



National Culture on the Cross-National Variation of Homicide: An Empirical Application of the Inglehart–Welzel Cultural Map

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Although there has been a growing literature on the effects of culture on the cross-national variation of homicide, this literature remains limited in the operationalization of national culture as well as in the modeling of the cultural effects. Adopting a multidimensional measure of national culture developed in the World Values Survey, this study examines the effects of various aspects of national culture, as well as their interaction, on the cross-national variation of homicide. The findings of this study provide evidence for the effect of national culture on homicide variation across countries while painting a more complex picture about the potential mechanisms of these effects.

KEYWORDS: crime; cross-national comparison; homicide; modernization; national culture; world values survey.

INTRODUCTION

Over the past few decades, there has been a growth in the literature on macro-level, cross-national research on homicide. This literature has consistently identified several structural predictors that robustly predict national homicide rates across countries. Structural characteristics such as income inequality, decommodification, ethnic heterogeneity, population growth, and female labor force participation have all been identified as significant and strong predictors of homicide rates measured at the national level (see Nivette 2011; Trent and Pridemore 2012 for a comprehensive review of this literature). There have also been debates about the overrated efficacy of age structure (Rogers and Pridemore 2016a; 2016b), economic inequality (Pridemore 2008), and the underrated efficacy of poverty as measured by infant mortality rate (Messner et al. 2010; Pridemore 2008) in the explanation of cross-national homicide variation.

Although limited compared to structural explanations, extant research has explored various aspects of culture such as religiosity (Corcoran et al. 2018; Fernquist 2002; Lederman et al. 2002), religious cosmology (Jensen 2006), national religious affiliation (Chon 2017), regional difference (Neapolitan 1994; Pridemore 2002; Tuttle et al. 2018), collectivism (Fernquist 2002; Pampel and Gartner 1995), decommodification and material success goals (Alzheimer 2008; Hövermann and Messner

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2019; Jensen 2002), and culture of honor (Alzheimer 2013; Corcoran and Stark 2018) on cross-national homicide rates. However, as we will demonstrate in the next section, there remain many conceptual as well as methodological gaps in the literature on culture and cross-national homicide. For instance, culture is commonly conceptualized and operationalized as a unidimensional concept entailing nothing more than attachments to religions or religious ideas, or a series of dummy variables denoting regional difference, without further specifying the substantive cultural configurations of these supposed regional cultural differences. Scarce in the literature are studies that have tested the effects of a more comprehensive, multidimensional concept of culture appropriately measured at the *national* level. Because of the common oversimplification and mischaracterization of national culture in this literature, we move beyond previous efforts to estimate the effect of culture on cross-national homicide rates by employing a multidimensional measure of national culture that encompasses cultural values around multiple traditional institutions as well as values around modern economic and political institutions.

We extend this initial focus by also testing for a potential interaction effect between the various dimensions of national culture. As revised modernization theory (Inglehart and Baker 2000) posits, although economic modernization tends to renew some value orientations among developing countries, traditional culture remains resilient in important areas of social life. The dynamic interactions between various strands of cultural influences amidst modernization may be indicative of specific trajectories of development and may well pose an effect on the social etiology of homicide. These potential interactions have not been thoroughly investigated.

Therefore, it is the aim of this study to begin to fill some of the conceptual and methodological gaps in the literature on culture and cross-national homicide rate variation. Specifically, this study adopts a multidimensional measure of national culture based on analytic results from the World Values Survey (WVS)³ and tests the effects of this multifaceted cultural measure on cross-national homicide. Furthermore, we also test the interaction of the cultural dimensions on the cross-national variation of homicide rates while controlling for commonly included and robust structural predictors of cross-national homicide. Empirical tests are performed on a sizable sample of countries ($N = 59$), characterized by diverse levels of economic development, as well as cultural heritages, moving beyond the current focus in the literature relying primarily on developed Western countries.

LITERATURE REVIEW

The majority of the extant cross-national homicide research published in the past few decades centered around identifying salient demographic and socioeconomic predictors of cross-national homicide rates (e.g., Chamlin & Cochran 2006; Gartner 1990; LaFree 1999; Messner and Rosenfeld 1997; Pridemore 2002, 2008; Sun et al. 2011). Indeed, many of the most influential demographic and socioeconomic predictors (e.g., ethnic heterogeneity, poverty, income inequality) found to be

³ Further information about the WVS (including the survey data and methodology) can be accessed at <http://www.worldvaluessurvey.org/>.

important macro-level predictors of crime at the neighborhood and subnational levels (e.g., Moore and Sween 2015; Osgood and Chambers 2000; Pratt and Cullen 2005; Sampson and Groves 1989; Shaw and McKay 1942) are also significant at the national and cross-national levels.

However, the potential effects of culture, despite being important and found to explain a significant proportion of the variability of crime at the neighborhood (Sampson 2006; Sampson et al. 1997) and regional levels (e.g., see the two-part special issue in *Homicide Studies* 2003 and 2004), is relatively underexplored at the cross-national level. In her recent meta-analysis of cross-national predictors of homicide, for example, Nivette (2011) notes “certain ‘soft’ concepts such as trust and cultural values remain scarcely tested at the international level. ‘Soft,’ or sociocultural, predictors are measures of attitudes and perceptions, norms and values, or religious beliefs that are often considered mediators of structural variables in neighborhood-level studies.”

Much of the cross-national homicide literature typically captures culture in one single dimension, such as cosmology or religiosity, regional dummy variables, collectivism, democratic values, etc⁴. We discuss the cross-national homicide literature for these various operationalizations of culture more fully below.

Religion as Culture

The influence of religion and religiosity has remained the central focus of the cross-national homicide literature that explores the effects of culture, with mixed findings. Lederman and colleagues’ (2002) study, for example, found that religiosity (measured as the frequency of church attending and religious convictions) inconsistently predicted cross-national homicide rates across models, which led the authors to conclude that religiosity was better suited to be explored in the context of a specific religion or nation. In a similar fashion, Fernquist (2002) operationalized religiosity as the number of religious books published annually and found no effect of this measure on cross-national homicide rates. Jensen’s (2006) study refined the common approach to religiosity and instead focused on cosmology, namely the nature and origin of the universe. He found that in countries where people believed in both the benevolent God and its malevolent counterpart, the Devil, as two competing forces of the universe (or “cosmological dualism” as Jensen termed it), homicide rates were higher than in countries where people only believed in God, or in countries that are largely secular. Chon’s (2017) recent study switched the focus of this literature on individual religiosity to explore national religious affiliation and found that Muslim majority countries experienced the lowest homicide and suicide rates. Most recently, Corcoran and her colleagues (2018) hypothesized and tested for countervailing effects of religion on cross-national violence. They found that how religion was operationalized had a significant impact on the direction of the relationship. Specifically, their measure of religious intensity was found to be positively associated with cross-national rates of assault while belief in an “actual” God was negatively associated. Collectively, these studies suggest that “religiosity” is a complex concept and its ef-

⁴ An important exception are studies that examine “the culture of honor,” which is multidimensional.

fects on homicide rates remain obscure, depending on which aspect (e.g., religious intensity versus cosmology) or level (i.e., individual versus national) of religiosity is studied.

Region as Culture

In addition to dividing the world by their national religious affiliation, geographic regional difference is also explored, or at least controlled for, in several cross-national homicide studies (e.g., Neapolitan 1994; Pridemore 2002, 2008; Tuttle et al. 2018). Latin American and East Asian countries were consistently identified as the outliers when it comes to their homicide rates. Latin American countries have atypically high homicide rates and East Asian countries have atypically low homicide rates, everything else being equal. In fact, in her meta-analysis of cross-national predictors of homicide, Nivette (2011) found Latin American regional dummy variable to be the single most important predictor of cross-national homicide. Cultural variation is often offered as an explanation for these regional variations, such as *machismo* in Latin America (Neapolitan 1994; Pridemore, 2002), yet such explanations remain speculative.

To sum, regional difference as a predictor of homicide rate variation has not been operationalized in an adequately sophisticated way to meaningfully explain the connection between regional cultural and homicide rate variation. The following sections review several conceptual frameworks that tap further into the cultural mechanisms behind regional variations.

Collectivism and Democratic Values as Culture

Another measure of culture that researchers have used is the notion of “collectivism,” which assesses an individual’s relation to social institutions (Pampel and Gartner 1995). While the Collectivism Scale Pampel and Gartner (1995) used consisted of several subscales⁵, it essentially measures the extent to which a citizen can *effectively* participate in democracy. In one of the first studies to test the impact of collectivism, the authors found that among the fully democratized developed nations, a higher score on the Collectivism Scale predicts a lower homicide rate. A more recent study by Stamatel (2009) also attempted to tap into some aspects of political culture by examining the remnant effects of political violence in Eastern European countries and found that a history of political violence is indeed a significant predictor of higher homicide rates among these countries. In addition, Stamatel (2016) tested the effects of democratic values on 33 European countries and showed that democratic values had both a direct and indirect effect on homicide rates, as they were partially mediated by the strength of democratic institutions and practices.

A major shortcoming of this body of research is its limited focus on European and developed nations. Although collectivism and political violence may explain

⁵ They include subscales capturing democratic corporatism, leftist rule, consensus democracy, decommodification, and governability.

homicide variation in certain regions of the world, these empirical tests did not reveal more generalizable patterns on a global scale. Conceptually, while the collectivism scale consists of several subscales measuring various aspects of political efficacy, it did not account for values and attitudes shaped by economic modernization, as well as those shaped by traditional institutions such as religion and the family.

Material Success Goals as Culture

A classical perspective on the influence of culture on crime etiology stems from Merton's classical strain theory (1938), which posits that the pursuit of the almost universal cultural goal of monetary success pressures under-resourced groups and individuals to commit crimes as an innovated means to achieve this cultural goal. This perspective was revitalized by Messner and Rosenfeld's 1994 monograph *Crime and the American Dream*, in which the pair argued that the American Dream pushed "achievement orientation, individualism, universalism, and a peculiar form of materialism that has been described as the 'fetishism of money'" (Messner and Rosenfeld 1994).

Empirical tests of this perspective have focused on both the "imbalance" between the economic market and other social institutions (Altheimer 2008; Messner and Rosenfeld 1997), as well as the *cultural* and psychological prioritization of material success goals (Hövermann and Messner 2019; Jensen 2002). Although Messner and Rosenfeld's (1997) test of the decommodification index (an operationalization of the institutional imbalance) on cross-national homicide variation found a significant effect, Altheimer's (2008) more recent replication found that decommodification did not influence homicide rates directly; rather, ethnic heterogeneity confounds the relationship between decommodification and homicide. On material success goals, Jensen's (2002) study did not find a direct link between either the decommodification index or material success goals (as measured in the World Value Survey) on cross-national homicide rates. More recently, Hövermann and Messner's (2019) study found significant relations between marketized mentality, the degree of institutional imbalance, and the willingness to justify instrumental offenses; however, these relations have yet to be tested on homicide. To sum, although material success goals have the theoretical potential of explaining cross-national homicide variation, empirical tests have yet to provide substantial support.

Culture of Honor

Using a more complex measure, Altheimer's (2013) study examined the impact of culture of honor and found that in countries where individuals experienced "economic precariousness that causes citizens to project a determined stance of vigilance to protect their wealth and honor, and the inability or unwillingness of the state to provide protection from the predation of others," homicide rates were higher. Like collectivism, culture of honor was measured as an index consisting of people's

perceived economic precariousness, trust in others, trust in political institutions, political stability, absence of violence, and rule of law.

Although culture of honor focuses on the perceptions of both the economic as well as the political institutions, it represents a very specific intersection of these two institutions and is characteristic of only small groups of individuals in society. In other words, it remains unclear whether culture of honor is appropriate to explain homicide variation across nations, as it may be more of a subcultural phenomenon.

The Inglehart–Welzel Cultural Map as an Explanation of Homicide Variation

Although the literature reviewed thus far has explored multiple aspects of culture and their effects on shaping cross-national homicide rates, most of these studies operationalized culture in a unidimensional and monolithic manner (e.g., as religiosity or cosmology), or simply reduced them to dummy controls. The more complicated conceptualizations and measures (i.e., collectivism, material success goals, and culture of honor) also suffered from several conceptual and empirical shortcomings as noted above. No study that we are aware of has adopted a conceptually *comprehensive* measure of *national* culture (one that reflects both the influence of modern economic and political institutions, as well as traditional institutions such as religion and the family) and applied it to nations of varying developmental states.

Notably, while the limited operationalization of national culture in the extant research may be a function of data availability at the cross-national level, the WVS provides us with a way to capture national culture in a more sophisticated manner. Particularly, in this study, we adopt a multidimensional measure of national culture validated by multiple waves of data collected in the WVS, a repeated cross-sectional survey distributed across over 70 countries since 1981 (with six waves of data). Over 60,000 residents in these countries have been surveyed about issues concerning their opinions and attitudes toward various social, political, and cultural issues.

Political scientists Ronald Inglehart and Christian Welzel asserted that there are two major dimensions of cross-cultural variation in the world: (1) traditional versus secular-rational values and (2) survival versus self-expression values, both of which are captured in the WVS (see Inglehart and Baker 2000; Inglehart 2006 for a review). A description of this view on cultural variation from the WVS website defines these values as the following⁶:

Traditional values emphasize the importance of religion, parent–child ties, deference to authority and traditional family values. People who embrace these values also reject divorce, abortion, euthanasia, and suicide. These societies have high levels of national pride and a nationalistic outlook. **Secular-rational values** have the opposite preferences to the traditional values. These societies place less emphasis on religion, traditional family values, and authority. Divorce, abortion, euthanasia, and suicide are seen as relatively acceptable. (Suicide is not necessarily more common.)

⁶ Retrieved from <http://www.worldvaluessurvey.org/WVSContents.jsp> on January 30th, 2019.

Survival values place emphasis on economic and physical security. It is linked with a relatively ethnocentric outlook and low levels of trust and tolerance. **Self-expression values** give high priority to environmental protection, growing tolerance of foreigners, gays and lesbians and gender equality, and rising demands for participation in decision making in economic and political life.

Inglehart's cultural theory (Inglehart and Baker 2000) is the most recent iteration of modernization theory (Lipset 1959) and it contends that economic development leads to the liberalization of values, which, in turn, contributes to institutional changes (e.g., from authoritarianism to democracy). As much as the theory recognizes the transformative effects of economic development (modernization) on a nation's cultural outlook, the theory also maintains that national culture is highly resilient and path-dependent. That is, long-held cultural notions are resistant or slow to change.

Although research pre-dating Inglehart's study reached similar conclusions about the path dependency of national culture vis-à-vis modernization (e.g., Bell 1973, 1976; DiMaggio 1994; Putnam 1993), much of this earlier research was primarily theoretical, without empirical tests of the authors' arguments, or only focused on a select number of developed countries. It was not until the implementation of the World Values Survey that social scientists were able to empirically assess national-level cultural variations across a wide array of countries at different levels of development.

In his initial analysis of the WVS data, Inglehart (1997) started with an exploratory factor analysis of values that most effectively reflect the patterned cultural variations across countries. In time, he was able to refine the number of variables from the initial 22 to just 10 that most parsimoniously capture the variations that he discovered in his initial analysis. These items exhibit high levels of inter-item reliability and have consistently loaded onto two latent factors across several waves of WVS data. The items are summarized in Table 1.

In this study, we use the Traditional versus Secular-Rational Values Index and Survival versus Self-Expression Values Index to measure national culture. Previously, these indices have been applied to the study of cross-national variation in other outcomes, including attitudes toward homosexuality (Adameczyk and Pitt 2009) and elderly care (Mair et al. 2016), and were found to be effective in explaining global

Table 1. Survey Items Used for Creating the Cultural Indices

Traditional versus Secular-Rational Index ^a	How important is God in your life How proud of nationality Autonomy Index Justifiable: abortion
Survival versus Self-Expression Index ^b	Future changes: Greater respect for authority Justifiable: homosexuality Political action: signing a petition Post-Materialist index 4-item Feeling of happiness Most people can be trusted

^aHigher scores on this index indicate lower traditional values and higher secular values.

^bHigher scores on this index indicate lower survival values and higher self-expression values.

patterns of these attitudes and practices, indicating their utility as an appropriate measure of national culture⁷. However, they have yet to be used to explain cross-national variation in homicide, despite preliminary empirical evidence indicating that national culture is an important consideration. The availability of this data greatly enhances our ability to further explore the more complex dynamics of national culture impacting cross-national variation in homicide rates, which researchers were unable to adequately do before. Drawing on previous cross-national homicide research and Inglehart's previous research on national culture and modernization, three hypotheses are formulated and tested in this study.

Hypothesis 1 is informed by the classical Durkheimian perspective and empirical research reviewed in the previous section. According to Durkheim, homicide rates are higher where interpersonal ties as well as ties to traditional institutions are strong:

Homicide. . . is a violent act inseparable from passion. Now, whenever a society is integrated in such a way that the individuation of its parts is weakly emphasized, the intensity of collective states of conscience raises the general life of the passions; it is even true that no soil is so favorable to the development of the specifically homicidal passions (Durkheim 1997:356).

The literature reviewed in the previous section also provides empirical evidence that excessive attachment to traditional institutions, as indicated by religious intensity (Corcoran et al. 2018), for example, should predict higher homicide rates. In contrast, secular values have potentially protective effect against homicide as they weaken interpersonal bonds in industrial societies.

As for Hypothesis 2, democratic participation and higher general trust, as reflected in self-expression values, should predict lower homicide rates, as the intensity of traditional interpersonal bonds diminishes, and they are replaced by impersonal, higher-order institutions. This hypothesis is evidenced by studies of the homicide-reducing effect of democratic values and democratic participation (Pampel and Gartner 1995; Stamatel 2016). Survival values, on the other hand, should predict higher homicide rate, as research on the culture of honor (Altheimer 2013) and institutional anomie (Messner and Rosenfeld 1997) suggests.

Thus, we formulate the following hypotheses:

Hypothesis 1 Traditional values are correlated with higher homicide rates (and automatically, secular-rational values are correlated with lower homicide rates).

⁷ The authors of this study understand that "values" are only one of several pathways through which culture works in practice. While subtle, "non-declarative" (Lizardo 2017), and often times unconscious personal culture crystalizing in the forms of habitus (Bourdieu 1990), schemata, "cultural competencies" (Swidler 2013) certainly motivates a significant proportion of social actions, a strong link between "declarative" personal culture such as values, attitudes, and orientations and actions are also well documented in the empirical literature. Furthermore, social theorists have long noted the strong link between public culture (e.g., codes, frames) at the collective level and personal values at the individual level (Alexander 1992; Eliasoph and Lichterman 2003). It is these "declarative" and conscious (as opposed to latent, implicit, and unconscious) aspects of culture (i.e., values) informed by macroscopic public discourses that this study intends to examine. Opting to use "values" as a proxy for culture is not only theoretically appropriate but also methodologically practical for the transnational, macro-level analysis of this study.

Hypothesis 2 Self-expression values are correlated with lower homicide rates (and automatically, survival values are correlated with higher homicide rates).

In addition to their individual effects, we suspect that the interaction of these two cultural indices may also influence the cross-national incidence of homicide. As demonstrated in Figure 1, each country's scores on these indices constitute their coordinates on the Inglehart–Welzel Cultural Map. “Cultural clusters” can be visibly identified on the map. These empirically induced clusters of national culture (indicated by the interaction of the two cultural indices) may predict variation in homicide rate. For instance, more religious and traditional countries which simultaneously prioritize political freedom over economic survival or growth may easily succumb to the “homicidal passions” enabled by strong interpersonal ties and an individualist freedom of expression. These interactive effects have not been previously explored in the literature as this study represents the first effort to apply the Cultural Map to the study of cross-national homicide variation. This leads to our third hypothesis. Hypothesis 3 goes a step further to explore whether the unique permutation of the two cultural indices has an effect on a country's homicide rate, based on the overlapping patterns between the Cultural Map and global homicide rate distribution:

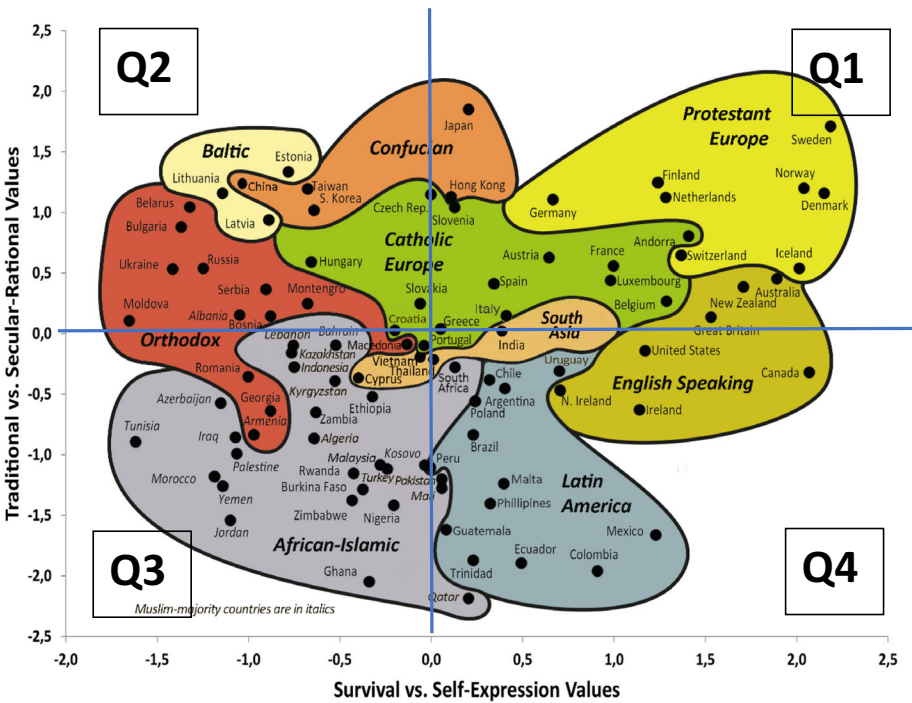


Fig. 1. The Inglehart–Welzel Cultural Map, World Values Survey—Wave 6 (2015). [Color figure can be viewed at wileyonlinelibrary.com]
Source: www.worldvaluessurvey.org

Hypothesis 3 As traditional values grow stronger, the strength of the relationship between the survival versus self-expression cultural dimension and homicide rates should decrease.

THE CURRENT STUDY

We build on the existing literature by examining a comprehensive measure of national culture, as well as the potential interactions between various dimensions of national culture. These multidimensional and interactive measures of national culture are important to consider because they are indicative of the specific developmental trajectory of a country. Furthermore, many cross-national studies of homicide used relatively small and homogeneous samples of countries. It is the aim of this study to contribute to these gaps in the cross-national homicide literature by (1) introducing and testing the effects of a multidimensional measure of national culture on the cross-national variation of homicide, (2) exploring the potential interactions between these two dimensions of national culture, and (3) performing the analyses on a sample of countries characterized by wide-ranging levels of economic development and a variety of cultural traditions.

METHODOLOGY

Dependent Variable

To test our hypotheses, we created a data set with the national homicide rate as the dependent variable. The homicide rates in this study were drawn from the World Health Organization's (WHO) global homicide estimates, which is considered to be the most reliable estimate of global homicide rates (e.g., Kanis et al. 2017; LaFree and Tseloni 2006; Neapolitan 1994; Nivette 2011; Tuttle et al. 2018). We used the average homicide rate over a 6-year span, from 2010 to 2015 to increase our sample size and to minimize fluctuations due to year-to-year anomalies, which is also common practice in macro-level research (e.g., Borg and Parker 2001; Krivo and Peterson 1996; Morenoff et al. 2001). This resulted in a sample size of 59 countries. The homicide rate was log-transformed to overcome the common issue of skewness in homicide data. After the log-transformation, no extreme outliers (defined as three times the interquartile range below the lowest value or above the highest value) were detected in the dependent variable.

Independent Variables

In consideration of the importance of time order in establishing causal validity, all our independent and control variables were drawn from the time period between 2010 and 2014 (with the exception of the cultural indices; see below). In this study, we strive to capture the dependent variable and the independent and control variables as concurrently as possible to optimize causal validity.

National culture: Our key independent variables capture culture at the national level. They include: (1) Traditional-Rational/Secular Index and (2) Survival-Self-Expression Index. Both indices were drawn from the calculated indices based on Wave 5 (2005–2009) and Wave 6 (2010–2014) of the WVS data. Some countries participated in both waves and some only for one of the two waves. In cases where data for both waves were available, the means of the indices were calculated and used for analysis in this study. We chose these years to temporally precede the dependent variable and we chose two waves instead of one to increase our sample size. Using only Wave 6 data would have reduced our sample size substantially, to only 46 cases. Table 1 summarizes the specific survey items that go into each index. A higher score on the Traditional-Rational/Secular Index indicates weaker endorsement of traditional values and stronger endorsement of secular values; a higher score on the Survival-Self-Expression Index indicates weaker endorsement of survival values and stronger endorsement of self-expression.

Cultural interaction term: To test our third hypothesis, we also created an interaction term between the two cultural indices, using their standardized z scores (which avoids introducing multicollinearity).

*Control Variables*⁸

Economic Development Index (EDI): The EDI is a factored index (standardized score weighted by factor loadings) constructed using six variables: Inequality Adjusted Human Development Index (IHDI), percentage of urban population, percentage of males aged 15–29, percentage of Internet users, percentage of cellphone users, and infant mortality rate (inversely weighted). These variables have been found to be significant developmental predictors of homicide rates across countries (e.g., Chon 2017; He et al. 2003; Pridemore 2008; also see Nivette 2011 and Trent and Pridemore 2012 for comprehensive reviews).

IHDI was measured as the mean of inequality adjusted HDIs between 2010 and 2014, drawn from the Human Development Reports compiled by the United Nations Development Program (UNDP). It is a composite index of life expectancy at birth, expected years of schooling, mean years of schooling, and GNI per capita (PPP dollar), meanwhile adjusting for the overall loss to human development due to inequality. The percentage of the population that had the internet and rate of cell phone subscriptions also came from 2010 to 2014 averages from the UNDP. Percentage of urban population, as well as percentage of male population aged 15–29, were both means calculated with data from 2010 to 2014 in the World Bank Health Nutrition and Population Statistics (HNPS). Infant mortality rate was the mean

⁸ As discussed in our literature review, religiosity is an important variable that has been tested in the past. We tested a measure of religiosity available in Wave 5 and Wave 6 of the WVS, which provided the percentage of respondents who deemed religion as “very important” in their life. We did not find any significant association between the religiosity measure and the log-transformed homicide rate, after including it in our baseline models. We chose not to include these results in the manuscript due to page limit and to limit the number of independent variables, but we are happy to share them should anyone become interested in these results.

infant mortality rate between 2010 and 2014 drawn from WHO Global Health Observatory data.

We use a factored index rather than including all these variables individually to avoid potential multicollinearity (the absolute values of the correlation coefficients between these variables, which were all statistically significant at the .01 level, ranging from .40 to .92), as well as reduce the number of variables in the model, given our already relatively small sample size. Although debates exist among different researchers (e.g., Pridemore 2008; Rogers and Pridemore 2016a, 2016b; Santos et al. 2017) on the causal validity of these individual variables (e.g., poverty and percent young) in cross-national homicide research, the purpose of this paper is to examine the effects of national culture while acknowledging the need to control for these well-established economic and structural influences. The exploratory factor analysis (Principal Component Analysis with varimax rotation) indicated that all six variables loaded onto one single dimension with factor loadings of at least .71 and an Eigenvalue of 3.87 (explaining 75.0% of the variance). This approach has also been taken in other cross-national homicide studies (e.g., Tuttle et al. 2018). Cronbach's Alpha registered at .79, indicating good inter-item reliability.

Gini index: Gini Index is a measure of income inequality on a scale from 0 to 100 and is used in this study to control for relative deprivation. Scores of 0 indicate complete equality and scores of 100 indicate complete inequality. It is important to note that this measure did not load with the other structural factors included in the EDI. In this study, we primarily use the mean Gini Index between 2010 and 2014 estimated by the World Bank. When World Bank data were unavailable for specific countries, we supplemented data from the World Income Inequality Database, 2010–2014.

*Ethnic fractionalization*⁹: Our measure of ethnic fractionalization was taken from Alesina and colleagues' (2003) calculation, based on the following formula $FRACT_j = 1 - \sum_{i=1}^N S_{ij}^2$, where S_{ij} is the share of ethnic group i ($i = 1 \dots N$) in country j . The demographic data on the number of ethnic groups in each country were collected from several sources including the Encyclopedia Britannica, CIA, Levinson, World Directory of Minorities, and others. Although the data were collected almost a decade before most of the other variables, it can be assumed that the number of ethnic groups in a country remains relatively stable over a decade.

Population size: We also include a measure of total population size (log-transformed) as a control variable, since the countries included in this study vary significantly in population size, and previous research has indicated its potential importance. This

⁹ Although we include ethnic fractionalization as a control variable, we are aware of the conceptual shortcomings of this measure as applied to cross-national research: racial and ethnic differences are perceived very differently within the context of each country (which challenges the calculation of inter-group difference solely on the basis of group numbers), and ethnic minorities may be concentrated in certain regions of a country where heterogeneity within those regions may not reflect the overall heterogeneity of the country. Nevertheless, we included this measure as it was identified as a significant predictor in the literature (Nivette 2011).

measure also did not load with the EDI. Statistics were drawn from World Bank HNPS data, 2010–2014.

RESULTS

Descriptive Statistics

Table 2 summarizes the descriptive statistics of all the variables included in this study. As is shown, the countries included in this study exhibit robust variability in terms of their economic, demographic, as well as cultural characteristics. There is also a great deal of variability in the homicide rate of each country.

Bivariate Analysis

Table 3 summarizes the bivariate correlations between all the independent and control variables and the dependent variable. As is demonstrated, our independent variables of interest (i.e., the cultural indices and their interaction) are significantly and negatively correlated with the dependent variable. Among the structural controls, the EDI (–), Gini index (+), and ethnic fractionalization (+) are also significantly correlated with the dependent variable. Each of these significant bivariate correlations is in the expected direction.

Multivariate Analysis

Table 4 summarizes the results from multivariate OLS regression analyses, where we entered our independent variables of interest and control variables in blocks. Model 1 includes only the structural and demographic controls. The EDI (–), Gini Index (+), and ethnic fractionalization (+) were statistically significant predictors of cross-national variation in homicide rate in the baseline model. The EDI and the Gini index remained significantly and negatively related to cross-national homicide rate from the baseline through the full model, while ethnic fractionalization positively predicted cross-national homicide rate variation in Models 1 and 2 only. In Model 2, we added the Cultural Indices. On their own, neither of the two

Table II. Descriptive Statistics for All Variables (N = 59)

	Mean	SD	Min	Max
Homicide rate (log-transformed)	1.37	1.21	–0.92	3.95
Economic Development Index (EDI)	0.00	1.00	–2.23	1.46
Population size (log-transformed)	17.07	1.52	13.94	21.02
Gini index	37.28	7.97	24.70	63.20
Ethnic fractionalization	.37	.24	.002	.78
Traditional-Secular-Rational	–.07	.60	–1.09	1.25
Survival-Self-Expressive	.00	.59	–.95	1.60
Trad-Rat*Surv-Self	.40	1.14	–1.39	5.89

Note: the interaction term Trad-Rat*Surv-Self was created by multiplying the centered cultural indices.

Table III. Bivariate Correlations Matrix of All Variables (N = 59)

	1	2	3	4	5	6	7	8
1 EDI	1.00							
2 Logged Population Size	-.15	1.00						
3 Gini Index	-.37**	.26*	1.00					
4 Ethnic Fractionalization Index	-.54**	.12	.39	1.00				
5 Traditional-Secular-Rational	.69**	-.10	-.50**	-.51**	1.00			
6 Survival-Self-Expression	.53**	.07	-.10	-.33**	.42**	1.00		
7 Trad-Rat*Surv-Self	.27*	-.16	-.33*	-.35**	.30*	.55**	1.00	
8 Logged Homicide Rate	-.65**	.10	.60**	.60**	-.67**	-.32*	-.43**	1.00

**p* < .05,
 ***p* < .01.

Cultural Indices significantly predicted homicide (and thus Hypotheses 1 and 2 are rejected). Their interaction, however, was a significant predictor in Model 3 (supporting Hypothesis 3). Model 3 substantially improved upon Model 1 in terms of its explanatory power (i.e., adjusted r-squared). Overall, the interaction of the cultural variables (of the utmost theoretical interest to this study) appears to be a robust predictor of cross-national homicide rates. Multicollinearity did not appear to be a problem, as the VIFs for all of the variables were below 3, with 2.64 being the highest. The Breusch–Pagan test indicated that the constant variance assumption was not violated and as such, there were no problems with heteroscedasticity.

Further Analysis of the Interaction Effect

Although Hypothesis 3 is supported in our regression analyses, the interpretation of the effect of the interaction term remains obscure given the inherent difficulty in interpreting interaction terms of two continuous variables, especially when the main effects are non-significant. Upon analyzing the interaction term by country, we created a series of dummy variables reflecting each country’s quadrant position on

Table IV. OLS Regressions on Log-Transformed Homicide Rates (N = 59)

	Model 1		Model 2		Model 3	
	Beta	SE	Beta	SE	Beta	SE
EDI	-.38**	.12	-.29*	.16	-.35*	.16
Population Size (log-transformed)	-.09	.07	-.08	.07	-.12	.07
Gini Index	.38**	.01	.33**	.02	.27*	.02
Ethnic Fractionalization	.26*	.52	.24*	.52	.20	.51
Traditional/Religious-Rational/Secular			-.20	.26	-.20	.25
Survival-Self-Expressive			.03	.21	.17	.24
Trad-Rat*Surv-Self					-.23*	.11
Adjusted R ²	.59**		.60**		.63**	

Note: VIFs of all variables in all models are below 3; highest VIF = 2.64.
 **p* < .05,
 ***p* < .01.

Table V. List of Countries by Quadrants (N = 59)

	Quadrant 1	Quadrant 2	Quadrant 3	Quadrant 4
	Australia	Bulgaria	Armenia	Morocco
	Finland	China	Burkina Faso	Pakistan
	France	Estonia	Cyprus	Peru
	Germany	Hungary	Ethiopia	Romania
	Italy	Republic of Moldova	Georgia	Rwanda
	Japan	Russian Federation	Ghana	Thailand
	Netherlands	Serbia	Guatemala	Tunisia
	Norway	South Korea	India	Turkey
	Slovenia	Ukraine	Indonesia	Vietnam
	Spain		Iraq	Poland
	Sweden		Jordan	South Africa
	United Kingdom		Kazakhstan	United States
			Kyrgyzstan	Uruguay
			Lebanon	
Mean Traditional-Rational Index	.66	.55	-.48	-.39
Mean Survival-Self-Expression Index	.81	-.44	-.39	.32
Mean Log-Transformed Homicide Rate	-.12	1.09	1.73	2.27

the Cultural Map (illustrated in Figure 1) and used them to render the results in Table 4 more interpretable.

As is summarized in Table 5, Quadrant 1 includes countries that score positively on both the Traditional-Rational (T-R) Index and the Survival-Self-Expression (S-S) Index (i.e., endorsing stronger secular values and stronger self-expression values). Quadrant 2 consists of countries that score positively on the T-R Index and negatively on the S-S Index (i.e., endorsing stronger secular values and stronger survival values). Quadrant 3 is made up of countries that score negatively on both indices (i.e., endorsing stronger traditional and stronger survival values). Quadrant 4 are countries that score negatively on the T-R Index and positively on the S-S Index (i.e., endorsing stronger traditional values and stronger self-expression values). Based on our hypotheses for the individual cultural dimensions, we would expect Quadrant 1 to have the lowest mean homicide rates and Q4 to have the highest mean homicide rates, which is confirmed in Table 5.

Next, we replaced the Cultural Indices and their interaction term with a dummy variable where a value of 1 signifies a country being in one of the four quadrants. We then ran four separate models with each quadrant dummy. Table 6 summarizes these results.

As is demonstrated in Models 4 through 7, Quadrant 1, 3, and 4 significantly improved the explanatory power of the baseline model (Model 1) (from 59% to 62%, 61%, and 65%, respectively), with Quadrant 4 (+) significantly predicting higher log-transformed homicide rates (Model 7). Model 7 also explained the greatest amount of variability of the dependent variable (65%) across all models. Multicollinearity did not appear to be a problem, as the VIFs for all of the variables were below 2. The Breusch–Pagan test indicated that the constant variance assumption was not violated. The EDI (–) remained the most consistent predictor of log-transformed homicide rates and the Gini index remained significant (+) until Quadrant 4 was included in the model, suggesting a potential mediation effect. Ethnic fractionalization also statistically significantly (+) predicted the log-transformed homicide rate with the exception of Model 4 (where Quadrant 1 was included).

Table VI. OLS Regressions on Log-Transformed Homicide Rates (N = 59)

	Model 4		Model 5		Model 6		Model 7	
	Beta	SE	Beta	SE	Beta	SE	Beta	SE
EDI	–.29*	.14	–.39**	.13	–.50**	.16	–.45**	.12
Population Size (log-transformed)	–.07	.07	–.09	.07	–.11	.07	–.10	.06
Gini Index	.34**	.01	.39**	.01	.34**	.01	.21	.02
Ethnic Fractionalization	.21	.52	.25*	.52	.27*	.52	.26**	.48
Quadrant 1	–.21	.32						
Quadrant 2			.05	.29				
Quadrant 3					–.17	.28		
Quadrant 4							.28**	.28
Adjusted R ²	.62**		.59**		.61**		.65**	

Note: VIFs of all variables in all models are below 2; highest VIF = 1.92.

**p* < .05,

***p* < .01.

DISCUSSION AND CONCLUSION

Building on the recent literature on culture and the cross-national incidence of homicide, this study contributes to the literature by testing multiple multidimensional measures of national culture and the interaction between these two dimensions on homicide rates across 59 nations characterized by wide-ranging levels of economic development and cultural traditions. The findings of this study first and foremost affirm the role national culture plays in shaping homicide rates across nations, a concept that has, until now, not been captured in a multidimensional, comprehensive manner.

Theoretically speaking, the findings of this study partially support, yet simultaneously complicate the classical Durkheimian thesis that excessive attachment to traditional institutions may result in a higher homicide rate: the effect of attachment to traditional institutions on national homicide rates is indeed extant and salient, but only among countries in the Fourth Quadrant characterized by persistent traditionalism *and* a strong appreciation for individual and political freedoms. Analyses in this study show that the cultural effect on homicide rate variation across nations is most notably expressed by the interaction of the two dimensions of national culture. The rejection of Hypotheses 1 and 2 (i.e., the effects of the stand-alone Traditional-Rational Values Index and the Survival-Self-Expression Index) in this study affirms previous research documenting mixed findings of the cultural effects of traditional institutions such as religion on homicide (Chon 2017; Corcoran et al. 2018; Fernquist 2002; Jensen 2006; Lederman et al. 2002). The significant effect of the interaction term as well as the quadrant dummies, in contrast, reveals that it is perhaps the acute *tension* between traditionalism and an increasing appreciation for individual and political freedom, experienced by countries in Quadrant 4, that is homicidogenic. The struggle with the competing and sometimes contradicting imperatives of economic modernization, traditionalism, and political liberalization has resulted in the highest average homicide rate among these countries.

The findings also complicate the argument of orthodox modernization theory (e.g., Lipset 1959), which posits that economic modernization will inevitably lead to other types of social and political “progresses.” The findings of this study show that as countries develop, many of them experience a period of struggle between the traditional and the modern manifested in this study as the disparate scores on the two cultural indices, representing two dimensions of cultural development. For some countries at least, economic growth during this stage does not automatically result in a linear progression of a society’s cultural values toward liberalization. Traditional culture continues to play a significant role at this stage in some countries, sustaining traditional ties and fueling the “homicidal passions” that Durkheim (1997) referred to. Meanwhile, the acquisition of post-materialist values (such as individualist and democratic values) seems to have exacerbated the homicidogenic tendency of traditional culture. This explains why national homicide rates are higher among countries in Quadrant 4 than those in other quadrants. In addition to revealing group patterns, these findings also offer contextualization to studies on homicide in specific regions of the world such as Latin America (e.g., Pridemore 2002; Tuttle et al. 2018; Weiss

et al. 2016), which is characterized by strong bonds to traditional institutions such as religion and family as well as a deep appreciation for individual freedom.

Empirically, the findings of this study further refine our knowledge about the role of culture on cross-national homicide comparisons. As is demonstrated, the Traditional-Secular/Rational Index is a more robust measure of mass loyalty to traditional institutions than religiosity, which may explain why the effect of religiosity on homicide has been inconsistent in the literature (Fernquist 2002; Lederman et al. 2002). The testing of the interaction effect fills another gap in the existing empirical literature where religiosity and political freedom (e.g., Messener and Rosenfeld 1997; Stamatel 2009, 2016) were never explored *together* through the lens of modernization, and the statistical significance of the interaction effect affirms the importance of further exploring these cultural and developmental connections.

Practical and policy implications may also be drawn from these findings. It seems that violence prevention efforts in countries with the highest homicide rates in the world may include attempts to weaken ties to traditional institutions such as religion and family, perhaps by providing more secular education and *meaningful* opportunities in secular social institutions. Such education and opportunities should especially be made available to women whose empowerment with independence from traditional institutions would foreseeably have a more direct and significant impact.

Several limitations of this study and future research directions are also discussed here. First, the authors are aware that although most cross-national homicide research utilizes similar or smaller samples of countries¹⁰, a larger sample size would enable further analyses. Considering the current sample size, the authors had to be strategic and calculative in deciding which control variables to include, and we opted to prioritize the EDI and the Gini Index because those were the most commonly tested structural predictors in the cross-national homicide literature (Nivette 2011). Additionally, we ran into difficulty in including some theoretically and empirically relevant variables, such as divorce rate, as there were too many missing data points in the pool of countries that we sampled. We chose not to fill in these missing cases with data from before or after the timeframe of the dependent variable, as we prioritized maintaining the temporal consistency for the purpose of maximizing causal validity. Finally, although evidence from this study strengthens the perspective of revised modernization theory (Inglehart and Baker 2000), the cross-sectional design of this study limits the generalizability of its findings and should not be taken as direct evidence for the revised modernization theory. Longitudinal data are necessary to robustly test these connections. Despite these limitations, this study has gone a long way in illustrating the increased focus future researchers should place on examining the role of culture on cross-national homicide rate variation, and we encourage other researchers to continue investigating these important cultural dimensions.

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¹⁰ The average sample size is 44 countries (Nivette 2011), while ours is 59.

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