(.102)				(.076)	(.079)	(.095)			
<i>Physical Integrity index</i>				.190**	.211**	.215**				.121**	.131**	.142**
				(.047)	(.048)	(.066)				(.038)	(.039)	(.062)
Age		.015**	.015**		.014**	.014**		.006**	.006**		.006**	.006**
		(.000)	(.000)		(.000)	(.000)		(.000)	(.000)		(.000)	(.000)
Male		-.337**	-.337**		-.315**	-.315**		-.189**	-.189**		-.186**	-.186**
		(.016)	(.016)		(.016)	(.016)		(.010)	(.010)		(.009)	(.009)
Education		.031**	.031**		.024**	.024**		.018**	.018**		.016**	.016**
		(.006)	(.006)		(.006)	(.006)		(.003)	(.003)		(.003)	(.003)
GDP per capita (logged)			-.272**			-.117			-.023			.075
			(.131)			(.153)			(.123)			(.143)
Freedom of religion			.087			.167			.076			.127
			(.157)			(.160)			(.147)			(.150)
EOR clause in constitution			-.314			.081			-.377			-.115
			(.535)			(.527)			(.501)			(.494)
Religious fractionalization			-.389			-.203			-.582			-.463
			(.477)			(.479)			(.446)			(.449)
Protestantism			.237			.136			-.189			-.255
			(.241)			(.243)			(.226)			(.228)
Orthodox Christianity			-1.164**			-1.082**			-.410			-.360
			(.340)			(.336)			(.318)			(.315)
Islam			-.443**			-.701			-.051			-.221
			(.592)			(.584)			(.554)			(.548)
Eastern religions			.390			.263			.068			-.016
			(.346)			(.345)			(.323)			(.323)
Constant	1.951**	1.252**	4.080**	2.103**	1.446**	2.444	1.708**	1.400**	1.898	1.812**	1.526**	.860
	(.192)	(.203)	(1.594)	(.135)	(.144)	(1.814)	(.162)	(.167)	(1.493)	(.110)	(.114)	1.700
N individuals	57,495	56,895	56,895	58,677	58,067	58,067	58,129	57,525	57,525	59,311	58,699	58,699
N countries	42	42	42	44	44	44	42	42	42	44	44	44

** p<0.05 *p<0.1

Appendix 4. Determinants of Perceived Religiosity, Multilevel Models (Alternative Survey Database: ISSP)

	Perception of Religiosity 1			Perception of Religiosity 1			Perception of Religiosity 2			Perception of Religiosity 2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	<i>b/(se)</i>	<i>b/(se)</i>	<i>b/(se)</i>									
<i>Political Terror Scale</i>	.278**	.299**	.196*				.231**	.243**	.146**			
	(.086)	(.091)	(.108)				(.056)	(.058)	(.070)			
<i>Physical Integrity index</i>				.154**	.172**	.148**				.118**	.128**	.081*
				(.041)	(.043)	(.070)				(.027)	(.028)	(.046)
Age		.015**	.015**		.015**	.015**		.008**	.008**		.008**	.008**
		(.003)	(.003)		(.000)	(.000)		(.000)	(.000)		(.000)	(.000)
Male		-.394**	-.394**		-.390**	-.389**		-.284**	-.284**		-.281**	-.281**
		(.011)	(.011)		(.011)	(.011)		(.008)	(.008)		(.008)	(.008)
Education		-.043**	-.043**		-.047**	-.047**		-.021**	-.021**		-.024**	-.024**
		(.004)	(.004)		(.004)	(.004)		(.003)	(.003)		(.003)	(.003)
GDP per capita (logged)			-.121			-.021			-.137			-.112
			(.140)			(.160)			(.091)			(.106)
Freedom of religion			.201			.252			.035			.045
			(.167)			(.168)			(.108)			(.112)
EOR clause in constitution			-.532			-.253			-.031			.148
			(.570)			(.554)			(.369)			(.367)
Religious fractionalization			-.347			-.225			-.310			-.272
			(.507)			(.503)			(.329)			(.334)
Protestantism			-.121			-.187			-.131			-.151
			(.256)			(.255)			(.166)			(.169)
Orthodox Christianity			.326			.380			-.002			.029
			(.361)			(.353)			(.235)			(.234)
Islam			1.207*			1.026*			.206			.090
			(.630)			(.613)			(.408)			(.407)
Eastern religions			.049			-.038			-.045			-.088
			(.367)			(.361)			(.238)			(.240)
Constant	3.664**	3.190**	4.460**	3.852**	3.408**	3.430**		1.938**	3.638**	2.374**	2.152**	3.497**
	(.182)	(.193)	(1.696)	(.120)	(.126)	(1.903)		(.124)	(1.101)	(.080)	(.083)	(1.264)
N individuals	57,290	56,704	56,704	58,450	57,856	57,856	52,995	52,504	52,504	54,057	53,557	53,557
N countries	42	42	42	44	44	44	42	42	42	44	44	44

** p<0.05 *p<0.1

ⁱ Zussman's (2014) study examines the effect of violence on religiosity within Israel.

ⁱⁱ For an overview on the PTSD literature, see Shiromani, Keane, and LeDoux (2009).

ⁱⁱⁱ Taken from the U.S. Department of Veterans Affairs (http://www.ptsd.va.gov/public/PTSD-overview/basics/symptoms_of_ptsd.asp).

^{iv} Luke 6: 20-21

^v Luke 23: 43

^{vi} Luke 7: 36-50

^{vii} More technical information about the survey designs can be obtained from the website of the WVS:

<http://www.worldvaluessurvey.org/WVSContents.jsp?CMSID=FieldworkSampling>.

^{viii} More details about the codification of the Political Terror Scale can be found on the following website:

<http://www.politicalterrorsscale.org/Data/Documentation.html>.

^{ix} We also estimated models using the UNDP Human Development Index as the measure of economic development, and the results are the same. These models are not reported here, but are available upon request from the authors.

^x The information regarding the predominant religion in each country was obtained from Norris and Inglehart (2004: 46).