Cross-national interaction and cultural similarity: A relational analysis

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Abstract

The study examines the relationship between the structure of cross-national relations and the dyadic cultural similarity of 19 countries over 10 years, based on the assumption that patterns of interaction between state, private sector, and civil society actors influence national cultures. The relations analyzed include trade, military alliances, IGO memberships, phone calls, and military conflicts. The findings demonstrate that cross-national interactions, particularly trade and IGO memberships, are strong predictors of cultural similarity that complement the modernizing effects of economic development. In addition to explaining variation in cultural similarity between country dyads, the study challenges primordialist approaches to comparative cultural research that rely on civilizational country classifications. Instead, systematic measures of religious tradition, geographic region, linguistic heritage, and imperial history are used to identify factors that shape countries' dyadic cultural similarities. Of these, only membership in former empires is a significant predictor of cultural similarity.

Keywords

Introduction

As is often the case with topics that gain rapid salience in public discourse, debates about the significance of globalization have been characterized by a great deal of sensationalism, often based on claims with questionable empirical support. Global integration has frequently been depicted as either the utopian precursor of a new world culture or a catalyst for international cultural conflict between defenders of traditional values and forces of secular modernization (Barber, 1995; Friedman, 1999; Huntington, 1993). The integrationist camp has itself been split between proponents of cultural convergence (Levitt, 1983; Ohmae, 1990) and critics who equate it with Western cultural imperialism (Ritzer, 1993). Although all of these disparate claims have been successful at capturing the public imagination, few of them have engaged the topic of cultural globalization in a systematic and empirically rigorous manner. This is as true for sociological scholarship as it is for popular media accounts: the cultural consequences of global integration continue to be sociologically under-theorized and under-researched.

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In an effort to address this problem, this article uses data from the World Values Survey to analyze and explain relative changes in the aggregate attitudes of 19 national populations over 10 years. The research is motivated by the overarching question of how historical legacies, development trajectories, and contemporary interactions between countries influence the cultural similarities between their populations. In addressing this question, the article will build on the influential work of Inglehart and Baker (2000) concerning the impact of modernization and civilizational heritage on cultural change.

Globalization and culture

It is undeniable that global and regional integration has had important cultural consequences. However, the actual nature of these consequences has been hotly debated. The main question is whether globalization results in the convergence of national cultures, either toward a Western or transnational model, or in a cultural fragmentation that may have potentially dangerous geopolitical repercussions.

The notion of cultural convergence can be traced back to modernization theory (e.g. Schram, 1964), which posited that economic development was intrinsically coupled with cultural change. Modernization theory foresaw and encouraged the diffusion of Western political and economic principles to developing regions of the world in an effort to bring them in line with the standards of the developed world. This perspective has been strongly challenged by world-systems scholars for its uncritical acceptance of Western economic and political dominance (Wallerstein, 1974). However, the historical materialist roots of world-systems theory have precluded it from engaging seriously with the question of cultural change.

Other critical scholars have accepted the main tenets of modernization theory but have inverted its normative stance by extending mass culture theory of the Frankfurt School to the world system (Lizardo, 2007). Instead of celebrating the diffusion of the Western cultural model, they warn of the imminent destruction of local customs around the world by Western cultural imperialism (e.g. Ritzer, 1993; Schiller, 1993). This perspective assumes that cultural consumption serves the interests of hegemonic power by indoctrinating the masses with an ideology that justifies their oppression.

Much as the mass culture theory of the Frankfurt School was challenged on empirical grounds by audience reception studies, its globalized version has been successfully critiqued by qualitative sociologists and anthropologists for whom globalization gives way to glocalization – the adaptation and reinterpretation of foreign (or global) cultural objects to local conditions (Appadurai, 1996; Cowen, 2004; Van Der Bly, 2007). As is typical of the postmodern tradition in cultural studies, this perspective emphasizes the agency of the subaltern cultural consumer but fails to produce a coherent theory of global cultural diffusion. In a more systematic challenge to the cultural imperialism thesis, Lizardo (2007) employs DiMaggio's (1987) 'socio-structural' perspective to argue that countries of the semi-periphery and periphery are actually net exporters of culture, while those in the core are net importers, and that one of the fundamental characteristics of global culture is its high level of differentiation.

Global cultural convergence has also been predicted by world polity institutionalists (Meyer, 2007; Meyer et al., 1997, 2010). This perspective emphasizes the emergence of a new global culture based on modern notions of personhood and universal human rights embedded in the democratic nation-state. Rather than considering these ideas to be functional correlates of national economic development, world polity theory views them as emergent from the supranational institutional structure, formed by intergovernmental and non-governmental organizations. As countries join global political and economic networks, they adopt modern institutional scripts, such as flags,

anthems, and national currencies, and implement standardized state policies, such as constitutions, mandatory mass education systems, and specialized ministries. Personhood itself undergoes a universalistic transformation as well, as individuals are increasingly defined as distinct, rights-bearing, and knowledge-wielding (and knowledge-building) actors. The principles that define nationhood and personhood are not necessarily economically or politically functional – they are adopted primarily to signal legitimacy within an increasingly global and homogenous cultural system.

In contrast to theories of cultural convergence, a number of scholars have argued that global integration is leading to cultural fragmentation. In this perspective, distinct cultures bounded by national and regional borders are set on a collision course. One side of the struggle is represented by developed countries, which are increasingly secular and consumerist, and the other by traditional societies that embrace religion and reject free-market capitalism (Barber, 1995; Friedman, 1999). In the most alarmist version of this approach, cultural divergence is predicted to result in a global 'clash of civilizations' (Huntington, 1993). This perspective has generated considerable criticism over the last decade for treating world cultures as internally homogenous and immutable. Nonetheless, Huntington's civilizational typology continues to influence researchers in sociology and political science.

A middle ground?

In an attempt to reconcile the convergence and fragmentation camps, Inglehart and Baker (2000) argue that globalization does lead to global convergence around the Western cultural model but that the process is mediated by nations' path dependence on their civilizational heritage. If the latter hypothesis is true, they argue, it should be possible to map the various regions of the world cultural system based on the common cultural heritage of the countries that constitute those regions. Because Inglehart and Baker's article is foundational for the present study, I will describe it in some detail.

Following Inglehart's past work on the rise of postmaterialist values, the authors distinguish two main axes of cross-national cultural differentiation: traditional versus rational-secular and survival-oriented versus self-expression-oriented. They produce two corresponding scales of cultural polarization using a factor analysis of 10 variables from the World Values Survey, which are aggregated at the country level. The scores for the 65 countries in the sample are then plotted in a two-dimensional space defined by the two scales. Since rich nations seem to be clustered in the upper-right corner of the graph (which represents secular-rational and self-expression-oriented values), Inglehart and Baker (2000: 29) conclude that 'economic development seems to have a powerful impact on cultural values'. The mapping of regions based on GNP levels and labor force composition onto the graph seems to support this argument. These findings lend credence to the convergence thesis rooted in the logic of modernization theory.

Next, the authors use a modified version of Huntington's (1993) civilizational typology to identify 'cultural zones' in the graph. These cut across measures of economic development, but are fairly clustered; for instance, all 'Confucian' countries score high on the secular-rational dimension and are in the middle of the distribution along the survival/self-expression dimension. The authors conclude that cultural heritage continues to shape countries' values even in the face of growing cultural convergence. To further test their claims, Inglehart and Baker regress the two dimensions of cultural polarization on a set of economic variables and cultural zone dummies. The coefficients for the cultural zone dummies are significant, even after controlling for GDP, labor force composition, and educational participation, which the authors interpret as evidence for the zones' validity.

Inglehart and Baker make an important contribution to the literature by offering a middle-ground alternative to the two established positions in the cultural globalization debate. However, the study contains a number of conceptual and methodological shortcomings that need to be addressed before any conclusive judgments can be made about the relationship between global integration and cultural change.

First, the cultural typology borrowed by the authors from Huntington (1993) has been widely criticized. Inglehart and Baker's decision to begin their analysis with a set of pre-conceived cultural regions is problematic, especially given that this classification is based on a seemingly arbitrary mix of religious, philosophical, geographic, linguistic, and political criteria. Furthermore, grouping countries into discrete regions fails to take advantage of the factor analytic methods used by the authors, which generate scores for each country on each of the two dimensions of culture. To produce more precise results and reduce the risk of subjective bias, the authors could have relied on other methodological approaches, such as those capable of directly analyzing the continuous distances between countries in the Euclidian space defined by the two factor scales.

Second, Inglehart and Baker state in their article that modernization theory was primarily concerned with national characteristics, while more contemporary approaches, such as world-systems theory, tend to emphasize *relations* between different nations. Yet, the authors never examine the effects of the countries' positions in the system of global flows on their cultural similarity. It is conceivable that the Huntingtonian cultural zones are proxies for the structure of cross-national relations; whether or not this is the case is an empirical question. The emphasis on national units also leads the authors to an essentialist view of national values, which ignores internal variation. Yet, the degree of within-nation variation could be an important indicator of cultural change, which is likely to be highly sensitive to the extent of a country's embeddedness in the world system.

Third, the analysis of change in the article fails to exploit fully the available evidence. Conclusions about causes of change are based on interpretations of a single cultural map (i.e. a scatterplot defined by the two cultural dimensions), which simultaneously shows countries' positions at two time points. This ignores the largest advantage of the World Values Survey data – their repeated cross-sectional structure, which makes it possible to construct a panel data set at the country level. Without rigorously analyzing patterns of change in the data using multivariate models, it is difficult to make conclusive arguments about the sources of cross-national cultural variation.

A relational view of global cultural change

The central argument in the present article is that globalization does in fact produce cultural change, but that this change is not necessarily linear or unidirectional. Popular attitudes are shaped not only by economic development, but also by ongoing cross-national interactions among individuals and organizations embedded in global economic, political, and migratory networks. Since these networks change continually, so do the national cultures within which global actors operate. Throughout the article, I will refer to this network-based explanation of cultural change as the 'contact hypothesis'.

The analysis will draw on the main perspectives in the globalization debate, while avoiding simplistic claims about global cultural integration or fragmentation. My strategy of forging a middle-ground position builds on the work of Inglehart and Baker. However, by employing a relational approach to comparative research I hope to better explain the cross-sectional and dynamic variation in the popular attitudes of survey respondents from 19 countries featured in three successive waves of the World Values Survey. Specifically:

1) Instead of using a priori cultural typologies to categorize nations into cultural zones, I will directly and systematically evaluate the effects of countries' shared historical heritage on their cultural similarity. I will examine the four criteria that make up the cultural zone scheme: linguistic families, religious traditions, geographic regions, and past imperial memberships.

2) Rather than explaining the attitudes of national populations using the attributes of individual countries, I will rely on relational methods that will enable me to simultaneously evaluate the importance of countries' attributes, their membership in groups defined by common historical heritage, and their dyadic relations. In this framework, my dependent variable will not be the absolute location of a country in the two-dimensional cultural space generated by factor analysis, but rather the Euclidian distances between all pairs of countries in the data set. To test the hypothesis that the structure of the system of cross-national relations has an important impact on the attitudes espoused by national populations, I will construct a multiplex network of international interactions and examine its effect on popular attitudes.

3) To identify the dynamic mechanisms that produce cultural change over time, I will take advantage of the panel structure (at the national level) of the World Values Survey data. I will analyze changes in the cultural similarities of countries over a 10-year period using fixed-effects models, which take into account unobserved time-invariant variables specific to each country dyad, as well as unobserved period-specific effects that may simultaneously impact all dyads (e.g. global economic recessions).

Mechanisms of cultural change

My central claim is that national populations that frequently interact with one another are likely to be more similar culturally than those that do not. The dynamic corollary of this cross-sectional hypothesis is that increased interaction among countries leads to cultural convergence. This process does not preclude some version of a modernization process, whereby nations become more culturally similar as they experience economic growth. However, I argue that we should observe significant effects of cross-national interactions even after we control for economic development. There are three mechanisms through which culture may diffuse between nations: institutional contact, network diffusion, and cultural production and consumption. The first two are consistent with one of the central findings in research on social networks that 'the set of ideas one holds to be true is largely a function of the group of people one interacts with and references to authorities recognized by the group' (Moody, 2004), while the third has been posited by both modernization and media imperialism theories and challenged by anthropological research and media reception studies.

Institutional contact

Organizations that interact with one another are likely to borrow each other's solutions to commonly encountered problems. This process, known as institutional isomorphism, is central to neo-institutional organizational theory (DiMaggio and Powell, 1983) and world polity institutionalism (Meyer et al., 1997). As described earlier, the latter perspective holds that international organizations are carriers of global cultural scripts that dictate how nation-states should behave and how modern personhood should be conceptualized. Nations that wish to be part of the global community are forced to enact these scripts, regardless of whether or not they serve practical political and economic functions. Most recently, this process has been shown to operate in the domains of political democratization, as countries with more democratic network alters themselves become

more democratic over time (Torfason and Ingram, 2010), and anti-terrorism law, as UN Security Council resolutions introduced after 9/11 have prompted member states to adopt sweeping reforms to their domestic security policies (Scheppele, 2008).

This perspective can be extended to popular attitudes under the assumption that there is a link between institutional scripts, which prescribe both symbolic and instrumental practices, and individual attitudes. This assumption is reasonable given DiMaggio's (1997) argument that individual cognitive schemata and supra-individual culture are in constant interaction. Even if institutional contact between nations does not translate into an exact replication of cultural scripts by the nations' respective populations, we can expect the attitudes prevalent among them to be more similar to one another than would be the case in an unconnected country dyad.

The institutional interactions that shape globalizing processes can be classified into three domains: the economy, politics, and civil society. Economic interactions occur at the level of business organizations and industries and involve the trade of goods and services; political interactions occur at the level of states and inter-governmental organizations (IGOs) and involve policy negotiation, diplomatic relations, and military conflict; and civil-society interactions occur at the level of international non-governmental organizations (INGOs) and tend to involve the exchange of knowledge, skills, and material support. All three types of cross-national interaction should be correlated with cultural similarity.

Social network diffusion

Cultural knowledge has been shown to serve an important role in micro-level interaction rituals (Bourdieu, 1984; Collins, 2004; DiMaggio, 1987). It is used both as a 'source of common contents of sociable talk' (DiMaggio, 1987: 443) and as a means of delineating status group boundaries (Bourdieu, 1984). The act of sharing cultural preferences (including attitudes and beliefs) in the course of interaction rituals leads to the diffusion of culture from one individual to another. Since individuals are interconnected by extensive networks of social ties, the scope of this diffusion is potentially far-reaching (Friedkin, 1998). This model has been used to study the transmission of information across geographic distance (Watts and Strogatz, 1998), the spread of voluntary organization memberships (McPherson, 1983), and the diffusion of musical tastes in the population (Bonikowski, 2005; Mark, 1998).

The increased movement of people across national boundaries is one of the key aspects of contemporary globalization. People travel extensively for work, education, and pleasure and in so doing, they come into contact with cultural difference. When they return to their home countries, they carry with them a set of new cultural scripts, some of which may diffuse into the larger population. Although data limitations prevent me from examining migration patterns directly, I do have access to a single wave of data on international phone calls. These data may capture some dimensions of the cross-national cultural diffusion process.

Cultural production and consumption

The final mechanism through which culture can spread across national borders is the exposure of populations to foreign cultural products. Although this topic has received the most attention in the cultural globalization literature, the debate has generated few systematic theoretical models and consistent empirical findings. If a conclusion can be drawn from the debate between proponents of modernization theory and media imperialism theory, it is that cultural consumption is a contingent process in which consumers play at least as large a role as producers.

Although lack of data prevents me from directly testing hypotheses about the effects of cultural production and consumption patterns on the cultural similarity of countries, I can evaluate the broader claim of modernization theory that economic development leads to cultural similarity. I expect this relationship to persist alongside the effects of cross-national interactions.

I will evaluate the ability of the above mechanisms to explain cultural similarity and cultural change using dyadic multivariate models. In addition to controlling for a variety of country characteristics, the models will include measures of religious traditions, imperial history, geographical regions, and linguistic heritage, which will allow me to test the predictive power of the criteria that underlie the cultural zone schema proposed by Inglehart and Baker (2000).

Data

The data used in this project were compiled from a number of distinct sources. The main dependent variable, dyadic cultural similarity, comes from three waves of World Values Survey (WVS) (Inglehart and Carballo, 1997), as does the measure of religiosity. The trade flow data were obtained from version 2.01 of the Correlates of War (COW) International Trade data set (Barbieri et al., 2008). The military alliance data came from the Alliance Treaty Obligations and Provisions project (Leeds et al., 2002). Data on inter-governmental organization (IGO) memberships were compiled by Pevenhouse and Nordstrom (2003), while a more detailed breakdown of IGO types was obtained from Paul Ingram (Ingram et al., 2005). The international phone call data were collected by Miguel Centeno's Mapping Globalization (2007) project at Princeton University. Military conflict data come from the Militarized Interstate Disputes dataset (Ghosn et al., 2004). Country groupings into former empires, religious traditions, cultural zones, and civilizations were based on Miguel Centeno's empire classification data, the CIA *World Factbook* (2007), and Inglehart and Baker's (2000) and Huntington's (1993) categorization schemes. Regional groupings reflect countries' locations on geographic continents (or subcontinental regions, in the case of East, South, and Western Asia), while language categories are based on historical membership in commonly recognized linguistic families. Finally, data on levels of democracy and regime durability come from the Polity IV project (Marshall and Jaggers, 2005), while trade dependency data come from the World Bank's World Development Indicators (World Bank, 2006).

The choice of countries and time points in the study was determined by the availability of data from the WVS, the source of the dependent variable. Given my interest in cultural change, I restrict my sample to the 19 countries that appear in the second, third, and fourth waves of the WVS (1990, 1995, and 2000) and for which data on all the other variables in the analysis are available. They include Argentina, Bulgaria, Chile, China, Finland, Germany, Hungary, India, Japan, Mexico, Nigeria, Poland, Republic of Korea, Romania, South Africa, Spain, Sweden, Turkey, and United States.

Measures

Dependent variable

To generate results comparable with those of Inglehart and Baker (2000), I use factor analysis to reduce 10 indicators from the WVS to two latent dimensions of cultural differentiation. According to Inglehart and Baker's interpretation, these emergent dimensions capture the continuum between four poles of national values: traditional versus secular-rational and survival versus self-expression.

Table 1. Factor analysis results

Dimension and item	Factor loadings		Uniqueness
Axis A (Traditional vs Secular-Rational)			
Importance of God	0.935	–	0.112
Abortion is never justifiable	0.891	–	0.187
National pride	0.765	–	0.412
Obedience and faith in child-rearing	0.764	–	0.397
Respect for authority	0.672	–	0.512
Axis B (Survival vs Self-Expression)			
Priority of economic and physical security	–	0.827	0.313
Unhappiness	–	0.722	0.450
Refusal to sign petition	–	0.718	0.372
Homophobia	–	0.687	0.366
Mistrust	0.405	0.390	0.684

The factor analysis is based on mean national scores measuring respondents' agreement with the following statements:

- God is very important in respondent's life.
- It is more important for a child to learn obedience and religious faith than independence and determination.
- Abortion is never justifiable.
- Respondent has strong sense of national pride.
- Respondent favors more respect for authority.
- Respondent gives priority to economic and physical security over self-expression and quality-of-life.
- Respondent describes self as not very happy.
- Respondent has not signed and would not sign a petition.
- Homosexuality is never justifiable.
- You have to be very careful about trusting people.

The above indicators were first dichotomized and averaged for each country-year and then subjected to a factor analysis with varimax rotation. The results are presented in Table 1. With the exception of the trust variable in the third wave of the survey, the 10 indicators load onto the same two dimensions as those observed by Inglehart and Baker. I employ the authors' labels for the two dimensions throughout this article for the sake of consistency. The reader should keep in mind that these are mere shorthand for the multiple measures that load onto each of the two factor-analytic dimensions.

The results of the factor analysis were used to predict values on the two dimensions for each country-year, which were then visualized on a scatterplot. The results are presented in Figure 1.[1] The first thing to notice is that there is considerable movement between the three waves of data. For instance, in 1990, China occupies the highest position on the traditional/secular-rational axis, but by 2000 its position becomes more moderate. In the same time period, Mexico moves slightly in the direction of self-expression and drops considerably on the traditional/secular-rational axis.

The relational approach used to construct the main dependent variable stresses the distance between pairs of countries rather than countries' absolute location in the factor analytic space. For
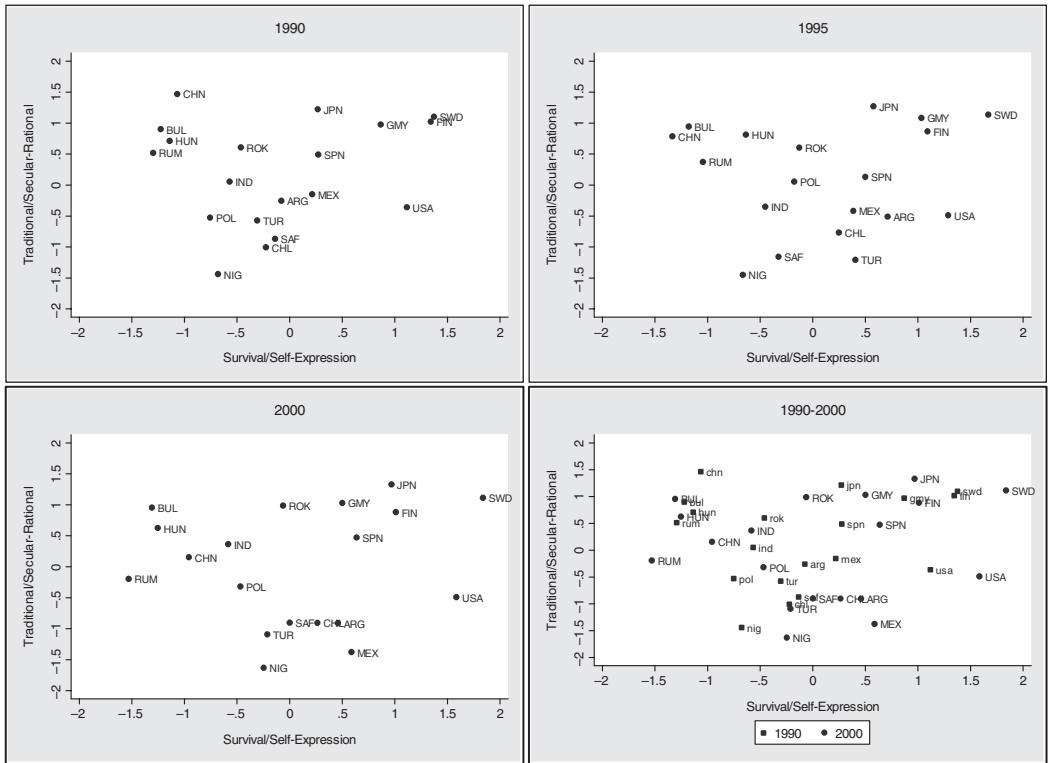
Figure 1. Country positions in factor analytic space
Country codes: ARG Argentina, BUL Bulgaria, CHL Chile, CHN China, FIN Finland, GMY Germany, HUN Hungary, IND India, JPN Japan, MEX Mexico, NIG Nigeria, POL Poland, ROK South Korea, RUM Romania, SAF South Africa, SPN Spain, SWD Sweden, TUR Turkey, USA United States.

example, China moved closer to India between 1990 and 2000 (i.e. it became culturally more similar to India), but maintained its distance from other countries, like Hungary. Other countries, like Sweden and Finland, moved away from one another in the same period. I hypothesize that this movement is caused by three primary factors: changes in the relative levels of economic development, changes in the relative levels of religiosity (which is correlated with but partly distinct from development), and changes in organizational and social-network interactions between the countries.

The dyadic dependent variable consists of the vector distances between all pairs of countries on the cultural maps generated from each of the three waves of data. The country-by-country distance matrices were converted into similarity matrices by subtracting each cell from the sum of the minimum and maximum values in each matrix.

Relational independent variables

The analysis includes five independent variables that measure institutional and interpersonal contact between nations: trade flows, military alliances, IGO co-memberships, international phone calls, and past military conflicts. Each of these variables is inherently relational, because every flow must have an origin and a destination, every treaty must have at least two signatories, every

organization must have at least two members, and every conflict must consist of at least two adversaries. These variables were constructed as follows.

Trade flows.   The trade flow data from the Correlates of War project (Barbieri et al., 2008) consist of summed bilateral imports and exports for every country dyad in 1990, 1995, and 2000.[2] The trade values were converted to 2001 US dollars, normalized to take into consideration countries' overall trade volume (trade within the dyad was divided by the smaller of the two countries' trade volumes), and log-transformed to correct for positive skew.

Military conflict.   The dyadic military conflict data were generated from Ghosn et al.'s (2004) Militarized Interstate Dispute data. The dataset includes detailed information on every international military conflict that occurred between 1816 and 2001. All cases where hostilities involved a display of force, use of force, or war were classified as conflicts for the purposes of the analysis. The final variable consists of a count of conflicts in the 25-year period preceding each wave of data collection for the dependent variable.

Military alliances, IGO co-memberships, and phone calls.   The military alliance, IGO co-membership, and phone call data were readily available in dyadic format, so no additional transformations of the data were necessary. I chose a time lag of five years for the alliance and IGO co-memberships after experimenting with a variety of lag structures.

Country grouping variables

To examine the influence of historical and geographic factors on cross-national cultural similarity, I generated measures of countries' common imperial past, religious traditions, geographic location by region, and linguistic heritage. The categorization schemes used in the analysis are listed in Table 2. For every country dyad, the measures have a value of one if both countries are members of the same country group and a value of zero if they are not.

The measure of imperial past groups together former imperial subjects with their former rulers under the assumption that, despite its asymmetry, the experience of foreign occupation can facilitate the diffusion of institutional models and cultural practices. In cases where a country has been incorporated into multiple empires over the course of its history (e.g. Bulgaria, Hungary, Finland, Poland, Romania, South Africa, and Spain), the variable indicates only the most recent imperial membership. The religious tradition measure, compiled from the CIA *World Factbook*, classifies countries based on their modal religious denominations. In the few cases where multiple denominations with similar proportions of adherents co-exist in a single country (e.g. Germany), the countries were coded as simultaneously belonging to multiple groups. The linguistic heritage variable groups countries whose modal language belongs to the same linguistic family. Finally, the region variable is based on a conventional coding of countries' geographic locations.[3]

Nodal attribute variables

The remaining variables in the analysis take the form of dyadic similarities between country attributes in the domains of politics, trade, and economic development. These include Gross National Income (GNI) per capita (in 2001 US dollars) and trade dependency (i.e. trade as percent of GDP), both from the World Development Indicator data base (World Bank, 2006), a democracy index and a political regime durability measure from the Polity IV data set (Marshall

Table 2. Country groupings

Country	Empire	Geographic region	Religion	Linguistic family	Inglehart's cultural zone	Huntington's civilization
Argentina	Spanish	South America	Catholic	Romance	Latin America	Latin America
Bulgaria	Soviet	Europe	Orthodox	Slavic	Orthodox/Ex-Communist	Orthodox
Chile	Spanish	South America	Catholic	Romance	Latin America	Latin America
China	Chinese	East Asia	Buddhist	Sino–Tibetan	Confucian/Ex-Communist	Sinic
Finland	Russian	Europe	Protestant	Finno-Ugric	Protestant Europe	Western
Germany	German	Europe	Catholic/Protestant	Germanic	Protestant Europe/Ex-Communist	Western
Hungary	Soviet	Europe	Catholic	Finno-Ugric	Catholic Europe/Ex-Communist	Western
India	British	South Asia	Hindu	Indo-Aryan	South Asia	Hindu
Japan	Japanese	East Asia	Buddhist	Japonic	Confucian	Japan
Mexico	Spanish	North America	Catholic	Romance	Latin America	Latin America
Nigeria	British	Africa	Muslim/Catholic/Protestant	Niger–Congo	Africa	Sub-Saharan
Poland	Soviet	Europe	Catholic	Slavic	Catholic Europe/Ex-Communist	Western
Romania	Soviet	Europe	Orthodox	Romance	Orthodox/Ex-Communist	Orthodox
South Africa	British	Africa	Protestant	Bantu	Africa	Sub-Saharan
South Korea	Japanese	East Asia	Buddhist/Protestant	Isolate	Confucian	Sinic
Spain	Spanish	Europe	Catholic	Romance	Catholic Europe	Western
Sweden	Swedish	Europe	Protestant	Germanic	Protestant Europe	Western
Turkey	Ottoman	Western Asia/Europe	Muslim	Turkic	South Asia	Lone state
United States	British	North America	Protestant/Catholic	Germanic	English-speaking	Western

and Jaggers, 2005), and a measure of religiosity derived from the World Values Survey data. The religiosity variable measures the percentage of people in each country who attend religious services at least once a week. All attribute variables were transformed into similarity matrices, which compare the relative values of a given attribute for every pair of countries in the sample (the specific metric used was the identity coefficient). Table 3 presents the descriptive statistics for all the variables.

Following the sizeable literature on the non-economic determinants of secularization, I have treated religiosity and economic development as two distinct processes. Researchers have demonstrated that the persistence of religious beliefs and practices depends on factors such as the existence of an official state religion, the degree of religious pluralism, regulation of religion by the state, and the historical presence of a Communist regime (Barro and McCleary, 2003; Finke and Stark, 1993). The distinction receives support in the present study, with religiosity and logged GNI per capita having independent significant effects on cultural similarity. The variables are not found to be collinear in any of the models.

The mechanisms that underlie the effects of religiosity and economic development are likely to be distinct. Religiosity should impact countries' position on both scales of cultural differentiation in a direct manner, with lower religious attendance resulting in lower perceived importance of God, more conservative views on abortion and homosexuality, higher value placed on obedience in childrearing, greater respect for authority, and higher levels of national pride.[12] In contrast, the effects of GNI may be both direct and indirect. Greater prosperity is likely to lead directly to a lesser priority placed on economic and physical security and possibly on lower levels of mistrust toward others. Less direct mechanisms may include greater emphasis placed on consumption, which generates demand for luxury goods that come bundled with particular lifestyle preferences (for instance, the importance placed on self-expression and personal happiness); the rationalizing effects of education, which is highly correlated with national income; the greater need for a large and highly skilled work force, which erodes traditional gender roles and family structures; or the greater exposure to demographic diversity in increasingly urbanized societies.

Methods

To model the predictors of cultural similarity I employ dyadic ordinary least-squares (OLS) and fixed-effects regression. OLS is used in the cross-sectional models for each of the three waves of data while the fixed-effects regression pools together the data in order to identify the determinants of cultural change over time. Both methods are modified to account for the fact that dyadic network data fail to meet the basic regression assumption of the independence of observations, since the same countries are repeatedly featured in multiple observations (e.g. China and Spain, China and the US, the US and Spain, and so on). Standard regression applied to this type of dyadic data would generate unbiased coefficient estimates, but it would underestimate their standard errors.

An accepted method for dealing with autocorrelation in dyadic data is the multiple-regression quadratic assignment procedure (QAP) developed by Krackhardt (1988), which works similarly to a common bootstrapping algorithm. QAP permutes the rows and columns of the dependent variable matrix (in my case, there are 19 rows and 19 columns, corresponding to the 19 countries in the data), preserving the relationships between the nodes but scrambling their order, and regresses the permuted matrix on the (unpermuted) independent variables. Because the dependent variable matrix is scrambled, the regression coefficients reflect the null hypothesis, that is, a lack of relationship between the independent variables and the outcome. The procedure is repeated a predetermined number of times (I use 5000 iterations) to generate an empirical sampling distribution of regression

Table 3. Descriptive statistics (units of analysis are country dyads)

Variable	1990					1995					2000				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Cultural similarity[a]	171	1.816	0.714	0.086	3.267	171	2.124	0.712	0.223	3.484	171	2.076	0.777	0.194	3.613
GNI per capita[b]	171	0.640	0.296	0.056	1	171	0.654	0.287	0.052	1	171	0.660	0.281	0.048	1
Religiosity[b]	153	0.545	0.336	0.012	1	153	0.598	0.299	0.061	1	171	0.594	0.309	0.048	1
Empire[c]	171	0.111	0.315	0	1	171	0.111	0.315	0	1	171	0.111	0.315	0	1
Religious tradition[c]	171	0.345	0.477	0	1	171	0.345	0.477	0	1	171	0.345	0.477	0	1
Geographic region[c]	171	0.199	0.400	0	1	171	0.199	0.400	0	1	171	0.199	0.400	0	1
Linguistic family[c]	171	0.105	0.308	0	1	171	0.105	0.308	0	1	171	0.105	0.308	0	1
Military conflicts[c]	171	0.076	0.520	0	5	171	0.041	0.294	0	3	171	0.041	0.294	0	3
Military alliances[c]	171	0.117	0.322	0	1	171	0.135	0.342	0	1	171	0.135	0.342	0	1
IGO co-memberships[d]	171	37.588	9.879	19	72	171	44.196	10.981	20.5	86.333	171	48.341	10.474	32.333	91.5
Democracy index[b]	171	0.489	0.738	-1	1	171	0.575	0.761	-1	1	171	0.758	0.596	-1	1
Regime durability[b]	171	0.290	0.338	0	1	171	0.481	0.348	0	1	171	0.522	0.319	0.011	1
Trade flow (ln)[e]	171	0.688	1.619	0	16.03	152	0.861	1.891	0.001	14.991	153	1.012	2.256	0.004	15.593
Trade dependence[b]	171	0.830	0.177	0.375	1	171	0.811	0.191	0.267	1	171	0.821	0.189	0.298	1
Phone calls[d]	149	0.064	0.127	0.001	0.650	—	—	—	—	—	—	—	—	—	—

[a] Cutural similarity is measured as the Euclidian distance between point coordinates of countries in the two-dimensional space produced by factor analysis, which is then converted to a measure of similarity by subtracting from the sum of largest and smallest distance in each wave of the data.
[b] GNI per capita, religiosity, democracy, regime durability, and trade dependence are measures of dyadic similarity on each of these nodal attributes, calculated using the identity coefficient bounded by 0 and 1.
[c] Empire, religious tradition, linguistic family, and military alliances are binary measures of co-membership in the groups constituted by each of these indicators. Military conflict is a binary measure indicating the presence of a conflict in the 25 years prior to the year of WVS data collection. The alliance variable is lagged by five years.
[d] IGO co-memberships and phone calls are unstandardized dyadic count measures. The IGO variable is lagged by five years.
[e] Trade flows are measured by summing bilateral imports and exports and dividing them by the lesser of the total trade figures for the two countries in the dyad. The measure is logged to minimize skewness.
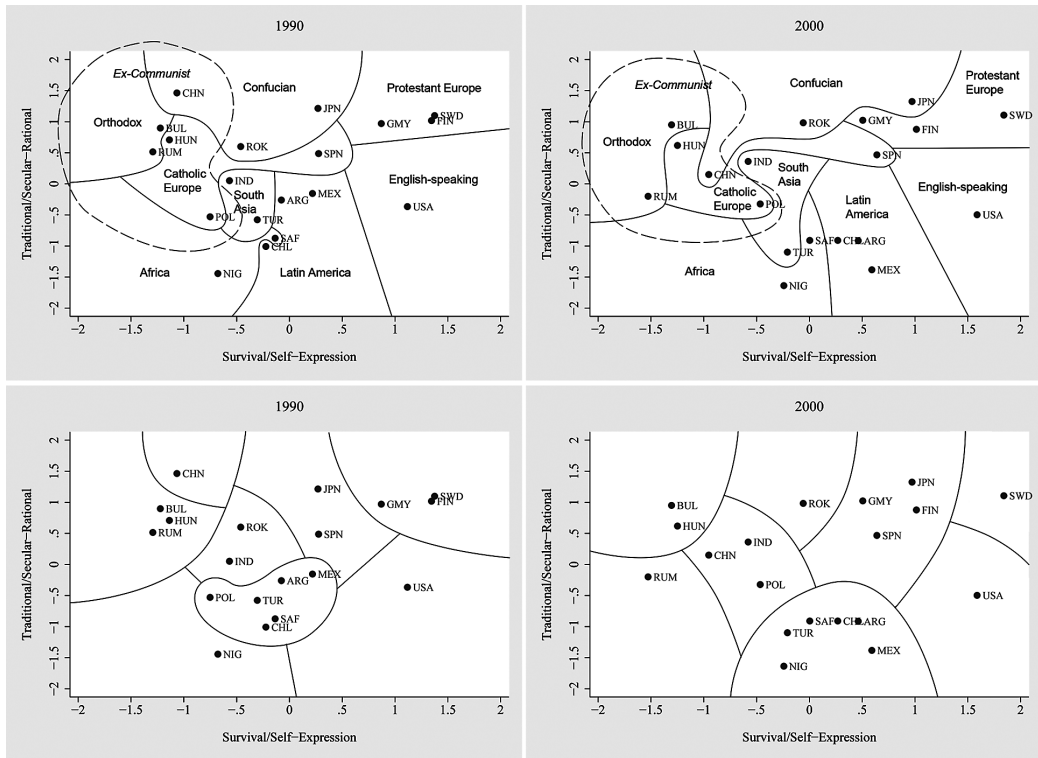
Figure 2. Cultural maps with superimposed cultural zones (above) and inductive clusters (below), 1990 and 2000
Country codes: ARG Argentina, BUL Bulgaria, CHL Chile, CHN China, FIN Finland, GMY Germany, HUN Hungary, IND India, JPN Japan, MEX Mexico, NIG Nigeria, POL Poland, ROK South Korea, RUM Romania, SAF South Africa, SPN Spain, SWD Sweden, TUR Turkey, USA United States

coefficients. The coefficients from the original unpermuted matrices are then compared with this sampling distribution; if an observed coefficient falls into an extreme high or low percentile of the bootstrapped distribution, we can conclude that it was not produced by chance. I employ an MRQAP subroutine developed for the Stata statistical package by William Simpson (2001).

Cultural zones

Inglehart and Baker's (2000) theory of cultural change is predicated on the argument that global convergence around postmaterialist attitudes is driven by economic development, but that the process is uneven because national cultures are constrained by their cultural heritage. This path dependence is captured by the authors' notion of a cultural zone – a country is supposed to be more culturally similar to others within the same zone and less similar to those belonging to other zones. The logic is similar to Huntington's clash of civilizations thesis, which views national cultures as deeply rooted in primordial civilizational traditions that have remained largely unchanged for centuries (presumably at least since the axial age; Eisenstadt, 1982).[4] Inglehart and Baker's cultural zones mirror Huntington's civilizational categories, with a few exceptions: the West is separated

into Catholic Europe, Protestant Europe, and the English-speaking world, and Japan is grouped with Sinic countries into a common Confucian group. For purposes of illustration, I superimposed Inglehart and Baker's cultural zones on the factor analysis results for the 1990 and 2000 waves of the WVS, following the authors' own visualization approach. The results are presented in the top two graphs of Figure 2.

The major problem with the cultural zone construct is its reliance on a set of inconsistent grouping criteria. Some of the cultural zones are religious, some are philosophical, while others are geographic, and others yet linguistic. The resulting categories tell us little about the historical factors that create the ostensible conditions of cultural path dependence, which in turn makes it impossible to evaluate the validity of the path dependence argument or to theorize about the durability of the effects posited by it. In effect, the cultural-zone approach results in a selection of cases on the dependent variable: it enables Inglehart and Baker to draw boundaries around countries located in similar regions of the cultural map (based on the 1990 wave), and to justify those boundaries based on the argument that the countries within them share some historical features, even though the features in question vary from one category to another.[5]

The trouble is that one can imagine making a similar argument based on different criteria of membership that also result in a reasonable fit around the points on the cultural map. Indeed, the authors themselves hint at this when they draw the boundaries of the former Communist bloc over three of their cultural zones: Orthodox (Bulgaria and Romania), Confucian (China), and Catholic Europe (Poland). Other possible examples include geographic location in North America (which would group Mexico with the US) or Eastern Europe (which would bring together Bulgaria, Hungary, Romania, and Poland, but not China), or alliance during the Second World War (which would group Germany, Japan, Hungary, Romania, and Bulgaria).

On the other hand, if we chose to classify the countries based on a systematic application of specific criteria, such as language, region, religion, or empire, across all the cases, we would have trouble drawing neat boundaries on the cultural map. For instance, common linguistic family would group together Finland and Hungary, which are located on opposing poles of the horizontal axis, while region would bring together Sweden with Poland, despite their considerable cultural distance from one another. What these examples illustrate is that it is possible to pick idiosyncratic country attributes to produce groupings that will fit the points on the cultural map, but it is very difficult to do the same with a single attribute applied across all the cases.

An argument could be made that different combinations of multiple grouping criteria produce similar results for different cases. This possibility could be tested using a combinatorial method such as Ragin's (1987) qualitative case analysis. However, the plausability of this explanation is challenged by the fact that Inglehart and Baker's own categories do not fit the data nearly as well as the authors claim they do. This is illustrated in the top two graphs in Figure 2. In 1990, the boundaries of Inglehart and Baker's cultural zones are relatively easy to draw, although squeezing Spain into Catholic Europe and South Africa into Africa (or conversely, Chile into Latin America) is tricky. However, by 2000 the boundaries become far more difficult to delineate. The movement of China in the direction of traditional values makes it challenging to group it with other Confucian countries due to the inconvenient location of Catholic Europe and South Asia. South Asia and Catholic Europe themselves present some difficulties, because of the positions of China and Poland. In fact, the middle of the figure looks more like a vortex than a center of a pie, with China and India begging to be included in Catholic Europe and Poland in South Asia. The situation would be even more difficult if more countries were included in the analysis (in their article, Inglehart and Baker plot the positions of 65 countries and, predictably, their figures look considerably messier than those presented here).

The difficulty of superimposing the cultural zone boundaries on the scatterplot representing the 2000 wave of data challenges the validity of the civilizational path-dependency argument in another fundamental way. If civilizations, and the cultural zones derived from them, date back to the axial age (roughly 22 centuries ago) and, as the argument goes, their membership has not changed much since, how is it possible that the cultural zone boundaries become so much more difficult to delineate over a mere 10-year period? Could 2000 years of history erode within a decade? It would be difficult to imagine the kind of social processes that could rapidly undo as powerful a phenomenon as a primordial civilization – globalization, as influential as it may be, is unlikely to fit the bill. More likely, the cultural zones are analytical artifacts that appear to fit the data (though not very well) at a single point in time.

If we want to capture variation in the cultural similarity variable by classifying it into a set of categories, a more systematic method for doing so is to subject the dependent variable to an inductive clustering analysis. Of course, the results of such an analysis cannot be used to explain cultural variation, because the clusters are themselves based on the variable in need of explanation. What such categorization can allow, however, is to determine whether countries group in similar ways over the successive waves of the data and whether the inductive clusters resemble Inglehart and Baker's cultural zones.

The two bottom graphs in Figure 2 present the results of a hierarchical cluster analysis, which groups the countries based on their cultural similarity. The algorithm first combines the dyads with the greatest similarity scores and then it combines the resulting clusters one step at a time, based on the average similarities of their members. The procedure is repeated in successive steps until all countries are part of a single cluster. The result is a nested tree structure with each level representing increasingly greater (dis)similarities between the countries within the clusters. I chose to depict an eight-cluster solution for both of the waves of the data in order to compare the inductive cluster membership with the eight cultural zones constructed by Inglehart and Baker.

The first thing to notice in the diagrams is that cluster membership is far from stable over the 10-year period between 1990 and 2000. The only cluster whose membership does not change is the one consisting solely of the United States; all others lose or gain one member (e.g. the cluster containing Turkey and South Africa loses Poland but gains Nigeria) or become completely reconfigured (e.g. South Korea and India split, with Korea becoming an isolate and India joining China and Poland). Clearly, a stable set of primordial cultural zones does not describe the data across the two time points.

Second, with a few exceptions, the inductive clusters do not correspond to the cultural zones. In 1990, those exceptions include the USA isolate, the Sweden-Finland-Germany cluster, and the Nigeria isolate. In 2000, only the USA isolate remains consistent in both classification schemes. Even if we consider partial overlap between the categories, the cultural zones do not fare well. For instance, in 1990, the three members of the Confucian zone are split into separate inductive clusters, as are the three members of the Catholic Europe zone and the two members of the South Asia zone. Conversely, the kidney-shaped cluster located in the bottom-center of the 1990 inductive graph groups together members of the South Asia, Catholic Europe, Latin America, and Africa cultural zones. The discrepancies are even greater in 2000. In sum, it is safe to conclude that the comparison of the cultural zone and inductive cluster models reveal a general lack of support for the cultural zone groupings in the data.

Because the validity of the cultural zones appears theoretically and empirically suspect, I will not include them in subsequent analyses. However, I will assess the ability of the four criteria of cultural zone assignment, that is, empire, language, religion, and region, to systematically explain the variance in countries' relative cultural similarity.

Predictors of cultural similarity

I test the predictors of dyadic cultural similarity in two separate analyses. First, I examine the effects of national attributes, cultural and political heritage, and political, economic, and civil society relations on countries' cultural similarities for each of the three waves of data. These cross-sectional models consider both time-variant and time-invariant factors associated with cultural similarity, but they do not analyze them over time. Second, I use fixed-effects models to examine the dynamic impact of time-varying variables on the cultural convergence and divergence between countries. Given that variables which do not change over the 10 years of the study, such as geographic region and religious heritage, cannot influence change in cultural similarity, they are excluded from the fixed-effects analysis.

Cross-sectional analysis

The results of the cross-sectional OLS regression predicting cultural similarity are presented in Table 4. The models include country groupings, such as co-membership in empires and religious traditions, relational variables, such as trade and alliances, and country-attribute similarity variables, such as GNI per capita and democracy.[6] For each wave of data, the variables are first introduced in successive models and then combined in a full model in order to compare their net effects. Data on international phone calls are only available for 1990. The table includes unstandardized coefficients, standard errors in parentheses, and beta weights (i.e. standardized coefficients) in italics. The beta weights provide a more meaningful comparison of the magnitudes of individual effects than the unstandardized coefficients, given the non-intuitive metrics of most of the variables.

The two measures in the first model, dyadic similarity of GNI per capita and religiosity, capture the two most apparent factors likely to affect the two dimensions of cultural similarity. If the first factor-analytic dimension (the x-axis in Figures 1 and 2) measures people's tendency to espouse attitudes characteristic of a survivalist disposition rather than one focused on personal expression, we should not be surprised that countries that are more economically developed score higher on this dimension.[7] Similarly, given that the second dimension measures the relative importance of traditional versus secular principles, it makes sense that countries' locations on this dimension are related to their average levels of religiosity.

Interestingly, however, past analyses of postmaterialism have tended to include measures of economic development while omitting measures of religiosity, because of an assumption that religiosity (at least behavioral measures thereof) is a mediating variable that itself stems from economic development. If this were in fact true, we would expect to observe a high degree of collinearity between GNI per capita and religiosity. Yet, this is not the case in Model 1: the centered variance inflation factor (VIF) for both variables is 1.09, well below the conventional threshold of 10 (Fox and Monnette, 1992). The GNI and religiosity measures have reasonably low standard errors and are both highly significant in model 1a and in all subsequent models in the analysis. Not surprisingly, the coefficients for these variables are quite high. An increase of one standard deviation in the similarity of countries' GNI per capita produces a change in countries' cultural similarity that ranges from 0.309 standard deviations in model 2a to 0.421 standard deviations in model 1f. The effects of a one-standard-deviation increase in the similarity of countries' average religiosity on cultural similarity range from 0.317 in model 3a to 0.508 in model 2a. The magnitude of these effects is largely unchanged once a variety of additional variables are introduced in the full models.

The lack of collinearity between GDP per capita and religiosity is consistent with the fact that economic development seemed to align more closely with the survival/expression dimension than

Table 4. Cross-sectional regression results (dependent variable: cross-national cultural similarity)[a]

Year (all variables)	1990					
Model	1A	1B	1C	1D	1E	1F
Development and religiosity						
GNI per capita	0.822**					1.014**
	(0.259)					(0.300)
	0.341					*0.421*
Religiosity	0.762**					0.773**
	(0.231)					(0.246)
	0.358					*0.364*
Country groupings						
Empire		0.608**				0.240
		(0.207)				(0.262)
		0.852				*0.336*
Religion		0.054				−0.126
		(0.160)				(0.172)
		0.075				*−0.176*
Geographic region		−0.054				−0.113
		(0.184)				(0.232)
		−0.076				*−0.159*
Language		−0.070				−0.229
		(0.211)				(0.238)
		−0.098				*−0.321*
Politics						
Military conflict (t-25)			0.014			−0.036
			(0.111)			(0.116)
			0.010			*−0.026*
Military alliances (t-5)			0.330*			0.060
			(0.161)			(0.186)
			0.191			*0.035*
IGO co-memberships (t-5)			0.003			0.009
			(0.010)			(0.013)
			0.044			*0.125*
Democracy index			0.143			−0.185
			(0.124)			(0.158)
			0.148			*−0.191*
Regime durability			0.239			0.054
			(0.201)			(0.247)
			0.113			*0.025*
Trade						
Trade flow (log)				0.099*		0.138*
				(0.045)		(0.073)
				0.215		*0.299*
Trade dependency				−0.388		−0.520
				(0.414)		(0.458)
				−0.096		*−0.129*
Social networks						
Phone calls					1.307**	−0.057
					(0.416)	(0.639)
					0.232	*−0.010*
Intercept	0.876	1.748	1.512	2.286†	1.697	1.081
	(0.192)	(0.059)	(0.341)	(0.353)	(0.038)	(0.655)
N	153	171	171	171	149	134
Adjusted R^2	0.311	0.046	0.052	0.046	0.049	0.424

Table 4. *(Continued)*

Year (all variables)	1995				
Model	2A	2B	2C	2D	2E
Development and religiosity					
GNI per capita	0.766**				0.824*
	(0.288)				(0.347)
	0.309				*0.332*
Religiosity	1.209***				1.075***
	(0.230)				(0.243)
	0.508				*0.452*
Country groupings					
Empire		0.716**			0.472*
		(0.204)			(0.225)
		1.005			*0.662*
Religion		0.105			0.059
		(0.156)			(0.175)
		0.147			*0.082*
Geographic region		0.101			−0.178
		(0.183)			(0.228)
		0.142			*−0.250*
Language		−0.076			−0.248
		(0.209)			(0.223)
		−0.107			*−0.349*
Politics					
Military conflict (t-25)			0.160		−0.013
			(0.194)		(0.263)
			0.066		*−0.005*
Military alliances (t-5)			0.340		−0.016
			(0.276)		(0.287)
			0.127		*−0.006*
IGO co-memberships (t-5)			0.006		0.008
			(0.008)		(0.011)
			0.097		*0.122*
Democracy index			0.180†		−0.024
			(0.119)		(0.200)
			0.192		*−0.026*
Regime durability			0.058		−0.023
			(0.215)		(0.240)
			0.028		*−0.011*
Trade					
Trade flow (log)				0.093*	0.065
				(0.053)	(0.071)
				0.181	*0.127*
Trade dependency				−0.036	0.044
				(0.394)	(0.397)
				−0.010	*0.012*
Social networks					
Phone calls					
Intercept	0.920	1.996	1.682	2.275	0.690
	(0.220)	(0.058)	(0.358)	(0.329)	(0.651)
N	153	171	171	152	135
Adjusted R^2	0.429	0.099	0.065	0.020	0.477

(Continued)

Table 4. *(Continued)*

Year (all variables)	2000				
Model	3A	3B	3C	3D	3E
Development and religiosity					
GNI per capita	1.028***				0.906**
	(0.268)				(0.298)
	0.372				*0.328*
Religiosity	0.796**				0.892**
	(0.221)				(0.240)
	0.317				*0.355*
Country groupings					
Empire		0.571**			0.535*
		(0.220)			(0.240)
		0.735			*0.688*
Religion		0.119			0.182
		(0.160)			(0.167)
		0.154			*0.234*
Geographic region		0.010			−0.256
		(0.188)			(0.229)
		0.013			*−0.330*
Language		−0.163			−0.442
		(0.223)			(0.245)
		−0.210			*−0.568*
Politics					
Military conflict (t-25)			−0.052		0.025
			(0.211)		(0.222)
			−0.020		*0.009*
Military alliances (t-5)			0.441†		0.062
			(0.293)		(0.294)
			0.151		*0.021*
IGO co-memberships (t-5)			0.010		0.022*
			(0.009)		(0.012)
			0.132		*0.290*
Democracy index			−0.143		−0.378
			(0.157)		(0.173)
			−0.109		*−0.290*
Regime durability			0.748**		0.184
			(0.231)		(0.247)
			0.307		*0.075*
Trade					
Trade flow (log)				0.123*	−0.038
				(0.052)	(0.068)
				0.235	*−0.073*
Trade dependency				0.000	0.009
				(0.407)	(0.417)
				0.000	*0.002*
Social networks					
Phone calls					
Intercept	0.925	1.987	1.290	2.183	−0.021
	(0.215)	(0.060)	(0.422)	(0.342)	(0.679)
N	171	171	171	153	153
Adjusted R^2	0.262	0.035	0.119	0.043	0.350

[a] *** $p<0.001$, ** $p<0.01$, * $p<0.05$, † $p<0.1$, one-tailed test; Coefficients followed by standard errors in parentheses and beta weights in italics.
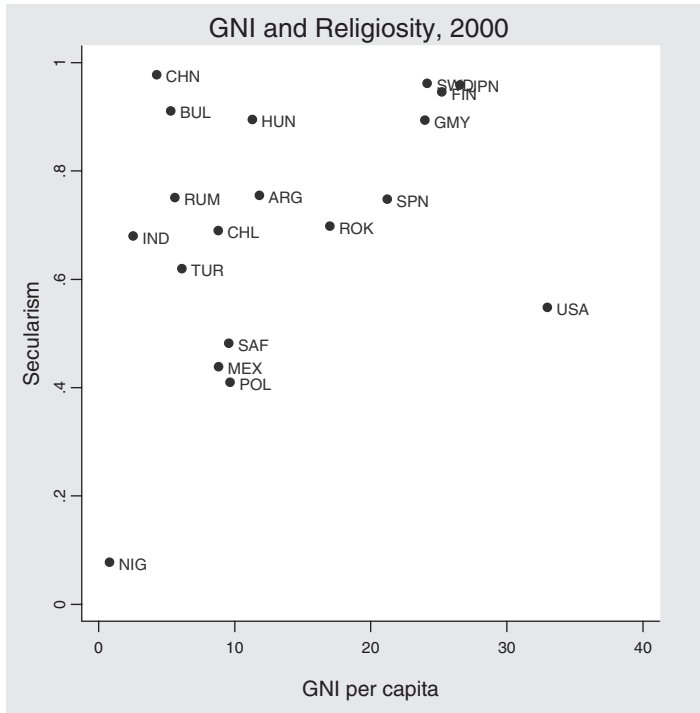
Figure 3. Relationship between GNI and religiosity, 2000

the traditional/secular dimension in Inglehart and Baker's (2000) study. It is also in line with findings from the secularization literature, which suggest that development is negatively correlated with only some measures of religiosity and only in some countries, most notably in Western Europe. If the secularization thesis does not hold in the United States, Eastern Europe, and much of the developing world, we should expect most countries from these regions to occupy an off-diagonal space in a scatterplot of secularism and GNI. This is precisely the case in Figure 3, which maps these variables for the 2000 data (secularism is calculated here as the proportion of the population that attends religious services less frequently than once a week). In fact, the distribution of countries on this scatterplot bears some resemblance to their arrangement on the cultural map in Figure 1, though the discrepancies between the two graphs suggests that variables other than GNI and religiosity must contribute to the cross-national cultural differences. The adjusted R^2 for models 1a, 2a, and 3a in Table 4 range from 0.262 to 0.429, indicating levels of unexplained variance between 73.8 percent and 57.1 percent. I examine the effects of other possible explanatory variables in subsequent models. Since explaining religiosity and development in their own right is not the objective of this article, I treat both of those variables as controls in the remaining analyses.

Models 1b, 2b, and 3b examine the effect of countries' historical commonalities on their cultural similarity. These models systematically test the criteria on which Inglehart and Baker's and Huntington's civilizational classifications are based. If primordial differences between national cultures continue to shape countries' cultural trajectories through a path-dependent process, we would expect co-membership in religious traditions and linguistic families and co-presence in geographic regions to have large effects on cultural similarity. Yet none of those three co-membership

variables are statistically significant in any of the models. The coefficients for linguistic traditions are negative in all the models, while those for religion and region switch signs across models.

These non-significant results may appear counter-intuitive at first, but they are reasonable given the cross-cutting nature of the cultural heritage categories. It is possible that shared religious heritage does produce some degree of cultural similarity through common ecclesial institutions or shared doctrinal principles. However, because religiously similar countries are scattered throughout the world rather than clustered in particular regions, they inevitably engage in interactions with neighbors who do not share their religious tradition and this, in turn, is likely to offset the average cultural effects of religious similarity. For instance, just because Poland and Argentina are both predominantly Catholic countries does not imply that Poland will be more similar to Argentina than it is to Russia, its geographic neighbor, even though Russia is predominantly Orthodox.

Conversely, regional co-presence does not in itself imply similarity. Countries that are geographically proximate may differ in terms of their religious, linguistic, and ethnic heritage, as well as their institutional histories (e.g. the United States and Mexico). The same argument can be made for heterogeneity within shared linguistic groups. Given their cross-cutting distribution, it is not all that surprising that region, religion, and language fail to predict cultural similarity. Some of the countries grouped by each of these variables are likely to be culturally similar while others are likely to be culturally distinct. If we want to understand the main mechanisms that drive cultural similarity, we must look to other possible predictors.

One such predictor is common imperial history, the one country grouping variable that is significant in all but one of the models in Table 4. Former colonies and their former colonizers seem to be more culturally similar to one another than countries that are not connected by past colonial ties; the effect ranges from 0.735 to 1.005 standard deviations in the reduced models and from 0.336 to 0.668 standard deviations in the full models. This finding leads to rather different conclusions about path dependence than those reached by Inglehart and Baker (2000). It appears that cultural similarity stems not from common roots in primordial civilizations, but rather from the institutional legacies of colonial rule, which translate into cultural attitudes.

The mechanism driving this translation process is consistent with that posited for cross-national contact: shared political, economic, and legal institutions produce similar cognitive models and moral orientations by classifying, describing, and defining social reality in a similar manner. In the case of cross-national contact, similar institutions are a result of exchange relations (of goods, capital, information, and people) that encourage imitation, whereas in the case of colonialism the relations are primarily coercive, with colonial powers imposing elaborate and lasting legal institutions on the territories under their control, including constitutions, legal codes and precedents, and bureaucratic practices (see DiMaggio and Powell, 1983). The coercive institutionalization process associated with colonialism has had lasting consequences for democratic stability (Olsson, 2009), economic development (Mahoney, 2003), and the law (Hussain, 2003), and it is likely that these institutional legacies have also affected the realm of everyday culture.

In addition to having similar institutional origins, countries with a shared imperial history may be more likely to maintain close relations for decades (even centuries) after formal imperial ties have been severed. Some of those relations may not be captured by the trade and intergovernmental organization variables in the models. This is certainly likely among former members of the Spanish and French colonial empires, countries of the British Commonwealth, and to a lesser degree, former Soviet republics and satellites. These countries regularly engage in academic exchanges, athletic competitions, art contests, and a variety of other cultural programs. Although these interactions are typically coordinated through IGOs, such as the Commonwealth of Nations, the Organization of Ibero-American States, and Francophonie, they cannot be adequately measured by a simple count of shared IGO ties.

It is important to note that the significant effects of empire differ considerably from the effects of primordial cultural zones posited by Inglehart and Baker. The cultural zones group together some former colonial subjects while splitting others into distinct geographic, linguistic, religious, and philosophical camps based on criteria shown in my models not to have independent significant effects on cultural similarity.[8] To the extent that the cultural zone scheme overlaps partly with the empire variable, it explains some variance in postmaterialist values, as it did in Inglehart and Baker's (2000) article. However, the conflation of empire with other non-significant country characteristics makes the cultural zone measure statistically noisy and, more importantly, leads to erroneous conclusions about the continued importance of primordial cultural differences between countries.

Models 1c, 2c, and 3c in Table 4 regress cultural similarity on cross-national political relations and the similarity of countries' political attributes. Of these, only military alliances reach significance in more than one model. Countries that have signed formal alliance treaties appear to be culturally more similar to one another, with the effect ranging from 0.127 to 0.191 standard deviations of the dependent variables (although the coefficient for the 1995 wave fails to reach significance). However, once other variables are added to the models, the alliance coefficients cease to be significant, which suggests that they largely mediate the effects of economic development, religiosity, and empire (as well as trade, which I discuss below).

A history of past military conflicts does not have significant effects in any of the models and the signs of its coefficients are unstable. It is possible that conflicts produce countervailing effects, because they lead to contact between countries (which should increase cultural similarity) but also generate animosities between them (which may decrease cultural similarity). Also, certain types of conflicts, such as prolonged occupations, may lead to a greater level of institutional and cultural exchange, while others, like brief clashes in remote regions, are unlikely to greatly impact the cultures of the adversaries. Finally, because there were very few observable conflicts among the countries in the sample over the 25 years prior to each wave of the data, the lack of consistent and significant effects may be a result of the low variance of the conflict variable.

The third measure of cross-national contact, IGO co-membership, is only significant in the full model for the 2000 wave of the data. However, its coefficients are positive in all the models and range in magnitude from 0.044 to 0.290 standard deviations of the dependent variable. This provides some preliminary evidence for a small effect of contact through IGOs on cultural similarity, which would be consistent with the world polity institutionalism thesis. Indeed, the magnitude of the significant coefficient for IGO co-membership in model 3e rivals those of economic development and religiosity. However, one should be careful in interpreting the coefficients in the other models given their lack of significance.

Of the two political attributes, only regime durability is significant and only in the reduced model for the 2000 wave. Its coefficients are weakly positive in four of the other five models, which suggests the possibility that countries with a longer tradition of democratic rule are more similar to one another culturally. However, as was the case with alliances, these effects seem to be largely accounted for by the other variables included in the full models. Similarity in the degree of democratization does not have significant effects on culture and the valence of its coefficients is not consistent across models. This may be largely due to the fact that all of the countries in the sample are democratic, though to differing degrees. A more diverse sample of countries that included autocratic states could produce different results.

The next set of models examines the effects of trade variables on cultural similarity. Similar levels of dependence on trade, measured as the percentage of a country's GDP generated through

trade, are not significant in any of the models and the corresponding coefficients switch signs between models. It appears that being exposed to economic globalization is not in itself a driver of cultural similarity. However, the effects of bilateral trade are large and significant in most of the models. The standardized coefficients range from 0.127 to 0.299, with the magnitude of the coefficient in model 1f rivaling that of religiosity. Cross-national contact through trade appears to be an important predictor of cultural similarity.

Interestingly, however, the effect of trade declines over time once other variables are controlled for in the full models. The coefficient is large and significant in model 1d, weaker and non-significant in model 2d, and negative and non-significant in model 3d. This suggests that the effects of trade on culture have wanted over time and have been replaced by those of other causal predictors. In particular, the variable that may mask the effects of trade in model 3d is IGO membership, since this is the only model in which IGO ties are significant and trade has a negative, though non-significant, effect. To verify whether this is the case, I reran model 3d without the IGO variable. As expected, the trade variable became positive, with a coefficient of 0.036 (with a corresponding beta weight of 0.069).[9] It appears that over the 15 years between the first and third wave of the data, countries' cultural similarity was increasingly produced by institutional (and personal) interactions facilitated through IGO ties and decreasingly through trade relations.

One possible cause of the disappearance of the trade-flow effect in the mid-1990s and early 2000s is the growing importance of multinational corporations during that time period (Reich, 1991). When a manufacturing firm opens a plant in a foreign country, its economic activities may not be captured by traditional import and export data. More generally, as the nation-state gradually declines in importance as the basic unit of analysis for economic activity, trade data may be decreasingly capable of detecting cross-national economic exchanges.

The final variable in the analysis is the volume of phone calls between countries. Since phone call data were only available for 1990, the variable is only included in models 1e and 1f. The coefficient for phone calls is positive and significant in model 1e, which supports the hypothesis that cross-national contact through social networks is associated with cultural similarity. However, the effect ceases to be significant and its sign switches once other variables are introduced in model 1f, which indicates that phone calls have no independent effect on shared culture net of countries' similarities in levels of development, religiosity, trade, and imperial past. In particular, the correlation between international phone calls and empire is very high ($r = 0.435$), which suggests that the latter may be capturing much of the phone call effect in the full model. If this is true, the finding further supports the argument that the empire measure reflects not only institutional legacies, but also ongoing contacts between the populations of countries that were once members of the same empires.

The results of the cross-sectional analysis call into question the causal narrative formulated by Inglehart and Baker (2000), in which cultural similarity was an outcome of economic development and civilizational path dependence. To be sure, development matters and it remains one of the largest effects in the models, which is complemented by a powerful and distinct effect of religiosity. However, the results are at odds with the civilizational path dependence explanation, because the criteria on which the civilizational categories are based turn out not to be significant in the analysis. The sole variable that is significant is imperial heritage, which suggests a very different historical legacy than one of primordial religious and linguistic heritage or geographic location.

Table 5. Results of regression with dyad fixed effects (dependent variable: cross-national cultural similarity)[a]

Model	1	2	3	4
Development and religiosity				
GNI per capita	1.256***			1.346***
	(0.380)			(0.377)
	0.485			*0.520*
Religiosity	0.190			0.116
	(0.259)			(0.253)
	0.080			*0.049*
Politics				
Military alliances (t-5)		−0.046		−0.149
		(0.105)		(0.107)
		−0.020		*−0.064*
IGO co-memberships (t-5)		0.024**		0.016
		(0.009)		(0.010)
		0.368		*0.237*
Democracy index		−0.050		−0.031
		(0.114)		(0.115)
		−0.048		*−0.029*
Regime durability		−0.078		−0.133
		(0.107)		(0.125)
		−0.037		*−0.062*
Trade				
Trade flow			0.035	0.035
			(0.041)	(0.042)
			0.070	*0.070*
Trade dependency			0.225	0.446
			(0.387)	(0.400)
			0.056	*0.111*
Time fixed effects				
Wave 2	0.314	0.164	0.327	0.249
	(0.027)	(0.063)	(0.021)	(0.079)
	0.420	*0.220*	*0.438*	*0.333*
Wave 3	0.224	0.029	0.234	0.068
	(0.025)	(0.105)	(0.030)	(0.115)
	0.301	*0.038*	*0.314*	*0.091*
Intercept	0.904	0.960	1.673	0.042
	(0.299)	(0.340)	(0.333)	(0.585)
N	171	171	171	153
Rho	0.779	0.827	0.812	0.796
Overall R^2	0.260	0.048	0.051	0.246
Within R^2	0.280	0.254	0.216	0.341

[a] *** $p<0.001$, ** $p<0.01$, * $p<0.05$, † $p<0.1$, one-tailed test; Coefficients followed by standard errors in parentheses and beta weights in italics.

In addition, the models offer tentative support for the contact hypothesis, whereby countries that interact with one another are more culturally similar than those that do not. The strongest contact effect was that of bilateral trade, though its impact weakened by 2000 and was replaced by the effect of cross-national interaction through inter-governmental organizations. Social network and alliance ties were also associated with cultural similarity, though these results did not persist once the other explanatory factors were taken into consideration.

Longitudinal analysis

The cross-sectional models are useful for understanding the associations between cross-national cultural similarity and a variety of country attributes, but they tell us little about the sources of cultural change. It is possible that some of the variables that explain cross-sectional variation will be poor predictors in a dynamic model and vice versa. The longitudinal structure of the data at the country level makes it possible to carry out a fixed-effects analysis, which directly examines the effects of changes in time-varying independent variables on changes in cultural similarity.

Table 5 presents the results from a QAP regression with fixed effects. Models 1 through 3 introduce economic development, religiosity, politics, and trade variables in successive steps, while Model 4 includes them all simultaneously. All four models control for unobserved time-invariant characteristics of specific country dyads, as well as for time fixed-effects, which capture any unobserved variables that that simultaneously affect all country dyads in a given time period (for instance, a global economic recession). Since the analysis focuses specifically on change over time, all time-invariant variables, such as religion and empire, are excluded from the models.[10]

The results are striking: the only two variables that strongly and consistently predict cultural change over time are similarity of countries' GNI per capita and the number of IGOs in which they have common co-memberships. The effect of GNI is significant at a $p < 0.001$ level and its magnitude is stable across the reduced and full models: a one-standard-deviation increase in the similarity of GDP per capita results in a 0.485-standard-deviation increase in cultural similarity in Model 1 and a 0.520-standard-deviation increase in Model 4. This result is consistent with modernization theory, which argues that economic development leads to convergence around a shared set of cultural attitudes.

The effects of IGO co-membership are also sizeable and significant in both the reduced and full models. A one-standard-deviation increase in the number of shared organizational memberships results in a 0.368-standard-deviation increase in cultural similarity in Model 2 and a 0.237-standard-deviation increase in Model 4. These results provide strong support for the contact hypothesis within the political realm: higher levels of cross-national interaction facilitated by international organizations result in cultural convergence over time. This finding is directly relevant for world polity theory, and particularly its hypotheses about the institutional bases of everyday culture (Meyer, 2007). Most research in the world polity tradition has examined the effects of IGO co-membership networks on institutional diffusion under the assumption that institutional practices subsequently shape the cultural preferences of individuals. However, that assumption has rarely been tested directly. The large effect of IGO co-memberships on cultural change in the present analysis provides evidence for the existence and strength of this institutional mechanism.

Interestingly, IGO co-membership was not significant in most of the cross-sectional models (except for the full model in 2000), while bilateral trade was significant and positive. These effects are reversed in the fixed-effects model: IGO co-membership is significant and trade is not, though the coefficients for the latter are weakly positive. This suggests that trade is associated with cultural similarities between countries, but changes in trade do not strongly predict changes in culture. On the other hand, IGO co-membership is weakly associated with cultural similarity at any given point in time, but an increase in shared memberships produces cultural convergence over time.

The lack of significant effects among the other variables in Table 5 is not surprising given their weak effects in the cross-sectional analysis. The one exception is religiosity, which was a major cross-sectional predictor of cultural similarity (with effects rivaling GNI in magnitude and

significance) but is not associated with cultural change in the fixed-effects models. The more similar countries are in terms of religiosity, the more similar they are culturally; however, increases in religiosity do not appear to lead to further cultural convergence.[11]

In sum, in recent years, cultural change has been a result of a twofold process: the modernizing forces of economic development and the interaction of countries through inter-governmental organizations. As countries become wealthier, their citizens become less concerned with survival and more interested in self-expression. In some contexts, particularly Western Europe, where development has coincided with secularization, they may also come to espouse less traditional attitudes. At the same time, as national states interact with one another through the network of common organizational ties, they converge on similar institutional arrangements, which in turn shape the attitudes of their populations.

Discussion

My empirical results suggest an explanation for global cultural change that modifies existing accounts in sociology and political science. Cultural similarity is a result of four processes: economic development, the social penetration of religious institutions, imperial legacies, and cross-national contact. Common imperial history, and differential levels of religiosity and trade are primarily responsible for the distribution of culture across countries, but not for cultural change itself. That is, they function as historical anchors that affect how national cultures look today and possibly (though likely decreasingly so) how they will look in the future, but they do not shape ongoing attitudinal changes from year to year. Development and cross-national contact through international political organizations, on the other hand, are directly responsible for change over time.

Despite its universalizing principles, the modernization process documented in this study need not lead to the homogenization of culture. In fact, if scholars of popular culture are correct (DiMaggio, 1987; Peterson and Kern, 1996), rising incomes and educational levels may actually lead to greater acceptance of cultural diversity, at least among some segments of society. While consumption itself may not be optional, the range of choices available to consumers has been increasing in all markets as a result of the cultural cross-pollination associated with international trade.

Furthermore, as world polity scholars have argued, modernization has given rise to a new global culture based on the primacy of human rights and the sovereignty of the individual actor, who actively processes and produces abstract knowledge and increasingly shapes his or her own identity (Meyer, 2007). Much like consumption, globalized actorhood is characterized by a tension between the universal and the particular. Its principles are homogenizing, at least in theory, because they cut across traditional cultural distinctions, but they also lead to increased diversity because they protect and celebrate the right of individuals to embrace and express their differences.

It should be stressed that the modernizing process captured by the positive effects of GNI on cultural similarity is not necessarily linear and universal. The global economic system continues to be characterized by tremendous disparities deeply rooted in a history of colonial exploitation (Wallerstein, 1974), even if inequalities between nations have declined considerably (Firebaugh, 2003). Furthermore, declining cross-national inequality has been accompanied by increasing within-nation disparities, which serve as an important reminder that the benefits of a more universalistic global culture accrue primarily to the more privileged segments of national populations. The present study does not explicitly investigate cultural heterogeneity within nations, so its conclusions can tell us little about the cultural effects of within-nation inequalities. Nonetheless,

the samples used in the analyses were nationally representative and the attitudes of the respondents were averaged within countries, so the findings described here should hold at the cross-national level despite likely differences within national populations.

The linear assumptions of modernization theory are further challenged by the strong effects of cross-national contact on cultural similarity in both the cross-sectional and fixed-effects analyses. Net of economic development, the cultural resemblance of national populations is a product of bilateral trade and IGO co-membership, which form the structure of international economic and political networks. Given that a number of recent studies in the world polity tradition have demonstrated the existence of persistent heterogeneity and clustering in the structure of IGO networks (Beckfield, 2010; Torfason and Ingram, 2010) and a resulting unevenness in trade patterns (Ingram et al., 2005), we should expect the fragmentation of culture along these network ties to continue and possibly intensify, even in the face of increased economic development.

In addition, the strong network effects revealed in the analyses provide evidence for the applicability of world polity institutionalism to the level of individual attitudes. World polity research has primarily studied the impact of cross-national contact on the diffusion of policies and institutional practices, with the implicit assumption that institutional change alters the beliefs and behaviors of individuals affected by the institutions in question. The present study tests this assumption directly, demonstrating that IGO ties between national states and international trade relations between states and private sector actors have a strong effect on the attitudes found among national populations.

The impact of cross-national economic and political interaction on culture exists alongside the effects of economic development, which suggests that the contact hypothesis is compatible with the modernizing processes identified in Inglehart and Baker's (2000) account of cultural change. However, the other key element of Inglehart and Baker's theory – the civilizational path dependence of culture – is challenged by the findings of the present study. When the criteria underlying their civilizational schema (and that of Huntington, 1993) are tested systematically across cases, they are found to have no significant effects on cultural similarity. The cultural attitudes analyzed here are not associated with common linguistic heritage, shared geographic regions, or common religious traditions in any of the three waves of data. Given the lack of evidence for the existence of cultural zones that continue to shape the patterns of cultural change or of primordial civilizations set on a collision course with one another, scholars should be skeptical about the continued use of civilizational categories in comparative cultural research. Such distinctions serve to reify culture as primordial, unchangeable, and inherently irreconcilable across social units. As we have seen, popular attitudes change too rapidly for this to be the case.

While religion (as opposed to religiosity), region, and language failed to predict cultural similarity, shared imperial history had strong positive effects in the cross-sectional analysis. Countries that once belonged to the same colonial empires, including the colonizers themselves, continue to exhibit cultural similarities. This finding is consistent with the contact hypothesis, since the empire effect is likely to be driven not only by institutional legacies of colonial rule (themselves a product of historical contact) but also by continued interactions among former colonies facilitated by a variety of inter-governmental and non-governmental organizations. The empire variable is distinct from the categories employed by Huntington and Inglehart and Baker, because it is based on a systematic criterion of group membership, it relies on realistic mechanisms, and its categories cut across cultural zones and civilizations.

Furthermore, there is nothing inherently primordial or inevitable about the cultural similarities stemming from a common imperial past. If the institutional trajectories of the countries change, so

will their cultures. Similarly, if countries under the umbrella of post-colonial international organizations choose to interact with one another less frequently, they will become less similar over time. We may expect this sort of consequence, for instance, in Mauritania, which was suspended from the Francophonie organization in 2008 or Zimbabwe, which withdrew from the Commonwealth of Nations in 2003.

Future research

The analyses in this article are limited by the scarcity of complete dyadic data on country relations. To more fully investigate the relationship between cross-national relations and cultural outcomes, researchers should take into account a number of additional measures of national interaction, including migration, trade in cultural goods, NGO co-memberships, and informal political alliances within IGOs, such as the United Nations. Better measures of economic trade are also needed to capture the increasing role of multinational corporations in the global market and the relative importance of trade in particular types of goods.

Furthermore, as is often the case with comparative research, the findings should be subjected to further tests with more extensive data that include a greater range of country cases. It is possible that a sample that more closely approximates the full population of nation-states would alter some of the results. For instance, the lack of significant effects of democracy on culture may be an artifact of the rather small variance of the democracy variable for the 19 countries included in the analysis. Similarly, religion may be found to play a more important role in producing cultural similarity if the analysis were expanded to countries with religious traditions that are underrepresented in the current sample, such as Islam, Buddhism, and Hinduism. Nonetheless, if the key mechanisms identified in the article are correct, the effects of development and cross-national contact should hold, and perhaps intensify, when more countries are added to the analysis.

The second major limitation of the present study is its lack of attention to inequality. The role played by culture in justifying inequality has been well documented by sociologists and has preoccupied most scholars of cultural globalization. Research on cultural similarities between countries cannot be complete until it considers the distribution of power (often in the form of economic capital) within and across countries. Analyzing between-country inequalities can help explain the processes that drive cultural convergence. The finding that development and cross-national interaction produce cultural similarity says little about the specific content of the culture shared by the country dyads. It is possible that structurally similar countries converge on a middle-ground cultural position or that core countries remain relatively stable, while those on the global periphery experience more profound cultural transformations. These two scenarios have widely diverging repercussions for cultural reproduction and continued global inequality.

In turn, by focusing on within-country inequality, we can better understand the underlying mechanisms that shape cultural transformations within national populations. The concept of cross-country interaction glosses over the important question of who exactly is doing the interacting. In most nations, and particularly those with developing economies, globalized cosmopolitan elites occupy vastly different social positions than less affluent groups. The extent to which a country's culture changes in response to development and cross-national interaction is likely to be influenced by the size, power, and extent of the social embeddedness of those elites. An approach sensitive to within-country inequalities could help us better understand these processes. In addition, it could also give us better purchase on the heterogeneity of cultural changes within countries. For instance, a country's increased integration into the network of global

flows and a resulting shift in cultural practices among its population may produce a cultural backlash that may be difficult to capture with aggregated country data (Lizardo, 2007). Such internal cultural dynamics can play an important role in shaping a nation's future path, with respect to both cultural change and economic development.

The need to study within-country cultural heterogeneity highlights an important possible extension of the current project. Rather than measuring the similarity of countries on the content of cultural attitudes, researchers should examine the extent to which the *structure* of collective cultural schemata changes over time (DiMaggio, 1997). The earlier example of a cultural backlash could be captured with a measure of the variance of cultural attitudes within a country and explained using similar predictors as the ones used in my analyses. Alternately, one could analyze correlations between particular attitudinal variables within national populations and then compare the correlation matrices across countries and over time. Such an approach would build on existing research in relational cultural analysis, which views meaning not as an inherent property of individual cultural objects but rather as a product of the relations between them (Mohr, 1998; Yeung, 2005).

Finally, when interpreting the results of this study, it is important to keep in mind that the dependent variable used in the analysis does not measure cross-national attitudinal variation in its entirety. Although I have been discussing 'cultural similarity' throughout this article, this has been intended as short-hand for the specific cultural variables introduced by Inglehart and Baker (2000) and reproduced here for purposes of comparability with their study. Inglehart and Baker describe their variables as capturing two fundamental axes of cultural differentiation, which they group under the common rubric of post-materialist values. I do not want to make similarly sweeping interpretations of the data. My analyses are driven less by interest in the specific content of the dependent variable and more by the goal of identifying the mechanisms that lead to greater or lesser similarity of attitudes across countries, whatever the content of those attitudes may be. Just how robust the results are to different specifications of the dependent variable is an empirical question that will require additional research. If the predictions of world polity theory are correct, we should expect cross-national interaction to produce cultural similarity across a wide variety of domains.

Although the analyses undertaken in this article have some notable limitations, they represent a first step toward a thoroughly relational model of international cultural change. Building on the work of Inglehart and Baker (2000), who laid the foundations for the analysis of aggregate country-level cultural characteristics using the World Values Survey, the present study provides additional evidence for the cultural consequences of economic development and religiosity. However, in contrast to earlier work, the study demonstrates the need to move beyond country classification schemes based on inconsistent criteria and the importance of taking into consideration the dynamic cross-national interactions that constitute global networks of political, economic, and civil society relations. By carrying out a rigorous relational analysis using three waves of data, this article produces an account of cultural similarity and change that augments existing narratives of cultural convergence and civilizational conflict.

Acknowledgements

Appendix 1. Pairwise correlations between variables used in the cross-sectional and fixed-effects analyses

Variable	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A Cultural similarity	—														
B GNI per capita	0.421	—													
C Religiosity	0.463	0.208	—												
D Empire	0.266	0.066	0.208	—											
E Religion	0.107	0.008	0.142	0.213	—										
F Geographic region	0.080	0.109	0.065	0.244	0.132	—									
G Language	0.069	0.220	0.160	0.364	0.232	0.068	—								
H Military conflict	0.042	−0.001	−0.019	0.129	0.071	0.135	0.135	—							
I Military alliances	0.167	0.140	0.143	0.258	0.178	0.157	0.168	0.132	—						
J IGO co-memberships	0.228	0.180	0.030	0.075	0.152	0.391	0.158	0.070	0.274	—					
K Democracy index	0.135	0.431	0.293	0.042	−0.042	0.135	0.134	−0.150	0.122	0.264	—				
L Regime durability	0.168	0.115	0.156	0.014	−0.012	−0.032	0.014	0.068	−0.135	0.174	−0.023	—			
M Trade flow	0.226	0.107	−0.002	0.197	0.164	0.288	0.086	0.206	0.313	0.575	0.010	0.082	—		
N Trade dependency	−0.021	0.057	0.014	−0.066	0.020	0.180	0.021	−0.075	0.054	−0.050	−0.096	0.012	0.029	—	
O Phone calls	0.234	0.091	0.185	0.435	0.188	0.394	0.113	0.284	0.240	0.208	−0.055	0.050	0.323	−0.054	—

Notes

1. The relative lengths of the x- and y-axes in the figures are distorted to facilitate presentation, but the scales are of equal range. As a result, movement along the horizontal dimension appears more pronounced than movement along the vertical dimension. In fact, countries shift considerably along both dimensions over the three waves of the data.
2. I refer to the 1990, 1995, and 2000 waves of data for shorthand. In fact, the WVS data were collected in various years between 1990 and 2001 and all independent variables are merged with the WVS data based on the actual year of WVS data collection. For dyads consisting of countries with different years of data collection, the independent variables are averaged over the intervening years.
3. Western and Eastern European countries are grouped together into a single European category because the two regions are political and cultural rather than geographic. Similarly, Mexico is assigned to North America because Latin America is a linguistic and imperial category, not a geographic region.
4. Inglehart and Baker (2000) acknowledge Huntington's influence, though they do not endorse his predictions about future civilizational conflicts.
5. To directly test the empirical utility of Huntington's scheme, which served as the basis for Inglehart and Baker's cultural zones but was not developed specifically for use with their data, I regressed the dyadic cultural similarity variable on co-membership in Huntington's civilizations, controlling for a number of other variables. The civilization variable was not significant in any of the models. These results are available upon request.
6. Standard regression diagnostics for multicollinearity, heteroskedasticity, influential cases, and outliers were carried out for all the models in the analyses. No problems were identified.
7. I also carried out analyses using other measures of development, including urbanization, educational attainment, literacy, and life expectancy. These variables did not have significant effects on cultural similarity net of GNI and their inclusion did not substantially alter the effects of other predictors. Because unpacking the mechanisms through which modernization operates is not my primary objective in the present study and the alternate measures of development had missing data for some of the countries in the sample, I have omitted these variables from the analysis. Results of the supplementary analyses are available upon request.
8. In a separate analysis, I reran the model without the empire measure and the results were the same: none of the other systematic country grouping variables (i.e. religion, region, and language) were significant. I also tested the country grouping models in Table 4 for multicollinearity and found no reasons for concern. The VIF scores ranged from 1.07 to 1.24, well below the conventional threshold of 10.
9. It should be pointed out, however, that the IGO and trade variables are not collinear. In the full model, their VIFs are 2.59 and 2.11, respectively. This is higher than the VIFs for the other variables in the model, which range from 1.10 to 1.55, but is still below the conventional threshold of 10.
10. International conflicts are also excluded due to the lack of variance over time in the cumulative number of dyadic conflicts for the countries in the sample.
11. It is also possible that changes in religiosity do impact changes in culture, but that these effects are subject to longer time lags. This possibility could not be tested in the present analyses due to data limitations.
12. For a breakdown of the variables that constitute the two cultural scales, see Table 1.

References

Appadurai A (1996) *Modernity at Large: Cultural Dimensions of Globalization*. Minneapolis: University of Minnesota Press.

Barber B (1995) *Jihad vs. McWorld: How Globalism and Tribalism Are Reshaping the World.* New York: Times Books.

Barbieri K, Keshk O and Pollins B (2008) *Correlates of war project trade data set codebook, version 2.0*. Available at: http://www.correlatesofwar.org.

Barro R and McCleary RM (2003) *International Determinants of Religiosity*. National Bureau of Economic Research. Available at: http://ideas.repec.org/p/nbr/nberwo/10147.html, accessed 11 May 2010.

Beckfield J (2010) The social structure of the world polity. *American Journal of Sociology* 115: 1018–1068.

Bonikowski B (2005) Dancing to Darwin's beat: Cultural niche dynamics in sociodemographic space. Paper presented at the annual meeting of the American Sociological Association, Philadelphia, PA, 14 August.

Bourdieu P (1984) *Distinction: A Social Critique of the Judgment of Taste*. Cambridge, MA: Harvard University Press.

Collins R (2004) *Interaction Ritual Chains. Princeton*, NJ: Princeton University Press.

Cowen T (2004) *Creative Destruction: How Globalization is Changing the World's Cultures*. Princeton, NJ: Princeton University Press.

DiMaggio P (1987) Classification in art. *American Sociological Review* 52: 440–455.

DiMaggio P (1997) Culture and cognition. *Annual Review of Sociology* 23: 263–287.

DiMaggio P and Powell WW (1983) Iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review* 48: 147–160.

Eisenstadt S (1982) The axial age: The emergence of transcendental visions and the rise of clerics. *The European Journal of Sociology* 23: 294–314.

Fox J and Monnette G (1992) Generalized collinearity diagnostics. *Journal of the American Statistical Association* 87: 178–183.

Finke R and Stark R (1993) *The Churching of America, 1776–2005: Winners and Losers in Our Religious Economy Revised*. New Brunswick, NJ: Rutgers University Press.

Firebaugh G (2003) *The New Geography of Global Income Inequality.* Cambridge, MA: Harvard University Press.

Friedkin NE (1998) *A Structural Theory of Social Influence*. Cambridge: Cambridge University Press.

Friedman T (1999) *The Lexus and the Olive Tree: Understanding Globalization*. New York: Farrar, Straus Giroux.

Ghosn F, Palmer G and Bremer S (2004) The MID3 data set, 1993–2001: Procedures, coding rules, and description. *Conflict Management and Peace Science* 21: 133–154.

Huntington SP (1993) The clash of civilizations? *Foreign Affairs* 72: 22–49.

Hussain N (2003) *The Jurisprudence of Emergency: Colonialism and the Rule of Law*. Ann Arbor: University of Michigan Press.

Inglehart R and Baker WE (2000) Modernization, cultural change, and the persistence of traditional values. *American Sociological Review* 65: 19–51.

Inglehart R and Carballo M (1997) Does Latin America exist? (And is there a Confucian culture?): A global analysis of cross-cultural differences. *Political Science and Politics* 30: 34–47.

Ingram P, Robinson J and Busch ML (2005) The intergovernmental network of world trade: IGO connectedness, governance, and embeddedness. *American Journal of Sociology* 111: 824–858.

Krackhardt D (1988) Predicting with networks: Nonparametric multiple regression analysis of dyadic data. *Social Networks* 10: 359–369.

Leeds BA, Ritter JM, Mitchell S and Long AG (2002) Alliance treaty obligations and provisions, 1815–1944. *International Interactions* 28: 237–260.

Levitt T (1983) Globalization of markets. *Harvard Business Review* 61: 92–102.

Lizardo O (2007) Globalization and culture: A sociological perspective. Department of Sociology, University of Notre Dame, Notre Dame, IN, unpublished manuscript.

Mahoney J (2003) Long-run development and the legacy of colonialism in Spanish America. *American Journal of Sociology* 109: 50–106.

Mapping Globalization (2007) *International Phone Calls 1983–1995*. Princeton, NJ: Princeton University and Seattle, WA: University of Washington.

Mark N (1998) Birds of a feather sing together. *Social Forces* 77: 453–485.

Marshall MG and Jaggers K (2005) *Polity IV project: Political regime characteristics and transitions, 1800–2004. Dataset users' manual*. Center for Global Policy, George Mason University, Arlington, VA. Available at: http://www.cidcm.umd.edu/polity/data/p4manualv2004.pdf, accessed 15 January 2007.

McPherson JM (1983) An ecology of affiliation. *American Sociological Review* 48: 519–532.

Meyer JW (2007) Globalization: Theory and trends. *International Journal of Comparative Sociology* 48: 261–273.

Meyer JW, Boli J, Thomas GM and Ramirez FO (1997) World society and the nation-state. *American Journal of Sociology* 103: 144–181.

Meyer JW, Bromley P and Ramirez FO (2010) Human rights in social science textbooks: Cross-national analyses, 1970–2008. *Sociology of Education* 83: 111–134.

Mohr J (1998) Measuring meaning structures. *Annual Review of Sociology* 24: 345–370.

Moody J (2004) The structure of a social science collaboration network: Disciplinary cohesion from 1963 to 1999. *American Sociological Review* 69: 213–238.

Ohmae K (1990) *The Borderless World*. New York: Harper Business.

Olsson O (2009) On the democratic legacy of colonialism. *Journal of Comparative Economics* 37: 534–551.

Peterson R and Kern R (1996) Changing highbrow taste: From snob to omnivore. *American Sociological Review* 61: 900–907.

Pevenhouse J and Nordstrom T (2003) *Intergovernmental Organizations, 1815–2000: A New Correlates of War Data Set*. Madison: University of Wisconsin and University: University of Mississippi.

Ragin C (1987) *The Comparative Case Method: Moving beyond Qualitative and Quantitative Strategies*. Berkeley: University of California Press.

Reich R (1991) *The Work of Nations: Preparing Ourselves for 21st Century Capitalism*. New York: Alfred A. Knopf.

Ritzer G (1993) *The McDonaldization of Society*. Thousand Oaks, CA: Pine Forge Press.

Scheppele KL (2008) Le droit de la sécurité international: Le terrorisme et l'empire sécuritaire de l'après–11 septembre 2001. *Actes de la Recherche en Sciences Sociales* 173: 28–43.

Schiller HI (1993) Transnational media: Creating consumers worldwide. *Journal of International Affairs* 47: 47–58.

Schram W (1964) *Mass Media and National Development: The Role of Information in the Developing Countries*. Stanford, CA: Stanford University Press.

Simpson WB (2001) QAP: The quadratic assignment procedure. Paper presented at the North American Stata Users' Group Meeting.

Torfason MT and Ingram P (2010) The rise of global democracy: A network account. *American Sociological Review* 75: 355–377.

Van Der Bly MCE (2007) Globalization and the rise of one heterogeneous world culture: A microperspective of a global village. *International Journal of Comparative Sociology* 48: 234–256.

Wallerstein I (1974) *The Modern World-System*. New York: Academic Press.

Watts DJ and Strogatz SH (1998) Collective dynamics of 'small-world' networks. *Nature* 393: 440–442.

World Bank (2006) *World Development Indicators 2006*. Washington, DC: The World Bank.

World Factbook (2007) Central Intelligence Agency, Washington, DC. Available at: https://www.cia.gov/library/publications/the-world-factbook, accessed 18 January 2007.

Yeung K (2005) What does love mean? Exploring network culture in two network settings. *Social Forces* 84: 391–420.