The role of education, religiosity and development on support for violent practices among Muslims in thirty-five countries

Abstract

Despite widespread scholarly interest in values and attitudes among Muslim populations, relatively little work has focused on specific attitudes popularly thought to indicate anti-modern or anti-liberal tendencies within Islam. In this article, we use data from the Pew Research Center from 2008-2012 to examine support for violent practices among Muslims in thirty-five countries. Support for violent practices is defined by three questions on the acceptability of killing apostates, the stoning of adulterers, and severe corporal punishment for thieves. Using multilevel models that capture country-level variability, we analyze the relationship between support for violent practices and education, religiosity, and development. In general, we find that support for violent practices is less common among individuals with more education and less religiosity and who come from more developed countries. However, when we examine variation across countries, we see evidence of substantial heterogeneity in the association of education and religiosity with support for violent practices. We find that education and religiosity are less liberalizing in less liberal countries. Furthermore, there is no association between the effects of education and religiosity within a country. We discuss the implications of these findings more broadly based on prior work on liberal value systems in mostly Western countries. Overall, the variation we observe across countries calls into question a civilizational approach to studying values among Muslim populations and points to a more nuanced multiple modernities approach.

Introduction

In a viral appearance on the HBO Show "Real Time with Bill Maher" in 2014, actor Ben Affleck became embroiled in an unexpected debate with host Bill Maher and fellow guest, Sam Harris, over the allegedly authoritarian and violent tendencies of Islamic doctrine [1]. Harris, one of the leading figures in the New Atheist movement, argued that Islam "at this moment is the motherlode of bad ideas." To support this view, Maher offered data from a recent poll of Muslims worldwide conducted by the Pew Research Center which showed that "like 90%" of Egyptian Muslims supported death as a punishment for leaving the faith.

Although Maher's figure was factually correct, the statistic is nonetheless misleading. Egyptian Muslims were more supportive of this statement than Muslims in any other country in the Pew study. In contrast, only 0.8% of Muslims in Kazakhstan felt similarly. Among the more than thirty countries in the cited Pew survey as well as a similar one conducted in sub-Saharan Africa, the level of support among Muslims for killing apostates varies uniformly between these two extremes. Substantial variation rather than strict orthodoxy is the key to understanding Muslim responses to this question. For social scientists, this variation then begs a further question - why do Muslims vary so much in their support for such "bad" ideas?

In this article, we take up this question with a more formal analysis of the Pew data. The data were collected between 2008-12 on Muslims in thirty-five countries

representing roughly sixty-five percent of the global Muslim population. From this data, we develop a value construct measuring support for violent practices from three questions on the acceptability of killing apostates, the stoning of adulterers, and severe corporal punishment for thieves. Following prior work on the impact of modernization and development on liberal values in mostly Western contexts, our analysis focuses on the relationship between this value construct, education, religiosity, and development.

Our analysis builds on an extensive literature on values and attitude among Muslims, and complements prior research in two important ways. First, we address specific attitudes that have never been examined in scholarly work, despite their prominence in popular discussions of Islam in the West. Most prior research focuses either on attitudes regarding universalistic and abstract concepts such as support for democracy, political violence, and gender equality, or relies upon large aggregate indices that are driven by a multitude of specific attitudes ranging from acceptance of abortion to whether respondents would be willing to sign a petition [2].

A focus on universalistic attitudes, however, provides little insight into the specific attitudes and values that differentiate cultural and religious groups. For example, whether a respondent is willing to sign a petition or is supportive of democracy in the abstract may tell us little to nothing about how that respondent feels toward the mandate that apostates should be killed. Yet, the justifiability of killing apostates is a topic that both divides Muslims internally and distinguishes Muslims from other religious groups. It is not simply that Muslims feel differently on this issue in comparison to other religious groups, but rather that the question itself is only intelligible among Muslims.

Second, the large sample of countries here allows us to more systematically examine country-level variation than has been possible in much of the prior work on value systems in Muslim populations. While classic modernization theory expected a fairly uniform pattern of modernization, contemporary scholars expect greater heterogeneity in this process [3]. Some have even suggested that change in cultural systems – including values and attitudes – may be largely unconnected to processes of modernization and development [4]. To better understand this heterogeneity, we use multilevel models that provide information about country-level variation in support for violent practices and country-level variation in the association between support for violent practices and education and religiosity. We argue that the pattern of variation at the country level provides insight into the role of educational and religious institutions in the process of value change.

When we pool results across countries, our analysis largely supports the expectations of modernization theory. Support for violent practices is less common among individuals with more education and less religiosity and who come from more developed countries. However, when we examine variation across countries, we see evidence of substantial heterogeneity in the effects of education and religiosity on support for violent practices. In both cases, we find that the association between education/religiosity is less liberalizing in countries that are more supportive of violent practices overall, suggesting that the role of educational and religious institutions shifts with changes in the larger society. Furthermore, we find little association between the effects for education and religiosity themselves, suggesting that idiosyncratic county-level factors operate independently on religious and educational institutions.

Background

Prior work on values and attitudes in Muslim populations has focused on a variety of such attitudes including support for democracy [5–7], political violence [8, 9], women's rights [10], and fundamentalism [11]. While a summary of this work is beyond the scope

of this article, such studies are often framed around modernization theory and its closely related cousin, secularization theory, as well as critiques of these theories [6, 12, 13].

Modernization theory treats cultural and value change as largely a by-product of structural development [14–16]. Industrialization and economic growth bring about greater differentiation in the occupational workforce, urbanization, and higher standards of living [17]. All of these factors contribute to a shift from conservative and authoritarian values to liberal values that promote individual autonomy and self-determination [15]. Concomitantly, rationalization, individualism, and cultural pluralism reduce the significance of religious institutions in favor of secular institutions, diminishing the role of religion in social life [18–20].

For this article, we focus on two important themes within this framework. First, scholars often treat education and religiosity as key variables at the individual level connected to processes of modernization and value change [21]. Second, contemporary critiques of modernization theory have often pointed to the heterogeneity and variation in the experience of development across countries rather than its uniformity and standardization [22].

The role of education and religiosity on values

Education is often seen as a crucial fulcrum at the individual level for processes of modernization [23–25]. In terms of value change, research has repeatedly shown that education is positively related to liberal values [26–29].

While these results are broadly consistent with modernization theory, significant debate has persisted on how to understand this finding. The development perspective holds that education is linked to fundamental cognitive changes in the way people view the world that leads to more tolerance and less authoritarianism [30, 31]. On the other hand, the socialization perspective argues that educational institutions socialize individuals to the prevailing norms of a society [32–34]. Therefore, the liberalizing effects of education will only exist in countries where liberal values are commonplace. Consistent with the socialization perspective, cross-national results in Western countries show that the positive effect of education is greatest in countries with more liberal values overall [35].

Social scientists have often treated religiosity as the anti-modern counterweight to education [36]. High levels of religiosity are seen to indicate commitments to conservative and authoritarian values [37–39]. Although there is significant heterogeneity across countries, research has shown that religious identification tends to be associated with support for right-wing parties and more conservative attitudes [39–43].

However, the relationship between religiosity and conservative values may be partially tautological depending on how religiosity is defined. Given that the core religious texts of the major Western religions are frequently conservative and authoritarian, it is not surprising that strong believers with a tendency for theological literalism would themselves be more conservative and authoritarian. Therefore, in analyzing the effect of religiosity on values and attitudes, it is imperative to distinguish the effects of theological conservatism and literalism from the effects of variables that measure how important religion and religious practices are in a person's life.

Although less widely acknowledged than for the case of education, the effect of religiosity may similarly be mediated by the role that religious institutions play as socialization agents [21]. In particular, religious institutions may respond to the prevailing norms and beliefs in a society in one of two ways. Greater liberalism within a society may dampen the conservative effect of religiosity on liberal values or it may alternatively provoke a greater defense of religious values and increase the association between religiosity and conservative values [44].

Heterogeneity and multiple modernities

Modernization theorists have viewed modernization as a fundamental process that would evolve similarly across countries, ultimately producing a global cosmopolitan society through the broad convergence in social and cultural systems [45]. Many scholars today criticize this view for privileging the historical experience of the West as a universal model. These "multiple modernities" scholars argue that while modernity will likely lead to changes in social and cultural systems, these changes will materialize in multiple dissimilar and non-convergent forms because countries develop within various historical and cultural contexts [46–49].

In the present study, consideration of such heterogeneity is relevant to studying values in Muslim populations in two ways. First, the "civilizational" argument proposed by Samuel Huntington suggests that heterogeneity across countries will largely correspond to civilizational blocs defined primarily along religious lines [4]. According to Huntington, Western liberal traditions such as individualism, support for pluralism, and secularism are not intrinsic to the process of modernity but rather a specific inheritance of Western civilization [4]. If this is the case, then we should not expect to see that development, education, and religiosity have the same effect on values and attitudes in Muslim societies as those observed elsewhere.

Specifically, Huntington argued that the primary agents for the contemporary rise of Islamic fundamentalism were an urban and educated middle class [4]. Rapid economic growth and urbanization dislocate individuals from traditional structures of social support and this dislocation is experienced most intensely by upwardly mobile, young, urban, and educated individuals. Therefore, contrary to research primarily in Western contexts showing a positive relationship between liberal values and education, Huntington expected a negative relationship in Muslim societies.

Second, and contrary to the expectation of both classic modernization theory and the civilizational argument, we may observe significant variation in how educational and religious institutions affect values across Muslim countries. These differences may reflect a wide variety of societal influences, some of which are historical and idiosyncratic. Nonetheless the patterning of such variation across countries may be informative. The expectations of socialization theory discussed above are one example of such patterning. We discuss further expectations below.

Analytical approach and theoretical expectations

Using the Pew data detailed below, we build a model that can simultaneously measure the effects of education, religiosity, and development on support for violent practices and account for heterogeneity in these effects across countries. Specifically, we use a random intercept and random slope multilevel model, in which the intercepts and the slopes for the educational attainment and religiosity variables are allowed to vary across countries. Our general model specification is:

$$y_{ij} = \beta_{0j} + \beta_{1j}(\texttt{religiosity}_{ij}) + \beta_{2j}(\texttt{education}_{ij}) + \sum_{k=1}^{K} \lambda_k x_{ijk} + \epsilon_{ij}$$

where y_{ij} is the score on the measure of support for violent practices (detailed below) for the ith respondent in the jth country. The intercept β_{0j}, and the two slopes of β_{1j} and β_{2j} on religiosity and education, respectively, are allowed to vary by country. The model also includes K additional independent control variables x_{ijk} that are not allowed to vary by country. ϵ_{ij} is an individual-level error term.

To complete the multilevel model structure, the three country-varying parameters have their own linear equations:

$$\beta_{0j} = \gamma_{01} + \gamma_{02}\texttt{development}_j + \delta_j$$
$$\beta_{1j} = \gamma_{11} + \gamma_{12}\texttt{development}_j + \eta_j$$
$$\beta_{2j} = \gamma_{21} + \gamma_{22}\texttt{development}_j + \tau_j$$

The structure shown here is for the fullest model in which we include a country-level measure of development (detailed below) that predicts the intercept and the two slopes. The γ_{02} term measures the association between development and average support for violent practices in a country. The γ_{12} and γ_{22} terms measure how development in a country affects the individual-level relationship between support for violent practices and either education or religiosity, respectively.

The error terms δ_j, η_j and τ_j are country-level random effects that measure country-level heterogeneity in terms of the intercept and two slopes. Because the correlation of these random effects is important for our understanding of this heterogeneity across countries, we place no restrictions on the correlation between these error terms in the estimation of the model.

Given the model outlined above, we develop several expectations about the estimates it will produce. These expectations relate to several different parameters in the model. First, we lay out the expectations of the effects of development at the country level (γ_{02}) as well as the average effects of religiosity (γ_{11}) and educational attainment (γ_{21}) across countries. Modernization theory expects that overall development at the country level and educational attainment at the individual level will be negatively associated with support for violent practices, while religiosity will be positively associated with support for violent practices.

Second, we also consider how development might affect the relationship between support for violent practices and religiosity (γ_{12}) or educational attainment (γ_{22}). We consider two possibilities for each variable. First, modernization may produce a "flattening" effect in which overall development reduces the association as individuals become more liberal regardless of education or religiosity. Alternatively, modernization may produce a "steepening" effect in which the association gets larger as development increases and differences in values grow in magnitude between individuals of different educational attainment or religiosity.

Finally, we explore the heterogeneity in the effects of education and religiosity across countries by an examination of the correlation between the random components of the model. These random components provide estimates of how specific countries deviate from the global averages. We analyze these correlations in two ways. First, we analyze how the country-level variation in the association between support for violent practices and religiosity (η_j) or educational attainment (τ_j) is correlated with the overall average level of support for violent practices within that country (δ_j). These correlations tell us the degree to which these associations increase or decrease with the overall sentiment of the country. They therefore offer a test of the socialization hypothesis which would expect a positive correlation. If this is the case, it suggests that educational and religious institutions move in step with popular attitudes.

Second, we analyze the correlation between the religiosity (η_j) or educational attainment (τ_j) random effects themselves. This correlation tells us the degree to which unmeasured factors producing heterogeneity in these effects across countries operate similarly or differently on educational and religious institutions. We consider three possibilities for this correlation. If the correlation is positive, then we observe a process of synchronicity in which educational and religious institutions are responding in the same way to other societal influences. Alternatively, if the correlation is negative, then we observe a process of polarization between education and religious institutions, in which other societal influences push educational and religious institutions in opposite

directions. A third possibility is that the correlation is zero, suggesting that the societal changes affecting these institutions operate in independent and unconnected ways.

Materials and methods

Data for this analysis come primarily from two cross-national surveys conducted by the Pew Research Center's Religion and Public Life project. The first survey, *Tolerance and Tension: Islam and Christianity in Sub-Saharan Africa*, sampled more than 25,000 respondents in nineteen countries in sub-Saharan Africa in 2008-2009. The second survey, *The World's Muslims: Religion, Politics and Society*, sampled more than 30,000 Muslim respondents in twenty-six countries throughout the world in 2011-2012. The questionnaires for the surveys are very similar, although additional questions were added and some other questions were re-worded in the second survey. We focus our analysis only on questions that are consistent across both surveys.

We combine Muslim respondents from these surveys together to construct our full analytical dataset. Five sub-Saharan African countries (Democratic Republic of Congo, Botswana, Rwanda, South Africa, and Zambia) were excluded from analysis because of minuscule (2% or less) Muslim populations. Four other countries were excluded because key questions for the analysis were not asked in those countries (Iran, Morocco, Mozambique, and Uzbekistan). Finally, Thailand was excluded because the sample was not nationally representative. Fig 1 shows a map of the countries included in our analysis with shading by the percent Muslim in each country. The countries in the sample cover all regions of the world with substantial Muslim populations. In total, we use data from 35 countries and 35,400 respondents. The average sample size per country was 1,011 respondents with a minimum size of 245 respondents in Cameroon and a maximum size of 1,918 respondents in Bangladesh.

Fig 1. Map showing countries included in the analysis by percent Muslim. Mollweide projection used to preserve area proportions.

Because the country-level surveys were designed to be nationally representative, the data should be representative of within-country populations, but not necessarily the global Muslim population. Collectively, the countries in the sample roughly account for sixty-five percent of the global Muslim population [50], but some important countries both symbolically (e.g. Saudi Arabia, Iran) and by population weight (e.g. India) are absent.

Several variables used in this analysis are constructs made up of multiple individual items, including the dependent variable and the measure of religiosity. All constructs were developed through an exploratory factor analysis that identified points of separation and correlation between items.

Measuring support for violent practices

We develop our measures of support for violent practices based on multiple questions that were fielded in both surveys. Respondents were asked yes/no questions for whether they favored (a) the death penalty for people who leave Islam, (b) harsh punishments like whipping and cutting off hands for crimes like theft and robbery, and (c) stoning people who committed adultery. These three measures were highly correlated with one another (Cronbach's $\alpha = 0.83$) and exploratory factor analysis indicated that a single scale worked well for all three variables. We also considered a likert-scale question on the justifiability of violence against civilians in defense of religion, but this variable had

a much weaker correlation with the three other measures and so we dropped it from analysis.

Fig 2 shows the average level of support by country for the three items that make up our measure of support for violent practices. Countries tend to have similar levels of support for all items within the construct, but the variation across countries is substantial. Support for these values ranges from virtually no support in countries such as Azerbaijan and Kazakhstan to nearly universal support in countries such as Afghanistan and Egypt.

Fig 2. Dotplot of percentage of Muslim respondents who support three different questions measuring support for violent practices for the violation of norms. Countries are ordered from lowest to highest average level of support across all three questions.

We constructed the dependent variable for our models by counting the number of favorable responses to each question and then re-scaling this tally to have a mean of zero and a standard deviation of one.

Measuring development

At the country-level, we considered two different possibilities for a measure of overall development. Gross domestic product (GDP) per capita is often used as a purely economic measure of the level of development. On the other hand, the Human Development Index (HDI), produced by the United Nations Development Program, offers a more holistic measure of development. The HDI considers three separate components in its overall measure: life expectancy at birth, overall educational attainment, and gross national income per capita. These three components are combined into a single composite index.

These two measures are highly correlated among the countries used in the analysis ($r = 0.78$). All models reported here use the HDI. We chose the HDI as our primary measure of development because it allows us to parsimoniously capture mutiple dimensions of development. As a sensitivity analysis, we constructed identical models with a logged GDP per capita measure. The results were similar, although the logged GDP variable tended to produce slightly smaller overall effects than HDI. The models from this sensitivity analysis are available in the S1 Appendix.

Independent variables

Education is a key measure in our analysis, but the categories used for educational attainment are country-specific, making it challenging to include in a cross-national analysis. Educational attainment was reported as a three-category system for the sub-Saharan African countries and relative to country-specific educational systems for the remaining countries. These country-specific systems ranged from a high of twelve distinct categories to a low of five distinct categories. We harmonized these measures by creating a quantile score based on the distribution of the educational attainment variable within each country. Each respondent was assigned a midpoint value on the quantile score between their given level of education and the next lowest level (or zero when the respondent was in the lowest category). This quantile score measures a respondent's relative position on the distribution of education within a country. We also considered a three-category measure of absolute educational attainment consisting of no secondary education, at least some secondary education, and post-secondary education that could be used for all countries. Sensitivity tests showed that these models produced similar results, but the BIC model fit statistics strongly preferred the educational quantile measure. Full results are available in the S1 Appendix.

We measure each respondent's religiosity using a concept that combines the experiential and ritualistic dimensions of Glock and Stark's framework [51]. Our goal is to isolate the importance of religion in a person's daily life as measured by their personal experience and practice of it from specific ideological beliefs and knowledge about the religion. We measure religiosity with a three-item construct including a question on the importance of religion in a person's life, the frequency of mosque attendance, and the frequency of prayer. Across the entire sample, this three item construct had a Cronbach's α of 0.68. Mosque attendance has been criticized by some scholars as an inappropriate Western import for measuring religiosity among Muslims [52]. However, sensitivity tests suggested that mosque attendance had similar effects on outcomes as other measures of religiosity when we examined the separate effect of each variable and we therefore retain it. These results are available in the S1 Appendix.

Prior research has shown that religiosity is positively associated with theological literalism, conservativism, and fundamentalism among Muslims [11]. Individuals with more literal and theologically conservative beliefs are likely to have more anti-liberal values simply because some of the measures used for the dependent variable can be argued to have scriptural justification. To control for this potential confounding influence in our analysis, we tested a separate construct that measured theological conservatism and literalism in a person's actual beliefs. We considered questions on whether a person must believe in god to be moral, whether Islam is the one true faith, and whether there was only one way to interpret religious teachings. However, these questions did not hold up well as a single construct (Cronbach's $\alpha = 0.38$). Therefore, to capture theologically conservative beliefs and practices, we included all three questions as separate independent variables in our models.

We include a variety of other individual-level variables in all models. We include variables for the age (five-year brackets), gender, income, and urbanicity of the respondent. Income was reported in loosely defined quartiles (i.e. four categories from "low" to "high") for the sub-Saharan African countries and brackets that were specific to each national currency for remaining countries and so we use a method identical to that for education to create income quantile scores. The country-specific income brackets ranged from a high of seventeen distinct categories to a low of five distinct brackets.

We also include a measure of the respondent's self-reported denomination. The primary division here is between Sunni and Shia, but many respondents also identified in a non-denominational way (e.g. "just a Muslim") which we retain as a separate category. We combine all other denominations into a single "other" category. A separate item asked respondents whether they identified with any Sufi orders. We code this as a binary variable that is distinct from the denominational categories.

We also control for non-religious ideological views. We constructed an index of socially conservative views based on the respondent's answers regarding the acceptability of seven stigmatized behaviors (drinking alcohol, euthanasia, suicide, abortion, prostitution, premarital sex, and homosexuality; Cronbach's $\alpha = 0.76$). We also combine two questions that gauge respondents' attitudes toward Western movies, music, and television into an anti-Westernization scale. Finally, we include questions on whether religion is in conflict with modernity, and whether the country would be better off with a strong leader rather than a democratic government.

Multiple imputation

We use multiple imputation to address missing values in the dataset. We imputed five complete datasets using multivariate imputation by chained equations [53]. We generally did not impute values when a question was missing because it was not asked in a particular country, but we made two exceptions to this rule. Questions regarding the moral acceptability of prostitution, premarital sex, and homosexuality were not

asked in Afghanistan and the two questions about the morality of western movies, music, and television were not asked in Lebanon. In both of these cases, we imputed values in order to maximize country sample size. The percentage of values imputed ranged from a high of 11.4% for the question on whether religion was in conflict with modernity to 0.7% for the respondent's age. We included dependent variables in the imputation procedure, but drop cases that were missing on the dependent variable. After this exclusion, the sample size of our anlalytical dataset is 31,528 respondents.

Scaling variables

To facilitate comparisons between variables in the models, all quantitative variables have been re-centered on the mean and re-scaled. The dependent variable has been divided by its standard deviation. Independent variables have been divided by twice their standard deviation. The estimated effects of quantitative variables shown throughout this article can be interpreted as the expected change in standard deviations of the dependent variable for an increase of two standard deviations in the independent variable. Dividing by twice the standard deviation makes the slopes of quantitative variables in linear models roughly comparable to the effects of categorical dummy variables [54].

Results

Table 1 shows the results of three multilevel models predicting support for violent practices. Model 1 includes only individual level variables. Model 2 adds in the country-level Human Development Indicator (HDI) as a predictor of average support for violent practices in a country. Model 3 additionally allows HDI to be a predictor of the association between religiosity/education and support for violent practices within a country.

The individual-level variables are highly consistent across models. Although we focus primarily on the effects of education and religiosity, we first briefly summarize the effects of other variables on support for violent practices. Income has little effect on support for violent practices. Similarly, we observe no difference between men and women in support for violent practices. Age differences are relatively small and do not demonstrate a consistent trend when comparing younger to older respondents. Rather, the results suggest specific cohort effects where the cohorts between ages 35-44 and 50-59 are less supportive of violent practices than adjacent cohorts. Urban residents are less likely to support violent practices than those in rural areas. In terms of denomination, Sunnis are the most supportive of violent practices and Shias the least supportive, with other denominations and "just a Muslim" respondents falling in between. Self-identifying as a member of a Sufi order is associated with greater support for violent practices. All of the variables measuring theological conservatism are positively associated with support for violent practices. Respondents with more anti-Western views were also more supportive of violent practices. Preferences for democracy and social conservatism have little association with support for violent practices.

Religiosity is more strongly associated with support for violent practices than any of the other individual-level independent variables. A two standard deviation increase in religiosity is associated with roughly a 0.24 standard deviation increase in the support for violent practices scale, even when holding constant a variety of demographic and ideational variables. On average, across countries, Muslims who are more religiously observant and devout are more likely to support violent practices and this result is not simply a function of demography, theological conservatism, social conservatism, or anti-Western sentiment.

Table 1. Results from multilevel models predicting support for violent practices for violating norms among Muslims.

	Model 1	Model 2	Model 3
Intercept	−0.088 (0.086)	−0.119 (0.086)	−0.104 (0.086)
Religiosity	0.249 (0.033)***	0.239 (0.033)***	0.240 (0.033)***
Education quantile	−0.062 (0.023)**	−0.064 (0.023)**	−0.059 (0.022)**
Income quantile	−0.006 (0.010)	−0.005 (0.010)	−0.006 (0.010)
Age 25-29	0.010 (0.014)	0.011 (0.014)	0.010 (0.014)
Age 30-34	−0.004 (0.015)	−0.004 (0.015)	−0.004 (0.015)
Age 35-39	−0.036 (0.016)*	−0.036 (0.016)*	−0.036 (0.016)*
Age 40-44	−0.049 (0.016)**	−0.049 (0.016)**	−0.049 (0.016)**
Age 45-49	−0.025 (0.018)	−0.025 (0.018)	−0.025 (0.018)
Age 50-54	−0.040 (0.019)*	−0.040 (0.019)*	−0.040 (0.019)*
Age 55-59	−0.051 (0.021)*	−0.051 (0.021)*	−0.051 (0.021)*
Age 60 and over	−0.017 (0.019)	−0.016 (0.019)	−0.016 (0.019)
Female	−0.006 (0.009)	−0.006 (0.009)	−0.006 (0.009)
Urban	−0.052 (0.009)***	−0.052 (0.009)***	−0.052 (0.009)***
Shia	−0.133 (0.020)***	−0.132 (0.020)***	−0.132 (0.020)***
Other denomination	−0.054 (0.030)	−0.055 (0.030)	−0.055 (0.030)
Just a Muslim	−0.086 (0.012)***	−0.086 (0.012)***	−0.086 (0.012)***
Sufi	0.073 (0.014)***	0.072 (0.014)***	0.072 (0.014)***
Believe in god to be moral	0.037 (0.012)**	0.037 (0.012)**	0.037 (0.012)**
Islam is the one true faith	0.148 (0.013)***	0.148 (0.013)***	0.148 (0.013)***
One way to interpret relig. teachings	0.020 (0.010)*	0.020 (0.010)*	0.020 (0.010)*
Religion in conflict with modernity	0.074 (0.010)***	0.074 (0.010)***	0.074 (0.010)***
Anti-Westernization scale	0.119 (0.009)***	0.119 (0.009)***	0.119 (0.009)***
Prefers strong leader to democracy	0.018 (0.010)	0.018 (0.010)	0.017 (0.010)
Socially conservative scale	−0.018 (0.009)	−0.018 (0.009)*	−0.018 (0.009)
Human development index (HDI)		−0.417 (0.142)**	−0.245 (0.172)
HDI x religiosity			0.036 (0.067)
HDI x education quantile			0.095 (0.044)*
N (individual)	31528	31528	31528
N (country)	35	35	35
BIC	72311	72317	72341
SD (religiosity)	0.167	0.167	0.170
SD (education quantile)	0.123	0.122	0.115
r(intercept, religiosity)	0.471	0.541	0.542
r(intercept, education)	0.272	0.439	0.433
r(religiosity, education)	0.072	0.054	0.027

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table Notes: All models include random country-level intercepts and slopes for some variables. All quantitative variables are divided by twice their standard deviation for comparability. Results are based on five complete datasets with imputation for missing values.

The education quantile measure has a smaller negative association with support for violent practices. A two standard deviation increase in the education quantile is associated with a 0.062 standard deviation reduction in the support for violent practices scale.

Model 2 introduces the HDI measure as a predictor of support for violent practices. This country-level predictor has the largest association of any term in the model. A two standard deviation increase in the HDI is associated with a 0.417 standard deviation decrease in a country's average on the support for violent practices scale. Individuals from more developed countries are much less supportive of violent practices, on average.

In Model 3, we allow for an interaction between HDI and our measures of religiosity and education. Effectively, we are allowing the association between religiosity/education and support for violent practices to vary by the level of HDI. There is little evidence of variation in the effect of religiosity by HDI. However, the effect of education on support for violent practices varies substantially by HDI. In general, the results suggest a "flattening" effect in which the negative association between education and support for violent practices gets weaker as HDI increases. However, the effect is so large that "flattening" does not adequately account for the strengh of this interaction term. In countries that have HDI one standard deviation higher than the mean, the model expects the association to reverse direction and become positive. Thus, education is expected to be positively associated with support for violent practices in the most developed countries.

We now turn to the random country effects estimated by the models. The variance and correlation of these country effects is shown at the bottom of Table 1. The association between religiosity and support for violent practices is slightly more variable across countries than the association between education and support for violent practices, but both effects vary substantially.

Fig 3 shows the religiosity and education slopes for all countries as estimated in Model 3 of Table 1. Six countries (Egypt, Algeria, Afghanistan, Malaysia, Kenya, Pakistan, and Liberia) have estimated slopes that indicate a positive association between educational quantile and support for violent practices. The effects are very close to zero for Pakistan and Liberia, but substantial for the other countries. In these countries, individuals with more education tend to be more supportive of violent practices. Significant variation exists among countries with negative slopes as well. Tunisia stands out as an outlier in the negative direction with a slope that is nearly double the size of its nearest neighbor, Ghana.

Fig 3. Lollipop plots of the association between religiosity/education and support for violent practices in each country. Values are based on random slopes from Model 3 of Table 1. Each panel is ordered from largest to smallest association. Values are color-coded by direction.

In contrast, all of the estimated slopes for religiosity are consistently positive, with the exception of Azerbaijan where religiosity effectively has no association with support for violent practices. While the variation in these positive effects is substantial, religiosity does not contributes substantially to lower support for violent practices for any country within our sample.

Table 1 also shows the correlations between these random country effects. Both slopes are positively related to the intercept. To explore these correlations in more detail, Fig 4 shows the relationship between the country-specific intercepts and the country-specific slopes for religiosity and education. As Table 1 indicated, there is a strong positive correlation in both cases. In countries with less support for violent practices overall, the association between education and support for violent practices tends to be more negative and the association between religiosity and support for

violent practices tends to be less positive. The correlation here suggests a substantial socialization effect on both religious and educational institutions. In more liberal countries (those with less support for violent practices overall), education has more of a liberalizing influence and religiosity has less of a conservatizing influence.

Fig 4. Scatterplot showing the relationship betwen a country's average level of support for violent practices and the association between education/religiosity and support for violent practices in a country. Values are based on random intercepts and slopes from Model 3 of Table 1. Best fitting OLS line is shown for both panels.

Finally, we look at the relationship between the two measures of association. Do the effects of religiosity and education within a country tend to work in synchronicity or are they polarized? As Table 1 shows, the correlation between the two measures of association is very low, albeit slightly positive. Figure 5 shows the relationship between the two slopes on a scatterplot, confirming the low correlation. In short, there does not seem to be any connection between educational and religious divisions within a country on this outcome measure. For example, Tunisia and Egypt have similar associations between religiosity and support for violent practices, but radically different associations between education and support for violent practices. Tunisia has by far the most negative association of any country while Egypt has the most positive. The results here indicate that while religiosity and education have somewhat predictable association with support for violent practices, the particular constellation of these two associations within a country varies in non-predictable ways.

Fig 5. Scatterplot showing the relationship between country-level associations of education and religiosity with support for violent practices. Values based on random slopes from Model 3 of Table 1. Best-fitting OLS line is shown.

Conclusion

In this article, we have analyzed variation in support for violent practices among Muslims in thirty-five countries, paying particular attention to the effects of education, religiosity, and development on these attitudes, as well as the heterogeneity in effects across countries.

At first glance, the results are largely consistent with prior research and the expectations of modernization theory. Greater development in a country, as measured by the Human Development Index, strongly predicted less support for violent practices. Similarly, the effects of education and religiosity are as expected from prior research in predominantly non-Muslim contexts, when averaged across countries. More educated individuals are moderately less likely to support violent practices while individuals with greater religiosity are much more likely to support violent practices.

The association between religiosity and support for violent practices was stronger than any other individual-level variable used in the analysis. Importantly, this religiosity effect is not simply a surrogate for theological conservatism or literalism. We found that while measures of theological conservatism also predicted greater support for violent practices, the religiosity association remains strong even after controlling for these variables, as well as a variety of other ideational variables.

Looking beyond the average effects across countries toward country-level heterogeneity, the results suggest a more complex and nuanced assessment. The effects of education and religiosity were highly variable across countries. In a minority of countries, education predicts more, rather than less, support for violent practices.

Similarly, in some countries there was virtually no correlation between religiosity and support for violent practices. While we may observe tendencies in terms of the effects of educational and religious institutions on support for violent practices, these effects are far from uniform and may be strongly affected by country-level heterogeneity. In the context of the strong effect of religiosity on support for violent practices, the heterogeneity observed here demonstrates that there is no necessary connection between religiosity and support for violent practices.

How can we make sense of this variation in the effects of education and religiosity across countries? Some of this variation may reflect idiosyncratic, historical, and path-dependent processes that are not easily amenable to a quantitative analysis. However, we did explore two possibilities with regard to this variation. First, we find that the within-country association for both education and religiosity is positively correlated with the average level of support for violent practices in a country. In the case of education, Education exerts the strongest negative effect on support for violent practices in countries with the lowest average level of support overall while education has little effect or even a positive association in countries with the most support for violent practices overall. Religiosity has the strongest positive effect on support for violent practices in countries with the most support overall, and religiosity has the weakest positive effect in countries where support for violent practices is the lowest overall. Both findings are consistent with the socialization hypothesis, which argues that social institutions often reflect rather than drive changes in attitudes and values.

Second, we include the level of development as a predictor of the association between education/religiosity and support for violent practices. We find some evidence that the negative relationship between education and support for violent practices is weaker in more developed countries. This may reflect a "flattening" process whereby greater development universalizes liberal values and leads to less cleavage between educational groups. We find little evidence of an effect of development on the association with religiosity.

As a further check on what is driving country-level heterogeneity, we examined the correlation between the effects of religiosity and education across countries. Somewhat surprisingly, there is very little correlation in the effects of these two variables across countries. This implies that there is not necessarily a greater singular force (e.g. "modernization") driving change in both religious and educational institutions, but rather that these two institutions are affected disparately by factors unique to each country.

The heterogeneity we observe across countries places our results somewhere between classic modernization theory and multiple modernities. If classic modernization theory is seen as a tendency rather than a rule, our results could be considered as an accurate reflection of its expectations. Similarly, our results could also be seen as empirical evidence in support of a multiple modernities approach by showing just how different the process of modernization can be for some countries. Nonetheless, the strong aggregate tendency toward the expectations of classic modernization theory calls into question an unconstrained version of the multiple modernities approach.

This heterogeneity also casts doubt on the utility of the civilizational argument to understand value change. We find no evidence of a singular civilizational pattern of Islamic societies. Rather, we find that the general patterns of Islamic "civilization" are consistent with those observed in non-Islamic societies but with substantial variation at the country level. This variation cannot be explained by what is held constant, namely Islam. We draw attention to the results for Algeria and Tunisia to highlight this issue. Algeria and Tunisia are arguably two of the most similar countries in our dataset by geography, language, and culture. Yet, the observed relationships between education and support for violent practices are not only opposite in these two countries, but

represent two of the most extreme values in the data. In Tunisia, educational attainment strongly predicts less support for violent practices, while in Algeria, educational attainment strongly predicts greater support for violent practices. The implication is that we must delve deeper into the particular historical development of each country in order to understand this variation.

We focus in this article on whether the observed patterns in the data are consistent with the expectations of prior theory and have attempted to avoid the use of strong causal language throughout. Strong causal claims are limited by the cross-sectional nature of the data. For example, while we find that Muslims in countries with greater development tend to have less support for violent practices, we cannot show that a change in development is associated with a weakening of those attitudes. Future longitudinal data would be valuable at strengthening our understanding of causal mechanisms, albeit difficult and costly to obtain on a sample of this size and scale.

The goal of this article has been to use statistical analysis to leverage a large dataset and provide a birds-eye view of the relationship between support for violent practices and individual and country-level predictors. By necessity, this approach ignores the specificity and nuance of country-specific historical development. Our intent is not to discount or replace work that focuses on particular historical cases or small N comparative/historical analyses, but rather to complement this work with a broader comparative approach. Indeed one of the central findings of our analysis is the substantial variation in key relationships between countries. This suggests the possibility of fruitful explorations at the country-level using multiple methodological approaches to understand the substantial heterogeneity documented here.

Supporting information

S1 Appendix. Supplementary Materials. This appendix contains tables of models using alternate specifications of religiosity, education, and development.

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