

ON THE CAUSES AND CONSEQUENCES OF CROSS-CULTURAL DIFFERENCES: AN ECONOMIC PERSPECTIVE*

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ABSTRACT: This review summarizes a recent body of research within economics that seeks to explain contemporary cross-societal differences in culture. One line of research traces the effects of determinants in the distant past, and studies how they affect the evolution of cultural traits and their transmission across multiple generations. Another line takes a shorter-term and more micro-level perspective to study how events faced by an individual or group affect their culture. Most recently, this line of inquiry has turned to the question of how cultural traits interact with economic factors; in particular, how cultural differences can inform the optimal design of economic and social policy and how such policies can, in turn, shape the evolution of cultural traits.

Keywords: Culture, values, norms, historical determinants.

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1. Introduction

It is now widely recognized that there is important and sizeable variation across societies in their traditional practices, cultural traits, values and beliefs (Henrich et al., 2010b). Although societies exhibit significant within-group differences, there are also important differences across societies (Desmet et al., 2017). Importantly, when studying culture, defined as values, beliefs, and knowledge that are transmitted between individuals, it is found that Western societies are not typical (Henrich et al., 2010b). The characteristics of these 'WEIRD' societies (Western, educated, industrialized, rich, and democratic) are exceptional and tend to be very different from most of the rest of the World.

This review examines recent research within economics that attempts to better understand this cross-cultural variation. In doing this there are two sets of questions that the literature has attempted to make progress on. The first set is related to the issue of the origins of this variation. Where do the differences come from and can existing variation be explained by a systematic historical and evolutionary processes? If the determinants are historical, how far back in time do they go? Do short-run factors also affect culture and how easy is it to affect these traits? The second set of questions relates to the consequences of cultural variation. What are the effects of these differences? Do they matter for economic wellbeing and what do they imply for policy?

This review will consider the progress made on these issues within the field of economics over the past decades. While it is clear that much progress has been made outside of economics, and that the field regularly draws inspiration and insights from other fields, the focus here will be on the literature that has had influence in the field. While I do not think that what has been learned is greater or more important in any way than insights gained in other fields, I do think that readers will be less familiar with this line of research and it is what I know most well. I have found that economists and those in other disciplines are often working on the same questions that seek to better understand human behavior and the nature of societies generally. This article is an attempt to provide a summary of the research coming out of the economics discipline that attempts to understand the origins of global differences in culture and their consequences today.

2. Conceptual Framework

Before turning to an overview of the empirical research on the determinants of cross-societal differences in cultural traits, particularly those that affect economic behavior, I first pause to provide a conceptual and theoretical framework that will help in interpreting the empirical evidence that I review.

The starting point is a recognition of the fact that human beings have cognitive limits. Acquiring and processing information has an opportunity cost. The time and effort could be directed towards other productive activities. In the face of these limits, we have developed heuristics or short-cuts that aid in our decision-making. These are “fast and frugal” (Gigerenzer and Goldstein, 1996, Todd and Group, 1999). It is these short-cuts that I view as comprising an important part of culture.

The (mathematical) theory behind this has been well developed, beginning decades ago with Boyd and Richerson (1985) and Rogers (1988), among others. The theories model a situation where a decision must be chosen, with some choices being better than others. The environment is variable and so the optimal choice is not easily known with certainty. Individuals can either collect information and figure out the optimal action on their own or rely on the culture/norms/traditions/etc that have evolved over time. This is done by simply copying the action of a representative (i.e., randomly chosen) person from the previous generation. This effectively models the process of transmission of cultural traits across generations. The theory shows that under very general conditions, there will always be some proportion of the population that relies on the cultural traditions of the previous generation (e.g., Boyd and Richerson, 1985, Aoki and Feldman, 1987, Rogers, 1988, Feldman et al., 1996, Boyd and Richerson, 2005).

The logic of these models provides a foundation for understanding why culture exists, how and why it affects economic decisions, and why it tends to be sticky over time. In the models, a change in the environment and the action that is optimal in that setting will cause the transmitted behavior to change over time, but this does not occur instantaneously. The traits evolve based on their net benefit relative to other traits in the population. Thus, the models predict that, under fairly general conditions, we should observe the existence of types that rely on decision-making heuristics like accumulated culture, norms, or traditions. This is because they allow for quick and easy decision-making heuristics, which are shaped through evolutionary forces over time as they

are transmitted from one generation to the next.

There are many real-world examples of functional norms or traditions evolving and being followed despite the population not knowing their benefits. My favorite example is the alkali processing of maize, which is the traditional method of preparing maize in Latin America. During the process, dried maize is boiled in a mixture of water and either limestone or ash, before being mashed into dough, which is then eaten. Although it was unknown at the time, putting limestone or ash in the water before boiling prevents pellagra, a disease resulting from niacin deficiency, which occurs in diets that consist primarily of maize. This is because the alkaline solution that results from the inclusion of limestone or ash increases the body's absorption of niacin (Katz et al., 1974).¹

The theory highlights an important benefits of culture: it allows individuals to accumulate knowledge either over generations through vertical or oblique transmission, or also across individuals within the same generation through horizontal transmission. Through such processes individuals are able to learn by relying on the accumulation of knowledge. Culture provides an effective short-cut to decision-making that is cheap and effective.

A corollary of the theory is that the historical environment, through evolutionary forces can affect culture today. In particular, historical shocks, even if when temporary, if they are large enough, can leave their imprint on modern cultural traits. A sizeable literature within the field of economics has sought to test which factors affect cultural evolution. As we will discuss, ample evidence has been put forth that many important historical events – such as Africa's slave trades, pre-industrial agriculture, colonial missions, or ancient Kingdoms – have detectable effects today. Further, studies also find that long-run historical factors are not all that matters. Events within one's lifetime – such as economic or social conditions within one's childhood or youth – have been shown to also affect culture. Before turning to an examination of this line of research, we first pause to discuss the fundamental question of the measurement of cultural traits in the economics literature.

¹For other examples and additional evidence along these lines, see Henrich (2015).

3. Global variation in cultural traits

I now turn to a discussion of the patterns of variation in cultural traits globally. An extensive body of research has developed documenting cultural and psychological variation outside of economics (Schwartz and Sagiv, 1995, Hofstede, 2001, House et al., 2004, Gelfand et al., 2011). While this body of work has clearly been extremely influential, my review will focus on progress that has been made within field of economics, in part, because this area of research is likely to already be less well-known to the reader.

Many strategies have been developed to measure cultural traits. One is to use survey questions. However, there are several potential concerns with this strategy. First, there is typically little at stake when survey respondents answer questions. Second, it is difficult to assess whether the variation in answers is being driven by cultural differences or whether it is driven by differences in the environment that they live in. For example, variation in the standard trust question could be due to cultural differences in how trusting groups are, but it could also be due to differences in the institutional or legal environment which affects whether individuals behave in a trustworthy manner or not. More generally, when looking across individuals or societies, a lot of other factors also vary. In the face of this difficulty, experimental methods are often used. Here artificial situations are constructed, where all individuals face the same external environment, including the same set of players, material payoffs, and available actions. Since everything else is being held constant, one can be more confident that any variation in behavior that is observed is due to differences in culture.

Over the past decades, a greater effort has been made to bring standardized experimental 'games' – the common being the dictator, ultimatum, public goods, and trust games – to a wide range of societies across the globe. One of the best-known early studies of this type was Joseph Henrich's (2000) study, which implemented the ultimatum game among the Machiguenga, a small scale horticultural society living in the Peruvian Amazon. In the ultimatum game, a fixed amount of money or resources is divided between two players (player 1 and player 2). Player 1 first offers a division of the resource. Player 2 then can accept or reject this offer. If player 2 accepts the offer, then the players get the division proposed by player 1 and the game ends. If player 2 rejects the offer, then both players get zero and the game ends. The behavior of the Machiguenga was compared to behavior from a population of UCLA students, as well as behavior from previous

studies, which include populations from Jerusalem, Yugoslavia, Pittsburgh, and Tokyo (Roth et al., 1991); Indonesia (Cameron, 1999); and Tucson (Hoffman et al., 1994). Within this set of groups, the Machiguenga were unique in their behavior. While, in nearly every other population, the modal offer made by player 1 in the ultimatum game was for player 2 to have 50% of the total, among for the Machiguenga, this offer was only 15%. Interestingly, the only other population to deviate from 50% was the population from Indonesia, whose modal offer to the other player was 40%.

The findings from Henrich (2000) suggested that the Machiguenga were somehow unique or peculiar. In subsequent studies, undertaken by Henrich and coauthors, the same experiments were implemented in a larger set of populations. In Henrich et al. (2001), the ultimatum game was implemented in 15 small scale societies. As with the case of the Machiguenga, there were many groups with modal offers to the other player that were significantly different from 50%, including the Hadza (Tanzania), Tsimane (Bolivia), Qichua (Ecuador), Torguud (Mongolia), Khazax (Mongolia), Mapuche (Chile), Aug (Papua New Guinea), Gnau (Papua New Guinea), and Ache (Paraguay). In fact, roughly as many populations had model offers significantly lower than 50% as had 50%. This basic finding was replicated in Henrich et al. (2005) and Henrich et al. (2010a), both of which compared variation between new sets of societies. Again, significant deviations from the 50-50 split were common in approximately half of the locations sampled. Thus, the subsequent research showed that the Machiguenga no longer appeared exceptional. In Henrich (2000), the Machiguenga were the only population from a less-developed (unindustrialized) society. Once one began to include a more complete range of populations, it became clear that the Industrialized Western European samples are not the typical but appear to be the outliers. This is a point that is made clear by Henrich et al. (2010b).

A number of studies have found that behavior in experimental games does correlate with the same or relative behavior in real life, thus, providing support for their use as a tool to measure cross-cultural variation. For example, games that measure the extent to which individuals cheat or engage in dishonest behavior by asking individuals to roll a die or dice (in some versions participants flip a coin) and then report what they roll, which determines their payoff. This provides an opportunity for them to gain money by being dishonest. In the experiments, it generally isn't possible for the experimenter to know if an individual lied at any point in time, but with larger groups of individuals, it is possible to detect lying statistically since the distribution of

outcomes will differ from what is expected. Several of studies have found that cheating behavior in these games correlates strongly with cheating in real life, as measured by misbehavior in school by Swiss students (Cohn and Marechal, 2016), absence from work by government nurses in India (Hanna and Wang, 2017), dilution of milk by small-scale milk-sellers in India (Kroell and Rustagi, 2019), or misconduct during prison time of inmates in a maximum-security prison in Switzerland (Cohn et al., 2015).

Once concern with experiments is that participants know they are in an artificial experiment and therefore their behavior may be driven by this fact. Of particular concern is that experimenter demand effects influences behavior. This concern has led a number of studies to measure culture using 'natural experiment' or 'lab-in-the field' experiments. For example, Miguel and Fisman (2007) use the number of accumulated unpaid parking tickets by Diplomats in Manhattan as a measure of a culture of corruption in the Diplomat's home country. Along similar lines, Miguel et al. (2011) use the number of accumulated yellow and red card fouls by international European professional soccer players born. They interpret this as a measure of a culture of violence and show that it correlates with the prevalence of civil war in the country when the player was growing up.

An example of a recent 'lan-in-the-field' experiment is found in the recent study by Cohn et al. (2019) that attempts to obtain credible and comparable measures of civic honesty across the globe. To do this, they dropped 17,3030 wallets in 355 cities in 40 countries across the globe. The wallets, which are shown in Figure 1, were clear so that all contents could be easily seen. Each wallet contained business cards, a shopping list, money, and a key. The exact amount of money was varied in different versions of the experiment. The authors use the rate at which the wallets were returned as a measure of civic honesty. Country level averages are reported in Figure 1. One perhaps surprising finding from the study, which is also shown, is that in nearly all settings, honesty was greater when the wallets had money in them.

While experiments remain a credible and convincing way to measure cultural traits, they are costly and logistically difficult to implement. A number of recent studies confirm that surveys provide a reliable alternative when experiments are not feasible. Johnson and Mislin (2011) compares trust game behavior from 23,000 participants in 162 experiments with survey data from standard trust questions across 162 countries. The authors find that self-reported trust correlates very strongly with how much money one sends to player 2 in the trust game (i.e., how much

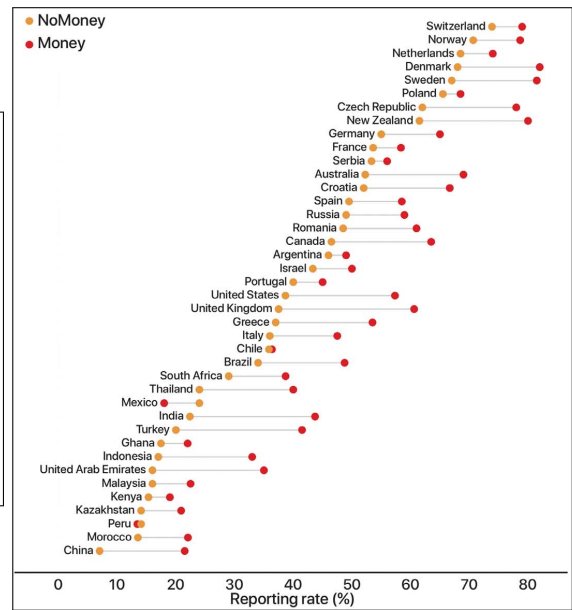


Figure 1: Wallet used to measure civic honesty around the World (left) and country-level averages in the return rate for wallets without and with money.

player 1 trusts player 2). Falk et al. (2016) study 409 participants and assess the comparability of experimental behavior and survey questions that measure risk aversion, time discounting, trust, altruism, positive reciprocity, and negative reciprocity. They find that behavior in the experiments correlates very highly with survey measures aimed at capturing the same traits.² Recent evidence also seems to indicate that an individual's response to survey questions may be more stable over time relative to behavior in experiments (Chuang and Schechter, 2015).

A number of studies have attempted to gain an understanding of the global variation in cultural traits at a very micro level using individual-level survey data. Desmet et al. (2017) study within and between ethnic group variation using measures of cultural traits distilled from the *World Values Survey*. They find that within countries, the variation within ethnic groups is much greater than the average differences between ethnic groups. According to their calculations, less than 2 percent of the total variation in their cultural measures is explained by average differences between ethnic groups. Interestingly, when the same exercise is performed, but for countries rather than ethnic groups, they find that about 12 percent of total variation is explained by average cross-country differences, which is a sizeable proportion. In a follow-up study, Desmet and Wacziarg (2019) undertake a similar exercise but look at different groups

²The correlation coefficients are: 0.41 for risk aversion, 0.59 for time discounting, 0.67 for trust, 0.42 for altruism, 0.58 for positive reciprocity, and 0.37 for negative reciprocity.

within the United States using the *General Social Survey*. They create 11 different groups based on different attributes, such as gender, religion, race, income, region, education, etc. They also find that the between-group differences are small when compared to within-group variation. They also examine between-group differences over time and find that, in general, they fell from 1972 until the late 1990s and then rose thereafter (Desmet and Wacziarg, 2019).

The findings, while interesting, are somewhat hard to assess since there is so much idiosyncratic variation (i.e., noise) in the survey measures. As Falk et al. (2016) have shown, even experimental measures of cultural traits can be very different when measured using the same person but at different points in time. The same is also true for survey questions. Survey questions that measure the same cultural trait are often weakly correlated with one another (Falk et al., 2018). All of this suggests that our measures of traits, whether surveys or experiments, likely contain a significant amount of noise, which, if Gaussian, will tend to increase variation across individuals and not across groups. Thus, it is hard to assess how much of the variation that we see across individuals is due to true differences and how much is due to imprecision in measurement.

The findings from Falk et al. (2018), which are taken from their recent *Global Preferences Survey* (GPS), contrast those of (Desmet and Wacziarg, 2019). The GPS is an experimentally-validated survey module that reports individual-level measures (based on principal components) for patience, risk-taking, positive reciprocity, negative reciprocity, altruism, and trust. Falk et al. (2018) find that across countries, their measured traits “vary substantially across countries” (p. 1663). They report that for each trait, cross-country differences tend to be statistically significant – i.e., about 80% of pairwise comparisons are significant. It is difficult to compare this to the 12 percent figure from Desmet et al. (2017). Falk et al. (2018) do not examine variation across ethnic groups.

The cross-individual within-group variation documented by economists dovetails nicely with recent research in psychology on the ‘tightness’ of cultural norms; that is, the extent to which norms are well defined and deviation from their isn’t tolerated in a society (see Gelfand, 2018). Given that values, beliefs, and norms are not everywhere perfectly ‘tight’, then we would expect some individual-level variation within groups. What hasn’t yet been done is the examination of whether the within-group variation measured in the papers discussed above lines up with existing measures of cultural ‘tightness’, either across countries, time or states within the United States (Gelfand et al., 2011, Harrington and Gelfand, 2014). One would expect greater within-group variation in cultural traits to be negatively correlated with the tightness of norms.

Although these findings are purely descriptive, they do raise some interesting questions. It appears that country-level factors may have some effect on cultural values. This likely arises due to national-level laws, institutions, policies, and shared historical factors being important determinants of cultural values. The evidence for such determinants will be described below.

4. Longer-run determinants

Given the variation that we observe in cultural traits globally, the natural next question to ask is what explains these differences. The early research, which use experiments to study cross-cultural variation in cultural traits, took initial steps towards answering this question. For example, Henrich et al. (2001), Henrich et al. (2005), and Henrich et al. (2010a) document that a higher offer in the ultimatum game is associated with the extent to which consumption within the society occur through market exchange and interactions with non-kin. Henrich et al. (2010a) also shows that this behavior is correlated with the presence of world religions that feature a moralizing high God.

Since these first studies, there has been an explosion of research within economics that has taken additional steps to better understand the origins of the differences in cultural traits that we observe in the world today. There are several noteworthy characteristics of this body of research. First, studies tend to involve the construction of new historical datasets often from archival or other primary sources. These data allow researchers to examine deep historical determinants and to study how they affect the subsequent evolution of cultural traits. Examples of these include historical state formation, colonial policies, missionary activities, warfare, subsistence activities, migration, or trade. Second, the studies have been particularly successful at making progress on the issue of causality. As is well known, just because there is a statistical relationship between a historical factor and a cultural trait does not mean that the factor caused the trait. The determinant could have been caused by the cultural trait and not the other way around (i.e. reverse causality). It is also possible that both the trait and the determinant are caused by other factors (i.e., omitted variables bias). The studies in this literature share a common attempt to, as much as is possible, gain confidence in whether the factors being studied are truly causal determinants or not. This is done through several statistical strategies, including the use of natural experiments, instrumental variables, regression discontinuity, difference-in-difference estimates,

or randomized control trials.

Table 1 provides a brief overview of some of the most prominent studies from the economics literature. The table indicates the citation, with the full reference reported at the end of the chapter; the cultural trait being explained; the long-run determinant being studied; the unit of analysis (e.g., individuals, ethnic groups, countries, etc); the scope of the sample used in the analysis; and the statistical identification strategy employed in the study to obtain causal estimates. A description of the different identification strategies is provided in the table notes.³

From the table, it is clear that the literature being summarized is very young. The oldest reported study is from 2007 and the vast majority of studies are from the last decade. The dearth of earlier studies reflects the previous reluctance of the discipline to acknowledge real deviations from a narrow definition of rationality and to study other determinants of behavior like values, beliefs, and morals. It is no coincidence that the recent increase in research seeking to better understand culture, including its historical origins, follows on the heels of the rise of behavioral economics and its movement into the mainstream in the profession.

The literature, especially early on, focused on some of the largest shocks that have occurred historically and their most likely consequences. An early example of such research is a study with Leonard Wantchekon that examines the consequences of the trans-Atlantic and Indian Ocean slave trades (Nunn and Wantchekon, 2011). The trades were responsible for the shipment of over 20 million people from the African continent over nearly five centuries (Nunn, 2008). Many more were either killed or adversely affected in a very significant way by the slave trades. The built on an earlier study of mine that showed that these slave trades (in addition to the continent's trans-Saharan and Red Sea slave trades) had adverse long-term economic effects (Nunn, 2008). Looking into micro-level historical accounts of the manner that slaves were captured, we found that a large proportion of the slaves were taken by those close to them such as fellow villagers, neighbors, friends, and even family members. An example of such evidence is reported in Table 2. The underlying data are from interviews conducted as part of a mid-19th Century study by the German linguist Sigismund Koelle (1854). The statistics in the table are consistent with the many accounts of children being kidnapped and sold into slavery or of friends or family turning on one another and selling each other into slavery due to disagreements or disputes. A well-known

³The body of research overlaps significantly with a line of research that seeks to understand the long-run effects of historical events and particularly their importance for contemporary outcomes. For recent reviews of this literature see Nunn (2009, 2014, 2020) and Spolaore and Wacziarg (2013).

Table 1: Overview of the economics literature on the long-term determinants of cultural traits.

| Study | Trait being explained | Determinant being tested | Unit of observation | Scope of sample | Statistical strategy |
|---|--|---|---------------------------------------|----------------------------------|-------------------------|
| Alesina & Fuchs-Schündeln (2007) | Preferences for government redistribution | Communism | Individuals | East and West Germany | Natural experiment, OLS |
| Alesina <i>et al</i> (2013) | Gender roles & gender attitudes | Plough agriculture | Individuals, ethnicities, countries | Global | OLS, IV |
| Alesina <i>et al</i> (2018) | Male-female sex ratio if children | Plough agriculture | Countries | Global | OLS, IV |
| Alsan & Wanamaker (2018) | Trust of medical system | Tuskegee experiment | Individuals | United States | DD |
| Andersen <i>et al</i> (2017) | Work ethic | Catholic Order of Cisercians | Counties | England | OLS |
| Ang (forthcoming) | Individualism | Labor intensive agriculture | Countries, ethnicities | Global | OLS |
| Ang and Fredriksson (2017) | Strength of family ties | Wheat agriculture | Individuals, districts, countries | United States and Global | OLS |
| Baranov <i>et al</i> (2018) | Attitudes about gay marriage | 19th Century sex ratios | Individuals, counties | Australia | OLS, IV |
| Bazzi <i>et al</i> (2018) | Individualism/collectivism | Frontier experience | Counties | United States | OLS, DD, IV |
| Becker (2019) | Female genital cutting | Pastoralism | Individuals, ethnic groups | Africa, global | OLS, IV |
| Becker <i>et al</i> (2016) | Trust of state bureaucracy | Habsburg empire | Individuals | Eastern Europe | RD |
| Ben Yishay <i>et al</i> (2017) | Matrilineal inheritance | Presence of coral reefs | Islands and ethnic groups | Global | OLS |
| Blouin (2018) | Interpersonal trust | Colonial production quotas | Individuals | Rwanda | Natural experiment, OLS |
| Brodeur & Haddad (2019) | Attitudes towards homosexuality | 19th Century gold rush | Counties | United States | OLS, DD |
| Campa & Serafinelli (forthcoming) | Attitudes towards gender equality | Communism | Women, cohorts | Germany, Central & E. Europe | IV, RD, DD |
| Campante & Yanagizawa-Drott (2016) | Authoritative parenting style | Father's war experience | Individuals | United States | Natural experiment, IV |
| Cervellati <i>et al</i> (2019) | Ethnic affiliation, endogamy | Prevalence of malaria | Individuals, ethnic groups | Africa | OLS |
| Chaudhary <i>et al</i> (2019) | Cooperation (contribution to a public good) | Colonial rule (direct vs. indirect) | Individuals, villages | Rajasthan, India | Natural experiment |
| Cornelson (2018) | African American educational attainment | Role models from Cosby Show | Cities & birth cohorts | United States | DD, IV |
| Couttenier <i>et al</i> (2017) | Homicides | Timing of mineral discoveries | Counties | United States | OLS |
| Dell <i>et al</i> (forthcoming) | Cooperation | Dai Viet Kingdom | Villages, individuals | Vietnam | RD |
| Dell & Querubin (2018) | Attitudes towards the U.S. | Military bombing | Villages, individuals | Vietnam | RD |
| Enke (2019) | Universal/limited morality | Strength of kinship ties | Individuals, ethnic groups, countries | Global | OLS, IV |
| Fernandez <i>et al</i> (2004) | Gender attitudes | Female wartime employment during WWII | Married women | United States | OLS, DD |
| Fouka & Schlapfer (forthcoming) | Work ethic | Marginal returns to labor of crop mix | Individuals, districts, countries | Europe | OLS |
| Galor & Ozak (2016) | Patience | Agricultural suitability of traditional crops | Individuals, countries | Global | OLS, DD |
| Galor & Savitskiy (2018) | Loss aversion | Climatic volatility | Individuals, ethnic groups, countries | Global | OLS |
| Gershman (2019) | Supernatural beliefs | Trans-Atlantic slave trade | Individuals, ethnic groups, regions | Africa and Latin America | OLS, IV |
| Giuliano & Nunn (2013) | Support for democracy | Traditional village leadership | Individuals, countries | Global | OLS |
| Giuliano & Nunn (2019) | Importance of tradition | Similarity of environment across generations | Individuals, ethnic groups, countries | Global | Natural experiment, OLS |
| Grosjean (2014) | A culture of honor | Scotch-Irish immigration | Counties | United States | OLS |
| Grosjean & Khattar (2019) | Attitudes about gender equality | 18th Century male-biased sex ratios | Counties | Australia | IV |
| Guiso <i>et al</i> (2016) | Self-efficacy, civic mindedness | Medieval independent city states | Individuals, villages | Italy | IV, DD, OLS |
| Heldring (2018) | Obedience to state | State formation | Individuals | Rwanda | Natural experiment |
| Karaja & Rubin (2017) | Interpersonal trust | Habsburg vs. Ottoman/Russian state | Individuals, villages | Region of Romania | Natural experiment |
| Lowes <i>et al</i> (2017) | Rule following | State formation | Individuals | Province in the DRC | Natural experiment |
| Lowes & Montero (2017) | Trust in Western medicine | Colonial medical Campaigns | Individuals, districts | French Colonial Africa | IV, OLS |
| Lowes & Montero (2019) | Social cohesion | Forced rubber collection | Individuals, villages | Democratic Republic of the Congo | RD, OLS |
| Michalopoulos (2012) | Ethnic affiliation | Variation in agricultural suitability | Grid cells | Global | OLS |
| Michalopoulos <i>et al</i> (2018) | Adherence to Islam | Trade routes, land suitability | Countries or ethnic groups | Global | OLS |
| Moscona <i>et al</i> (2017) | Ingroup and outgroup trust | Traditional segmentary lineage organization | Individuals, ethnic groups | Africa | OLS |
| Nunn (2010) | Belief in Christianity | Colonial mission stations | Individuals, ethnic groups, villages | Africa | OLS |
| Nunn & Wantchekon (2011) | Trust | Slave trades | Individuals | Sub-Saharan Africa | IV |
| Okoye (2017) | Trust | 18th Century Christian missions | Individuals, ethnic groups | Nigeria | OLS |
| Olken (2009) | Social cohesion | Introduction of TV & Radio | Villages, individuals | Indonesia | OLS |
| Ramos-Toro (2019) | Prosociality, in-group bias, trust in medicine | Ancestors being kept in a leper colony | Individuals | Colombia | OLS |
| Rubin (2014) | Religious beliefs (Protestantism) | Early access to printing press | Cities | Europe | OLS |
| Rustagi (2019) | Conditional cooperation | Medieval democracy | Individuals, municipalities | Switzerland | OLS, IV |
| Schulz (2017), Schulz <i>et al</i> (2019) | Kinship ties | Catholic Church's medieval policies | Cities, regions, countries | Europe and Global | DD, OLS |
| Teso (2019) | Gender roles | Slave trades | Individuals, ethnic groups | Sub-Saharan Africa | OLS, IV |
| Xue (2018) | Gender roles | Cotton weaving | Counties | China | IV |

Notes: The statistical strategies list in the last column of the table include: natural experiments, instrumental variables (IV), regression discontinuity (RD), difference-in-difference estimates (DD), or randomized control trials (RCT). Natural experiments are cases where the determinant of interest occurs in locations or to individuals in an idiosyncratic manner that is close to randomly assigned. Instrumental variables is employed when one can find a variable (i.e., instrument) that is correlated with the determinant and only affects the outcome of interest through the determinant. In such cases, the instrument can be used to obtain a consistent causal estimate of the effect of the determinant on the outcome. Regression discontinuity can be employed when the treatment of interest has strict idiosyncratically determined borders delineating the treated group from untreated group. In such cases, differences in the outcome of interest can be compared at the boundary and this provide an unbiased causal estimate of the treatment of interest. Difference-in-difference estimates exploit variation in a treatment over time and estimates effects by looking at how the outcome changes for the treatment group relative to the control group after, relative to before, the treatment occurs. Another strategy is for the researcher to manipulate the implementation of a treatment of interest so that the implementation is done randomly (RCT). This allows the researcher to obtain causal estimates by comparing the randomly chosen treatment group to the randomly chosen control group. Lastly, OLS refers to ordinary least squares, which indicate that the study relies on evidence from conditional correlations.

Table 2: Manner of enslavement of Koelle’s informants.

| Manner of Enslavement | Percentage |
|--|------------|
| Taken in a war | 24.3% |
| Kidnapped or seized | 40.3% |
| Sold/tricked by a relative, friend, etc. | 19.4% |
| Through a judicial process | 16.0% |

Notes: The data are from Sigismund Koelle’s Linguistic Inventory. The sample consists of 144 informants interviewed by Koelle for which their means of enslavement is known.

description is from the Kong Kingdom, where Duarte Lopes, who was there from 1578–1583, described the situation as one where “as a result of the necessity, father sold son, and brother, both so that each person obtained food in any manner they could” (Heywood, 2009, p. 7).

In such an environment, where one had to be constantly on guard against being sold into slavery even with one’s friends and family, it is likely that distrust may have been beneficial and, thereby, spread. In other words, the slave trades may have led to a culture of distrust. Our analysis takes this hypothesis to the data, by constructing estimates from shipping records combined with a wide range of primary and secondary historical sources that report the ethnicity of over 100,000 individuals who were captured during the Atlantic and Indian Ocean slave trades. We construct ethnicity-level measures of the intensity of slave capture, which they use as a proxy for the extent to which an ethnic group experienced the slave trade. These are mapped and shown visually in Figure 2.

The ethnicity-level slave export data are combined with contemporary data from household surveys that report a respondent’s level of trust of those around them; namely their neighbors, family, co-ethnics, non-co-ethnics, and local government. We find strong evidence that the more an ethnic group was affected by the slave trades, the more they distrust those others today. Interestingly, the detrimental effects on trust of those close to an individual, such as family members, neighbors and coethincs appears to be stronger than the effect on those further from an individual such as non-coethnics.

In the analysis, we take special care to address the issue of causality. A concern is that groups that were less trusting initially were more likely to participate in the slave trade and that this low level of trust persists until today. If this were the case, then one would observe a relationship

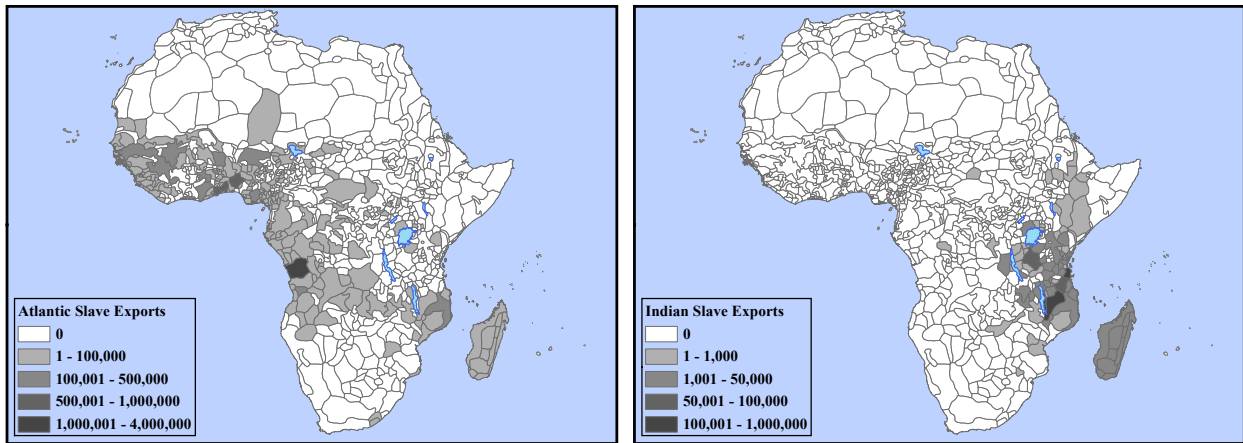


Figure 2: Map showing the number of slave taken from a location during the trans-Atlantic and Indian Ocean Slave trades.

between historical slave exports and trust today even if the slave trade had no causal effect on trust. To help understand whether the correlation we observe in the data is causal, we use a statistical strategy called instrumental variables. The strategy requires the use of a variable (or ‘instrument’) that affects slave exports but does not affect contemporary trust (or correlated with it in any way).

For this, we use the distance of the centroid of an ethnic group’s territory from the coast during the period of the slave trades. Since the demand for slaves was external, ethnic groups closer to the coast more intensively experienced the slave trade and tended to export more slaves. We find that the instrumental variable estimates confirm that the negative relationship between the slave trade and trust is causal.

One concern with the identification strategy is that distance from the coast could potentially have a direct effect on trust today. We check for this by conducting a falsification test. If one looks within Africa, one observes that ethnic groups further from the coast have higher levels of trust. This is because those further inland had smaller share of the population captured and exported and, therefore, higher levels of subsequent trust. If the distance from the coast matters for trust other than through the slave trade, then if we look outside of Africa, where the slave trades were not present one should also see a relationship. This is the logic of the ‘falsification test’. When we do this, we find no relationship between the distance from the coast and the slave trade. It is only the part of the world that experienced the slave trades where we observe a relationship between distance from the coast and trust.

The last part of the study attempts to test whether cultural evolution is the mechanism behind the estimated relationship between the slave trade and trust. It is possible that the slave trade adversely affected institutional and social structures. Therefore, respondents report trusting others less not because they are less trusting per se, but because others act in a less trustworthy manner because well-functioning institutions that constrain bad behavior are not present. We test for this alternative mechanism and find evidence that it is also present. We observe worse quality institutions and an effect of the slave trade on the trustworthiness of others where the slave trade was more intensive. However, when controlling for these factors, the effect of the slave trade on trust remains and is very similar in magnitude and statistical significance.

Several other studies have also examined other historical determinants of contemporary trust levels. Becker et al. (2016) use a regression-discontinuity identification strategy to examine the effects of the long-term effects of the Ottoman and Habsburg Empires on trust in local institutions. Comparing trust levels of individuals living in Eastern Europe near the former Ottoman-Habsburg border, they find that trust in the judicial system (i.e. the police force and courts) is higher in locations that were formerly Habsburg. This appears to be driven by lower levels of corruption in these systems today. To help address concerns of causality, the authors implement a regression discontinuity design, where the observations examined are restricted to lie within 200 kilometers of the former border, and observations are only compared if they lie within the same modern country (either Montenegro, Poland, Romania, Serbia or Ukraine). The strategy helps to ensure that the observations being compared are as similar as possible. An example within the African context is the study by Okoye (2017), which finds that Christian mission stations in Nigeria are associated with lower trust today.

Studies have also examined the determinants of trust in the Western medical system, which is an important contemporary policy issue, both in the developed and developing worlds. There is accumulating evidence that deficient medical policies in the past can have detrimental effects that continue to be felt today. Lowes and Montero (2017) find that colonial medical campaigns in French Equatorial Africa are associated with less trust in Western Medicine today, which results in lower vaccination rates and poor performance of foreign health interventions. Ramos-Toro (2019) shows that the decedents of patients forcibly confined to a Leper Colony that was in operation in Colombia from 1871–1950, report less trust in the medical system today. Alsan and Wanamaker (2018) study the Tuskegee experiments which were run by the United States Public Health Service

from 1932–1972. The study purposely left infected African American men untreated for syphilis to learn more about the life cycle of the disease. In return for their participation in the study (comprising medical exams, blood draws, spinal taps, and an autopsy), participants received hot meals and burial payments. The authors find that the experiment and its disclosure in a 1972 magazine article resulted in a decline in trust in the medical system among African American men. In turn, this distrust in the medical system, due to lower rates of utilization of medical facilities, has measurably worsened the health and lowered the life expectancy of this group.

Trust can be viewed as part of a larger set of ‘prosocial’ cultural traits that have been widely studied in the literature. Although there is some imprecision in the definition, such traits typically refer to behavior that may not be individually optimal but help others and are beneficial for the group or society as a whole. These are commonly measured using a range of experiments, including the dictator game, trust game, ultimatum game, and public goods game. Prosocial behavior has been correlated with a number of factors. A series of early papers showed that the average level of pro-sociality across societies, measured using behavioral experiments such as the ultimatum game or dictator game, is associated with the level of market development of a society (Henrich et al., 2001, 2005, 2010a). The authors hypothesize that the relationship exists because of the need to have norms of cooperation in exchange. Thus, a more interdependent society increases the benefit to prosocial norms, which in turn leads to a more complex market-oriented production structure.

Other studies have found that institutional development, a factor that we expect to coevolve with market development, also tends to have a positive effect on prosocial cultural traits. Guiso et al. (2008) study the long-term effects of self-governed Medieval city-states, which had more inclusive political systems, in Northern Italy and show that today these locations have higher levels of civic capital, as measured by blood donations, the presence of non-profit organizations, and cheating in school. Rustagi (2019) looks at Medieval self-governed cities in what today is Switzerland and shows that this historical institutional structure is associated with more conditional cooperation today, measured by play in public goods games and survey responses. Tabellini (2010) uses data on the extent of democracy across regions of Europe in the 19th Century and shows that this is highly predictive of prosocial traits like trust and respect for others, which are measured using survey questions from the *World Values Surveys*.

While the previous findings suggest that economic activity leads to greater prosociality, some

studies have also found that, surprisingly, conflict can have the same effect (Bauer et al., 2014, 2016). The studies implement behavioral games that measure prosociality, such as the dictator, ultimatum, and public goods games and survey questions that measure trust, prosociality, or civic participation. They find that all outcomes except for trust are positively correlated with a history of conflict. They also find that the effects on prosocial behavior in the experiments are only found when the game being played is with those from the same in-group (e.g., from the same village).

While these studies examine the shorter-run effects of conflict, the same relationships have also been found in the longer-run. Employing a regression-discontinuity identification strategy, Lowes and Montero (2019) examine the long-term effects of forced rubber collection in the Congo Free State. They find that the practice, which was violent and deadly, is associated with worse economic and institutional outcomes, such as income, education, infant mortality, access to public goods, and the quality of village chiefs and that it is also associated with more prosocial cultural traits today such as trust and sharing. The positive effects on prosocial cultural traits contrasts the findings from Nunn and Wantchekon (2011), who show that another form of violence – slave capture – had long-term detrimental effects on interpersonal trust. It is possible that the differences in the nature of the violence explains the different effects. With civil conflict and with the rubber concessions, the violence was typically perpetrated by those from outside of the community. It is possible that, as in Lowes and Montero (2019), the presence of an external enemy increases social cohesion within the community. By contrast, as Nunn and Wantchekon (2011) document, a sizeable proportion of slaves that were taken during the slave trade were captured by those within the community and very often by friends and even family members. This within-group violence may have had a very different effect and resulted in a deterioration of within-group cohesion. Consistent with this, Nunn and Wantchekon (2011) find larger adverse effects of the slave trade on the distrust of those close to the respondent, e.g., family and neighbors, than on the distrust of those more distant, such as non-coethnics.

Another set of cultural traits that have received significant attention in the literature is those associated with attitudes related to gender. A number of studies have shown how historical factors play an important role in shaping the wide variation in gender attitudes that we see today. In an early study along these lines, I tested a well-established hypothesis that was originally developed by Boserup (1970), about the agricultural origins of contemporary gender attitudes (Alesina et al., 2013). According to her hypothesis, in places with plow agriculture, because of

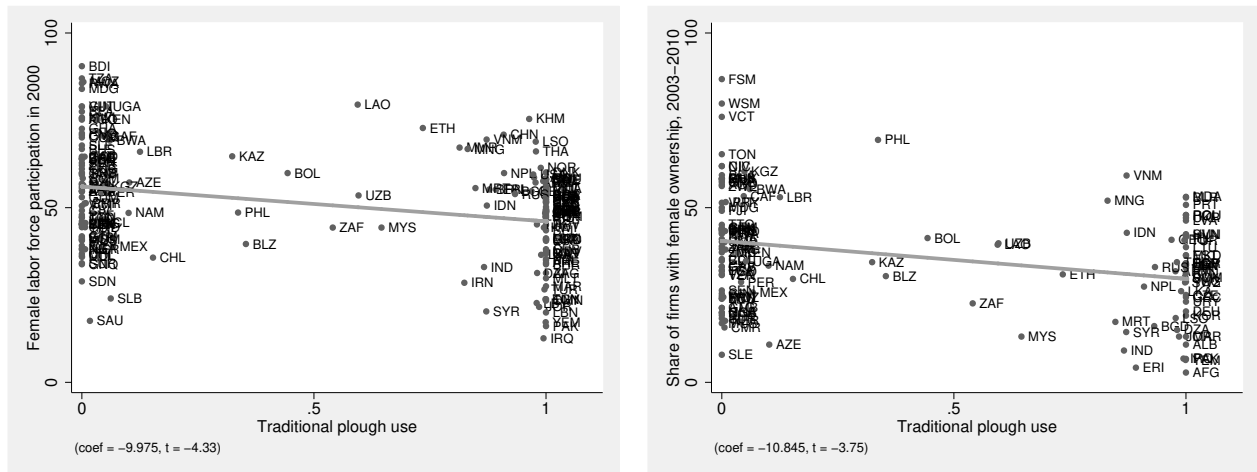


Figure 3: Graphs showing the relationship between traditional plow use and either female labor force participation (left) or female firm ownership (right).

the strength required to use the plow, men tended to work in the fields while women tended to work in the home only. By contrast, with forms of agriculture that did not use the plow, such as swidden or hoe agriculture, women actively participated in work outside the home. These patterns generated values and beliefs that supported the existing division of labor in society. plow societies tended to develop norms that women should not work outside the home, while in non-plow societies, such norms did not develop.

The first step we undertook was to look at ethnographic data from the *Ethnographic Atlas* to confirm that societies that used the plow in traditional agriculture did, indeed, have lower rates of female participation in agriculture. We then studied the effects of traditional plow use on gender equality today. This required matching ethnographic information from over 1,200 ethnic groups with information on the global distribution of over 7,000 languages and dialects spoke around the world today. This provided us information at a fine level of granularity about whether a society's ancestors traditionally engaged in plow agriculture. Looking across countries, districts and ethnic groups, we found that those with a traditional of plow use have lower rates of female labor force participation, a lower share of female politicians, less female entrepreneurship (measured by firm ownership) and less support for female employment outside the home in the contemporary period. While the analysis used incorporated a large set of covariates, for illustration, Figure 3 reports the raw cross-country correlations between ancestral plow use and both female labor force participation (left graph) and female firm ownership (right graph). As shown, even in the raw data, one observes a negative and statistically significant relationship.

To gain a better understanding of the causal effect of traditional plow use, we use instruments that affect whether the plow was adopted but are unlikely to directly affect contemporary female labor force participation through other channels. The instruments are based on the suitability of one's ancestral environment for cultivating different crops. Certain crops were particularly suitable for the adoption of the plow while others were not. The plow requires upfront investment but it allow a large amount of land to be cultivated during a short period of time. This is particularly beneficial for crops with a short growing season and that require a large amount of land to produce a given number of calories. The plow is also less beneficial for crops that can be grown on rocky, sloped, or swampy soils. Motivated by this, we use the average geo-climatic suitability of an ancestral location for the cultivation of three plow-positive crops (wheat, barley, and rye) and three plow-negative crops (sorghum, pearl millet ,and foxtail millet) as instrumental variables. We chose this specific set of crops because they are otherwise quite comparable, each being cereal crops from the Old World. The instrumental variable estimates confirm that the relationship between traditional plow use and gender norms about women's employment today is, in fact, causal.

Other studies have also found that other factors that affected the historical gender division of labor appear to matter for cultural values today. Xue (2018) documents the effect that the 17th-Century cotton revolution in China had on gender equality in China. Looking across counties, she finds that the prevalence of cotton weaving during the medieval period, which was the primary wage-earning occupation for women at the time, is associated with greater gender equality today, measured using the male-female sex ratio at birth.

Teso (2019) finds evidence that the gender imbalance caused by the trans-Atlantic Slave trade affected attitudes about gender roles today. The Atlantic slave trade, which was responsible for the enslavement and export of primarily male slaves, resulted in a shortage of men in many parts of the continent. As a result, women were forced into roles that were traditionally held by men, such as employment, political positions, and even warfare. The most well-known historical example of this is the female 'Amazon' army, which was established by Dahomey at the height of the slave trade in the 17th century and continued until the end of the 19th century. Teso (2019) shows that those parts of Africa that were the most impacted by the trans-Atlantic slave trade have higher rates of female labor force participation today. Interestingly, the same relationship is not found for the Indian Ocean slave trade, which shipped a more equal mix of men and women

overseas and therefore did not result in the same shortage of males.

Grosjean and Khattar (2018) study the consequence of another historical episode of gender imbalance: the early settlement of Australia. During the 18th and 19th Centuries larger numbers of male convicts were sent to Australia, resulting in severely male-biased sex ratios. Looking across Australia, the authors document that in localities with more male-biased sex ratios, women were less likely to participate in the labor force and were less likely to participate in high-ranking occupations. Today, these same places are more likely to have attitudes that reflect less gender equality between men and women. Female labor force participation is lower, particularly in high-ranking occupations. These findings dovetail nicely with those from Teso (2019). Both studies suggest gender imbalances that induced women into new roles (or prevented them from entering new roles) shaped attitudes and beliefs about the natural role of women in society, which persist and have effects long beyond the temporary episode of the sex imbalance. Because attitudes and beliefs shape the actual roles that women have in society, which in turn shape attitudes and beliefs about what is natural, these effects can be particularly stable and long-lasting.

Becker (2019) documents a relationship between a historical reliance on pastoralism and cultural practices that control women's sexuality like infibulation. Because pastoralism is associated with prolonged periods of absence of husbands from wives, there is the potential for infidelity. According to her hypothesis and supporting evidence, in response practices like infibulation developed, which served to control female sexuality by making sex more painful and less pleasurable. She also shows that, more generally, traditionally pastoral societies tend to have more restrictive norms and expectations about women's sexual freedom and to limit women's mobility and freedoms. Campa and Serafinelli (2019) provide compelling evidence that communism, by promoting the employment of women in the workplace, including in many sectors that would otherwise have been male-dominated like heavy manufacturing, created values and beliefs that reflect greater gender equality.

In this section, I have attempted to provide a sampling of the type of research studying the historical determinants of contemporary cultural variation. As you can see, this line of research typically combines historical data, often from primary archival sources, with contemporary measures of cultural traits, from surveys or experiments, often implemented by the researchers themselves, to test hypotheses of interest. While challenging given the historical nature of the analysis, the studies attempt to use empirical strategies that allow one to identify causal

relationships rather than correlations which can be biased due to reverse causality or omitted factors.

5. Shorter-run determinants

The findings reviewed in the previous section show that historical factors, even those in the distant past, can have effects that continue to be present today. Another line of research has begun to examine factors that affect culture but ones in the less distant past. This literature is summarized in Table 3, which has the same structure of Table 1 except that it summarizes the research of studies that estimate the more-immediate effects of the factors of interest; namely, effects that are felt within a person's lifetime rather than multiple generations into the future.

An important contribution of this line of research is to help understand the mechanisms behind the findings from the previous studies. While most of the studies of long-run determinants of culture do a good job of identifying convincing causal estimates of the historical factor, they tend to be less strong in identifying the exact mechanisms or paths of the effects being estimated. The empirical literature estimating shorter-run effects provides evidence on mechanisms that are helpful for understanding and interpreting the longer-term effects.

In thinking about mechanisms through which historical events affect outcomes today, one way is to partition them into vertical, horizontal, and oblique transmission. Several studies provide evidence for the importance of horizontal transmission (i.e., cultural transmission between individuals from the same generation). Two recent studies, Madestam and Yanagizawa-Drott (2011) and Madestam et al. (2013) examine the effects of an important avenue for horizontal transmission – i.e., socialization activities that involve groups of people. The first paper estimates the causal effects of participating in Fourth-of-July festivities as a child and adolescent, while the second paper looks at the causal effects of participating in Tea Party protests as an adult. Of course, estimating the effects of these activities is difficult since those who attend the protests likely have different cultural values to start with. In both studies, the authors make progress on this issue by exploiting the fact that the activities all occur outdoors. Thus, they exploit variation in whether it rains on the days of the activities to obtain exogenous variation in the extent to which people participate in them. Attendance at both Tea Party protests and Fourth-of-July festivities, such as fireworks, barbecues, and parades, are significantly lower (or even canceled) when it

Table 3: Overview of the economics literature on the shorter-term determinants of cultural traits.

| Study | Trait being explained | Determinant being tested | Unit of observation | Scope of sample | Statistical strategy |
|--------------------------------------|--|--|---------------------------|----------------------------------|----------------------------|
| Alesina & Fuchs-Schundeln (2007) | Changing preferences for government redistribution | Unification of Germany | Individuals | East and West Germany | Natural experiment, OLS |
| Bau (2019) | Differential child preference | Government pension | Individuals | Indonesia & Ghana | DD |
| Bauer <i>et al</i> (2014) | Prosociality & in-group bias | Civil conflict | Individuals | Rep. of Georgia and Sierra Leone | OLS |
| Beaman <i>et al</i> (2009) | Attitudes about women and politics | Reservation of position for women | Individuals | India | Natural experiment |
| Bentzen (2018) | Religiosity | Earthquakes | Individuals | Global | Natural experiment, DD |
| Bergh & Ohrvall (2019) | Trust | Movement to new country | Individuals | Swedish Expatriates | Natural experiment, OLS |
| Booth <i>et al</i> (forthcoming) | Competitiveness | Growing up under communism | Women | Beijing & Taipei | Natural experiment, DD |
| Burszryn <i>et al</i> (2018) | Attitudes about gender equality | Information provision | Men | Saudi Arabia | Randomized intervention |
| Campante & Yanagizawa-Drott (2015) | Religiosity & subjective well-being | Ramadan fasting | Individuals | Global | Natural experiment, DD |
| Cassar <i>et al</i> (2013) | Trust | Civil conflict | Individuals | Tajikistan | OLS |
| Cantoni <i>et al</i> (2017) | Political beliefs & attitudes | School curricula | Students | China | DD |
| Clingingsmith <i>et al</i> (2009) | Attitudes about gender equality | Hajj pilgrimage | Individuals | Global (all visa applicants) | Natural experiment |
| Della Vigna & Kaplan (2007) | Political preferences (voting) | Access to Fox News | Towns | United States | Natural experiment, DD |
| Depetris-Chauvin <i>et al</i> (2018) | National identity vs. coethnic identity | National soccer team victories | Individuals | Africa | RD, Natural experiment |
| Fernandez <i>et al</i> (2019) | Openness to homosexuality | AIDS epidemic | Individuals | United States | OLS, DD |
| Fouka (forthcoming) | Cultural assimilation | Language restrictions | Individuals | German immigrants in the U.S. | Natural experiment, DD |
| Francois <i>et al</i> (2010) | Trust | Firm competition | Workers, industries | United States | OLS |
| Francois <i>et al</i> (2018) | Trust | Banking deregulation, firm competition | Workers, industries | United States, Germany | OLS, DD |
| Giuliano & Spilimbergo (2014) | Luck vs. effort, preferences for redistribution | Childhood recession | Individuals | United States & 37 Countries | DD |
| Henrich <i>et al</i> (2019) | Religiosity | War | Individuals | Uganda, Sierra Leone, Tajikistan | OLS |
| Jakiela & Ozier (2016) | Exposure to election violence | Risk aversion | Individuals | Kenya | Natural experiment, DD, IV |
| Jensen & Oster (2009) | Gender norms, female empowerment | Cable & satellite television | Villages | India | DD |
| Kosse <i>et al</i> (forthcoming) | Altruism, trust, & other-regarding behavior | Mentor program | Children | Germany | RCT |
| La Ferrara <i>et al</i> (2012) | Norms about fertility | Television soap operas | Women | Brazil | Natural experiment, DD |
| Madestam <i>et al</i> (2011) | Political preferences | Fourth of July festivities | Individuals | United States | Natural experiment, DD |
| Madestam <i>et al</i> (2013) | Political preferences | Tea Party protests | Counties | United States | Natural experiment, DD |
| Mitrunen (2019) | Assimilation & patriotism | Compulsory patriotic acts in schools | Children | United States | Natural experiment, OLS |
| Qian (2008) | Gender bias (sex imbalance) | Female income | Individuals | China | DD |
| Rao (2019) | Altruism toward outgroup | School integration policies | Children | Private schools in Delhi, India | Natural experiment, DD |
| Riley (2017) | Educational success | Watching inspirational movie | Secondary school students | Schools in Uganda | Randomized intervention |

Notes: The statistical strategies list in the last column of the table include: natural experiments, instrumental variables (IV), regression discontinuity (RD), difference-in-difference estimates (DD), or randomized control trials (RCT). Natural experiments are cases where the determinant of interest occurs in locations or to individuals in an idiosyncratic manner that is close to randomly assigned. Instrumental variables is employed when one can find a variable (i.e., instrument) that is correlated with the determinant and only affects the outcome of interest through the determinant. In such cases, the instrument can be used to obtain a consistent causal estimate of the effect of the determinant on the outcome. Regression discontinuity can be employed when the treatment of interest has strict idiosyncratically determined borders delineating the treated group from untreated group. In such cases, differences in the outcome of interest can be compared at the boundary and this provide an unbiased causal estimate of the treatment of interest. Difference-in-difference estimates exploit variation in a treatment over time and estimates effects by looking at how the outcome changes for the treatment group relative to the control group after, relative to before, the treatment occurs. Another strategy is for the researcher to manipulate the implementation of a treatment of interest so that the implementation is done randomly (RCT). This allows the researcher to obtain causal estimates by comparing the randomly chosen treatment group to the randomly chosen control group. Lastly, OLS refers to ordinary least squares, which indicate that the study relies on evidence from conditional correlations.

rains. Exploiting this source of ‘exogenous variation,’ both studies find strong evidence that the socialization activities have important effects. Participation in Tea Party protests is found to move one’s political orientation further towards the right. More surprisingly, the same effect is found for Fourth-of-July festivities. Participating in these activities as a child is associated with more conservative political views (and more conservative voting) as an adult. In addition to the specific findings of the paper, an important take-away is that socialization activities, like festivals, protests, and holidays, can have important effects.

In a very different setting and using a different empirical strategy to obtain causal effects, Clingingsmith et al. (2009) also find evidence that socialization can affect culture. They estimate the effects of the Hajj – an annual pilgrimage to Mecca made by Muslims – on the values of beliefs of participants. The students exploit the fact that, in Pakistan, participation (namely, travel visas) is limited and allocated randomly by lottery. The authors examine the sample of all applicants comparing those that were randomly selected to those that were not. They find that participation in the Hajj increased religiosity and one’s feeling of unity with fellow Muslims, while decreasing perceived differences or inequalities between groups within Islam. It also increased attitudes about gender equality and female empowerment. This is expected since the Pakistani population

being studied is much more conservative on this dimension than the modal participant of the Hajj. Thus, attitudes about gender appear to have converged closer to the modal Islamic view after the Hajj. This is likely due to Pakistani participants meeting other Muslims with more liberal gender attitudes than their own.

One of the important findings from Clingingsmith et al. (2009) is that the Hajj can increase group identity and cohesion. Depetris-Chauvin et al. (2020) find that, remarkably, soccer has similar effects. Looking at populations within Africa, they compare people's self-reported attitudes before and after international professional soccer matches in which their national team won and lost. They find that victories increase the extent to which respondents identify with their country and decrease the extent to which they identify with their ethnic group. Thus, this form of shared experience does appear to be important for building a national identity, at least in this particular setting.

Others have studied horizontal transmission that occurs through the media, such as television, and found that this can have sizeable and important effects. Della Vigna and Kaplan (2007) exploit the staggered introduction of Fox News, using a difference-in-differences estimation strategy, and find that exposure to the cable news station had large effects on the Republican vote shares in Presidential and national Senate elections. According to their best estimates, Fox News was able to change the political views of between 3 and 28 percent of its viewers (depending on the specification), convincing them to vote Republican. Similarly, large effects from media are also found by La Ferrara et al. (2012) who rely on a similar identification strategy but for Brazilian soap operas (called *novelas*) produced by a company named Rede Globo. They find evidence that the novelas, which tend to feature smaller families in their stories, affected norms about desired family size and reduced rates of fertility. Most recently, Cornelson (2018) finds evidence that *The Cosby Show*, which was one of the first prime-time sitcoms to feature an educated upper-middle-class African-American family, changed attitudes towards education, and actual educational attainment, among African Americans. Since the popularity of the Cosby show is potentially endogenous to pre-existing values, the author uses whether a city's NBA regularly had games at the same time as the show as an instrument. The assumption is that this does not have a direct effect on attitudes, but only affects them by reducing the frequency of Cosby Show viewing. The study also finds that the educational effects of the Cosby Show are only found for African Americans and not for those who were white.

Studies have also found evidence for the importance of vertical transmission. Campante and Yanagizawa-Drott (2016) examine the effects of a father's military experience on his son's attitudes. The authors obtain quasi-exogenous variation in the extent to which American fathers served in the military from the fact that one's likelihood of participating in war depends on one's age at the time of the war. They show that the probability is maximized for those 21 years old at the time of war and decreases as one moves away from this age (either older or younger). They find that there appears to be a form of vertical transmission. They find evidence that a father's wartime service affects the values and beliefs of their sons, making them more likely to also serve during wartime. Another example of a study that shows a similar form of vertical transmission is Fernandez et al. (2004) who examine the intergenerational transmission of attitudes about gender roles. They exploit variation in female employment arising from World War II and show that if a man's mother was employed while he was growing up, then his wife is also more likely to work.

These findings complement those from several studies that examine the behavior of second-generation immigrants to the United States and Europe. They find that these individuals who are born and raised in the United States but with parents born in a different country exhibit behavior that reflects their origin country. Evidence for vertical transmission has been put forth for a range of cultural traits, including trust (Algan and Cahuc, 2010), gender roles (Fernandez and Fogli, 2009), family living arrangements (Giuliano, 2007), thrift (Costa-Font and an Berkay Ozcan, 2018), and endogamy (Giuliano and Nunn, 2020).

6. Cultural persistence and change

The empirical evidence reviewed to this point makes clear that cultural traits are malleable and that they evolve in systematic and predictable ways. They are shaped by historical forces and evolve through time. What is less clear is how quickly or how easily a society's culture can change. One of the few studies to touch on these questions directly is Alesina and Fuchs-Schundeln's (2007) study of the speed of cultural convergence following the reunification of East and West Germany. Using survey data, Alesina and Fuchs-Schundeln document that following reunification, former East Germans remain more supportive of government policies that redistribute income than former West Germans. However, over time, the difference has been declining. According to their estimates, at the current rate, the differences will disappear within 40 years.

Another strategy that has been undertaken to examine the persistence and decay of culture is to compare the culture of immigrants and their offspring (e.g., Giuliano, 2007, Fernandez and Fogli, 2009, Algan and Cahuc, 2010). Immigration provides a 'natural experiment' where one can examine the extent of cultural persistence and change in a setting that features a significant change in the external environment, including the dominant social norms. Studies have looked at a range of cultural outcomes, including attitudes about gender roles, fertility, living arrangements, endogamy, and trust. They have consistently found that there is a persistence of these values even after multiple generations in the new locations. For example, it is found that individuals who are born and raised in the United States or Europe, but have parents and/or grandparents who were born in a foreign country, have values and behaviors that resemble those from their ancestral country. Although the continuity of the culture of one's ancestors is by no means perfect (there is decay), it is estimated to be remarkably strong. Algan and Cahuc (2010) study trust among fourth-generation immigrants to the United States and show that even for this group, whose parents and grandparents but not great grandparents were born in the United States, the variation in trust closely reflects the level of trust in the origin country of the great grandparents. Thus, even after three generations in the United States, the cultural residue of the origin country remains.

Recent research has turned to the question of whether cultural persistence differs depending on the particular cultural trait being examined. Giavazzi et al. (2019) examine the persistence of a range of different cultural traits among immigrants and their descendants using the U.S. *General Social Survey*. Their analysis, which studies Mexicans and six different European groups (British, German, Irish, Italian, Polish, and Scandinavian), finds that the degree of cultural persistence varies significantly for different cultural traits. Values related to prosociality (e.g., trustworthiness, helpfulness, fairness towards others, etc.) tend to be the least persistent. For these traits, the values held by immigrants and their descendants quickly converge to those of the destination location. By contrast, values related to politics, religion, and morality (e.g., the role of government, sexual behavior, abortion, etc) appear to be much more persistent. They also find that attitudes about family and gender (e.g., female employment, women in politics, the obedience of children, divorce, etc.) occupy an intermediate position.

In recent research, I have tried to better understand the factors that determine the extent to which a society has cultural traits and cultural traditions that are more fluid and less fixed. In a

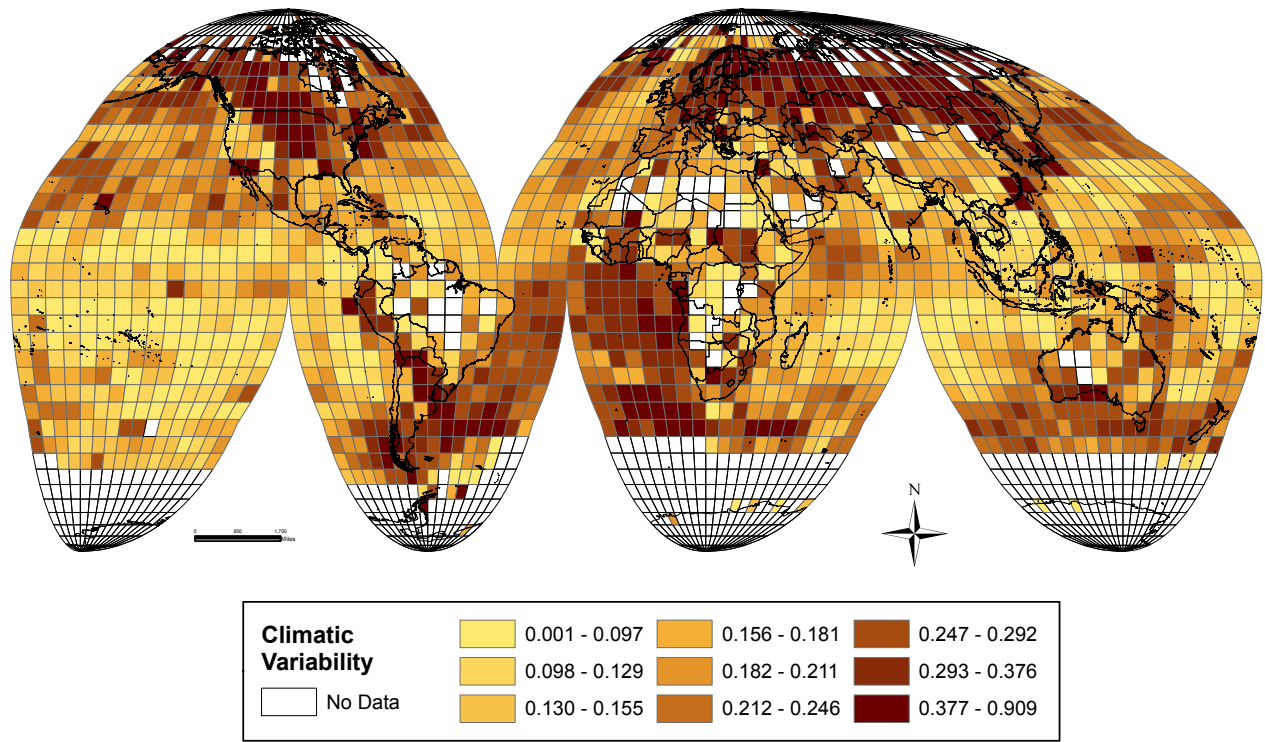
recent paper with Paola Giuliano, we test a core prediction that arises from evolutionary models of culture (such as those discussed in section 2): that an environment that is stable (or similar) from one generation to the next results in society placing more importance in upholding the traditions of previous generations, which results in more cultural persistence and less cultural change (Giuliano and Nunn, 2020). In stable settings, the evolved traditions are particularly relevant and beneficial for the current generation. In settings where the environment differs significantly between generations, evolved traditions may have been beneficial in the previous setting but not in the current one.

To test this, we use paleoclimatic data, which is available starting in 500AD, to create measures of how variable the climate was between generations historically.⁴ Such data are available at a 5-degree grid-cell level globally and at a 0.5-degree level for North America. The instability measures that we construct are shown in Figure 4.

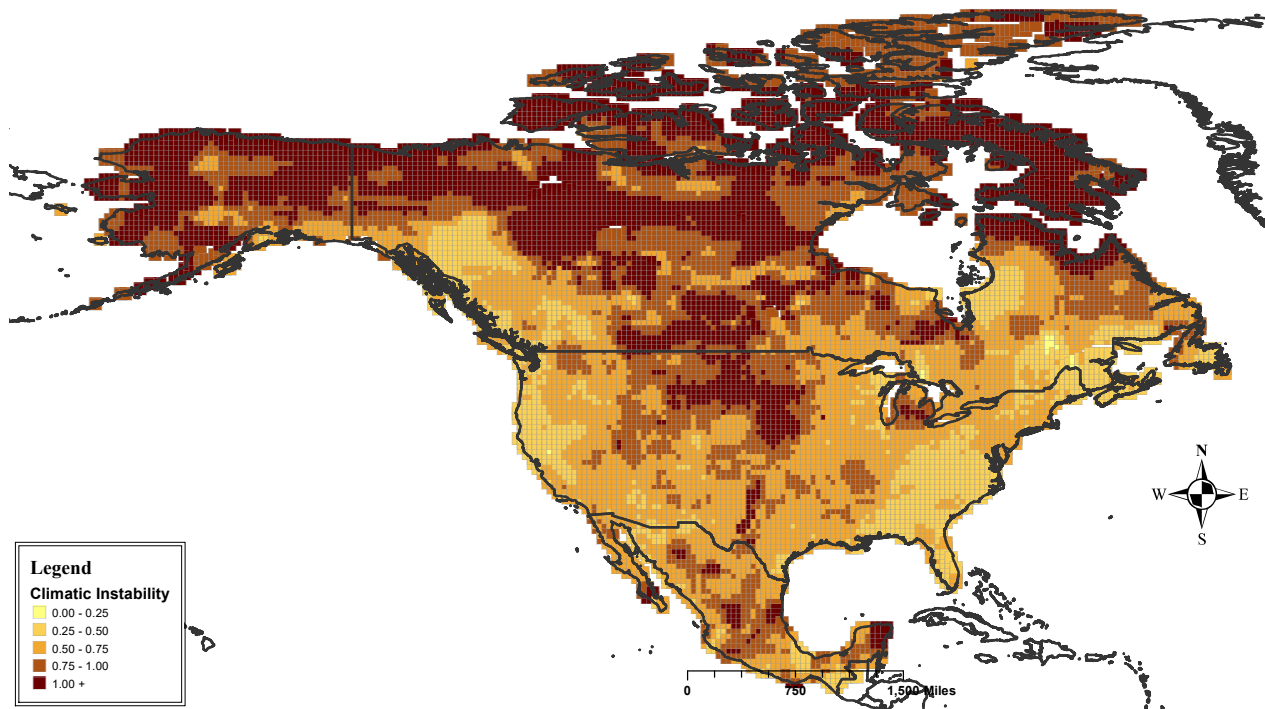
We then combine these data with information on the historical location of ethnic groups in the pre-industrial period taken from various ethnographic sources. This provides a measure of the cross-generational climatic instability of the ancestors of individuals alive today. We then test for the importance of tradition and cultural persistence by linking individuals observed today with ancestral groups in the past using language, ethnicity, or location of birth, depending on data availability. The analysis undertakes a series of tests which all yield the same conclusion: instability of the environment across previous generations is associated with less importance placed on tradition and less cultural persistence today. We look globally at survey data that reports the strength of a person's beliefs about the importance of following a society's pre-existing traditions and customs. The raw bivariate relationship between the average strength of this view in a country and ancestral climatic instability is shown in Figure 5a, which is taken from Giuliano and Nunn (2020).

We also use immigrants to the United States as a natural experiment that can be used to study the persistence of tradition. We study the children of immigrants, born and raised in the same locations in the United States but from different cultural backgrounds, and examine the extent to which they continue the traditions of their home country. We find that second-generation immigrants are less likely to marry within their own group or speak their ancestral language at

⁴Specifically, we calculate the mean of the climate measure for each 20-year generation and then calculate the standard deviation of this across generations.

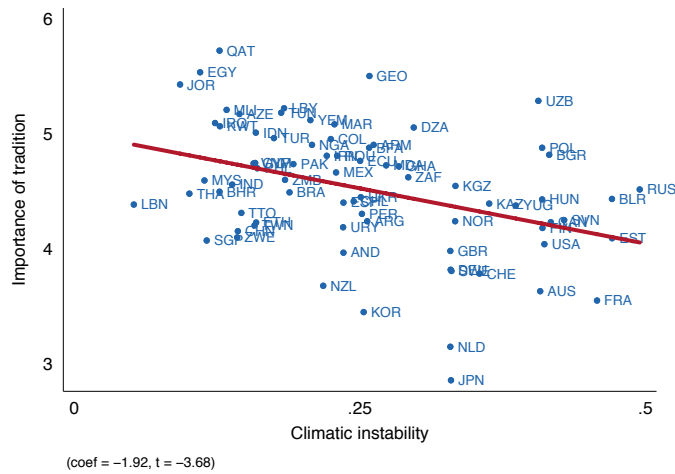


(a) Measure using the global sample (temperature anomalies)

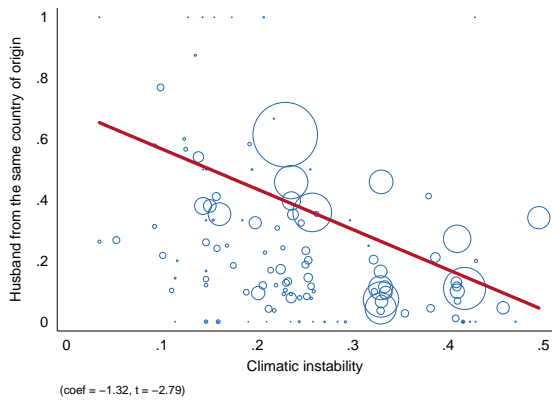


(b) Measure using the North American sample (drought severity index)

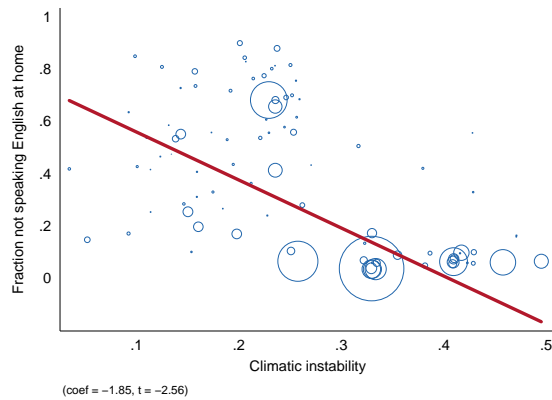
Figure 4: Grid-cell-level measures of the instability of the climate across previous generations, 500–1900.



(a) The bivariate cross-country relationship between average instability of the climate across previous generations and the average self-reported importance of tradition today



(b) Bivariate relationship between women marrying men from their country of origin and cross-generational climatic instability



(c) Bivariate relationship between speaking a foreign language at home and cross-generational climatic instability

Figure 5: Figures from Giuliano and Nunn (2020).

home if they are from a country where the ancestors of the country lived in an environment that was more unstable across generations. The relationships are shown in Figures 5b and 5c, which report bivariate correlations at the origin-country level. Both figures are taken from Giuliano and Nunn (2020). Another strategy that we undertake is to study indigenous populations living in the United States and Canada and whether they continue to speak their traditional language. We find that indigenous populations with ancestors who lived in a more variable environment are less likely to know how to speak their traditional language today.

The importance placed on tradition has been studied extensively by Economic Historian Joel Mokyr (2018) in his book *Culture of Growth*. In it, he argues that a crucial determinant of the

18th Century Industrial Revolution in Western Europe was the new belief that it was acceptable for new generations to question the wisdom of the previous generations – i.e., the “ancients”. This combined with a resulting cultural belief that it is possible and desirable to understand how the natural world works, led to innovation and knowledge creation which ultimately created the economic productivity gains of the Industrial Revolution. Mokyr (2018) argues that the presence of this new cultural trait – a weakening of the importance placed on traditional ways of thinking – was present in Western Europe but not China, which explains why, despite similar levels of economic development, the Industrial Revolution did not occur in China. He argues that “the heavy hand of the respect for the ‘ancients’ was felt through much of Chinese history” (p. 298). According to this argument, a weakening of tradition, and the resulting cultural change, are key determinants of the Industrial Revolution and the World’s current economic prosperity.

7. Economic consequences of cultural differences

One line of inquiry that is of particular importance to the cultural economics literature is the economic consequences of cross-cultural differences in the world today. The traditional and mainstream view within economics has been that cultural differences may exist, but they are unlikely to affect anything that economists care about. This was often used as a defense by some to justify the field’s traditional neglect of culture. However, a growing body of recent research has sought to test whether cultural differences appear to affect economic outcomes. The answer provided by this line of research is a clear ‘yes’. Cultural factors explain a host of outcomes that are squarely important to economists, like trade, foreign direct investment, innovation, savings, investment, and economic growth. A sampling of the key studies from this body of research is provided in Table 4.⁵

One of the first and most widely traits to be studied is interpersonal trust, which has long been recognized by economists as being a foundation for economic exchange (e.g. Arrow, 1972). Guiso et al. (2009) consider the effect that trust has on exchange in the international context. They are interested in whether the average level of trust of one country towards another affects trade between the two. They measure the trust of one country towards another using measures from the *Eurobarometer* surveys, which ask about bilateral trust between members of the European Union.

⁵For a review of the early literature documenting the economic consequences of culture see Guiso et al. (2006).

Table 4: Overview of the economics literature on the consequences of differences in cultural traits.

| Study | Outcome being affected | Trait being examined | Unit of observation | Scope of sample | Statistical strategy |
|-------------------------------------|---|---------------------------------------|----------------------------|------------------------------|-------------------------|
| Aghion <i>et al.</i> (2010) | Government regulation | Distrust | Individuals, countries | Global | OLS |
| Algan & Cahuc (2010) | Economic growth | Generalized trust | Individuals, countries | Global | Natural experiment, IV |
| Ashraf <i>et al.</i> (forthcoming) | Education | Bride price | Individuals, ethnic groups | Indonesia & Zambia | OLS, DD |
| Atkin (2016) | Malnutrition | Food preferences | Households | India | Natural experiment, OLS |
| Becker & Woessmann (2008) | Female education, gender gap | Religious beliefs (Protestantism) | Counties | Prussia | OLS, IV |
| Becker & Woessmann (2009) | Education & economic growth | Religious beliefs (Protestantism) | Counties | Prussia | OLS, IV |
| Butler <i>et al.</i> (2016) | Income | Generalized trust | Individuals | Global | OLS |
| Campante & Chor (2017) | Industrial specialization of production | Workplace obedience | Countries & industries | Global | OLS, DD |
| Campante & Yanagizawa-Drott (2015) | Happiness, economic output | Religiosity due to fasting | Individuals, countries | Islamic countries | Natural experiment |
| Corno <i>et al.</i> (forthcoming) | Early marriage and fertility differences due to drought | Bride price or dowry | Women | Sub-Saharan Africa and India | OLS |
| Dohmen <i>et al.</i> (2018) | Capital accumulation & economic growth | Patience | Countries | Global | OLS |
| Enke (2019) | Voting in U.S. Presidential elections | Universal vs. group-based morality | Counties | United States | OLS |
| Enke (2019) | Economic growth | Kinship tightness, universal morality | Ethnic groups, countries | Global | OLS |
| Enke <i>et al.</i> (2019) | Political preferences | Universal vs. group-based morality | Individuals, countries | United States and Europe | OLS |
| Figlio <i>et al.</i> (forthcoming) | Educational performance | Long-term orientation | Immigrant students in U.S. | Global | OLS |
| Gorodnichenko & Roland (2011, 2017) | Economic growth | Individualism vs. collectivism | Countries | Global | OLS, IV |
| Gorodnichenko & Roland (2015) | Autocratic vs. democratic national government | Individualism vs. collectivism | Countries | Global | OLS, IV |
| Gorodnichenko <i>et al.</i> (2018) | Foreign outsourcing vs. foreign direct investment | Cultural difference between countries | Country pairs | Global | OLS, DD |
| Guiso <i>et al.</i> (2009) | Bilateral trade & foreign direct investment | Trust between countries | Countries | European countries | OLS |
| Jayachandran & Pande (2017) | Childhood stunting | Son preference | Children | India & Africa | OLS |
| Lowes (2018) | Household cooperation, female and child wellbeing | Matrilineal kinship | Individuals, ethnic groups | Dem. Republic of the Congo | RD, OLS |
| Moscona <i>et al.</i> (2019) | Conflict | Segmentary lineage systems | Ethnic groups, grid cells | Africa | OLS, RD |
| Nunn <i>et al.</i> (2019) | Political turnover | Generalized trust | Countries, U.S. counties | Global & United States | DD |
| Nguyen (2018) | Innovation | Interpersonal trust | CEOs, workers, companies | United States | OLS |

Notes: The statistical strategies list in the last column of the table include: natural experiments, instrumental variables (IV), regression discontinuity (RD), difference-in-difference estimates (DD), or randomized control trials (RCT). Natural experiments are cases where the determinant of interest occurs in locations or to individuals in an idiosyncratic manner that is close to randomly assigned. Instrumental variables is employed when one can find a variable (i.e., instrument) that is correlated with the determinant and only affects the outcome of interest through the determinant. In such cases, the instrument can be used to obtain a consistent causal estimate of the effect of the determinant on the outcome. Regression discontinuity can be employed when the treatment of interest has strict idiosyncratically determined borders delineating the treated group from untreated group. In such cases, differences in the outcome of interest can be compared at the boundary and this provide an unbiased causal estimate of the treatment of interest. Difference-in-difference estimates exploit variation in a treatment over time and estimates effects by looking at how the outcome changes for the treatment group relative to the control group after, relative to before, the treatment occurs. Another strategy is for the researcher to manipulate the implementation of a treatment of interest so that the implementation is done randomly (RCT). This allows the researcher to obtain causal estimates by comparing the randomly chosen treatment group to the randomly chosen control group. Lastly, OLS refers to ordinary least squares, which indicate that the study relies on evidence from conditional correlations.

The authors show that these measures of bilateral trust are remarkably strong predictors of the amount of trade between two countries. If a country trusts another country more, then imports from that country are higher. While the authors are not able to pin down the exact channels, an important channel may be that importing requires trust that the reported quality and longevity of the product is what the exporter promises. Since a product's quality may not be revealed for many years into the future, some amount of trust is required at the time of purchase. Consistent with this, they find that trust matters more for products that are more complex and sophisticated, such as consumer electronics, and less for standardized products and commodities, like potatoes or steel, for which the quality and other attributes are more easily verifiable. They also find a similar relationship for foreign direct investment. If a country's level of trust of another country is higher, then foreign investment into that country is also higher. This likely reflects the fact that investing in a country not only requires trust in the local business environment or government, but also trust that people will not take advantage of you once your investments in the location have been made. Overall, the findings of Guiso et al. (2009) provide clear evidence that, at least internationally, trust does facilitate economic activity.

Given that trust affects economic exchange, the natural next question is whether it affects overall economic development. This question was tackled by Algan and Cahuc (2010), who find

that, indeed, countries with greater trust also have higher levels of economic development. This is consistent with expectations since a sufficient amount of trust is needed to conduct business, especially in the modern economy. A concern with such a relationship is that the causality could be reversed. It might be easier for those in rich countries to trust each other than those in poor countries. The study addresses this by measuring the trust of those from different backgrounds but in the same external environment. In this way, one can be more confident that the measure of trust truly captures the cultural component and not the part of the variable that is affected by external factors like wealth, laws, institutions, etc. They do this by looking at individuals born and raised in the United States but with parents (or grandparents) who were born in a foreign country. Conditioning on a host of observable characteristics, this can then be used to provide a measure of the inherent culture of trust of individuals from a particular country that is purged of the direct effects that the country's characteristics have on the measure. Undertaking this procedure, the authors find that trust does indeed have a sizeable and significant effect on economic performance. Countries with a higher level of generalized trust are richer.

While the research of Algan and Cahuc (2010) focuses on the relationship between trust and economic well-being at the country-level, a related and interesting question is whether the relationship is similar at the individual level as well. One difference is that across individuals, one can imagine that if someone is too trusting, then they may be too gullible and cheated. In other words, one might have too much trust. This suggests that the optimal level of trust might take on an intermediate value. Too much trust is not good and too little trust is not good. A study by Butler et al. (2016) examines individual-level data from the *World Values Surveys* and show that, consistent with this, the relationship between trust and income is non-monotonic and hump-shaped. Trust that is too low is associated with low income, but trust that is too high is also associated with low income. Thus, at the group-level (e.g., countries) incomes appears to be monotonically increasing in the level of trust. However, at the individual level, at low and moderate levels of incomes, more trust is associated with higher income. However, for those at higher levels of income greater trust is associated with lower income. This difference is interesting and suggests that the highest levels of trust may not be individually beneficial, although they are beneficial for the group as a whole.

Nguyen (2018) also looks at the effects of trust at the individual level, but in a very specific context; the trust of CEO's in the largest public firms in the United States. She is interested in

how variation in the trust of CEOs, arising from differences in ancestry, affects innovative activity within the firm. She hypothesizes that when a CEO has higher levels of trust in its R&D staff, then they will be more willing to take risks, which results in more innovation. Her analysis, which studies 5,743 CEOs, 3,598 firms, and over 700,000 patents, looks within firms that have changes in CEOs to identify the effect of CEO trust on innovative activity. She measures CEOs' trust by using their surname to impute ancestry for which we have measures of average trust. She finds that the generalized trust of CEOs is positively correlated with innovative activity. A one-standard-deviation increase in CEO generalized trust is associated with 6% more patents in the firm annually. The study then pushes the analysis further by studying whether bilateral measures of trust (i.e., the trust of one group towards another), which are available from Guiso et al. (2009), predict inventor performance. That is, if the ancestry of the CEO has a high level of trust of inventors of a certain background, do those inventors perform better. She finds that even when looking at these bilateral measures of trust, higher trust is associated with more innovation.

Another cultural trait that has been examined in the economic literature is the distinction between collectivism/individualism (Nisbett, 2003). In a series of papers, Gerard Roland and Yuriy Gorodnichenko document that more individualistic countries, measured using data from Hofstede (2001), have more innovation and higher levels of income today (Gorodnichenko and Roland, 2011, 2017). They argue that this is because those from individualistic societies tend to place more importance on individual achievement and individual status, which results in higher rates of technological innovation which fuels economic growth.

While it is true that today countries that are more individualistic are richer, this has not always been the case. Enke (2019a) shows that countries that are more individualistic, which he measures using weak of kinship ties, were not significantly wealthier until after 1700. At the time of the industrial revolution, societies that were more individualistic began to experience faster economic growth. The fact that this occurs during the industrial revolution is consistent with Roland and Gorodnichenko's evidence showing that innovation is an important mechanism.

While all of the studies examined so far have focused on the economic consequences of cultural traits, recent studies have turned to the question of whether such traits also matter for politics. For example, in a recent study with Nancy Qian and Jaya Wen, we study the political consequences of differences in generalized trust (Nunn et al., 2019). Looking at the experience of countries in the post-WWII period, we find that generalized trust is an important moderating cultural trait

that determines the extent to which national leaders are voted out of office when an economic recession occurs. The statistical analysis examines the determinants of leader turnover using annual data and in a (difference-in-differences) specification that includes country fixed effects and year fixed effects. The key determinant of interest is an interaction between the average level of generalized trust in a country and whether the country experienced an economic recession in the previous year. While recessions lead to a higher probability that leader turnover will occur, this effect is lower if a country has a higher level of trust. We interpret the finding as due to a society's greater proclivity to believe politicians when they argue that the economic situation is despite their best efforts rather than due to their mistakes. We find these effects are present in countries that have established and regular elections but not in those that do not, this is consistent with politicians being more accountable and more influenced by public opinion in democratic systems than in autocratic regimes. To gain a deeper understanding of the validity of this finding, we also check for the same effect within the United States for Presidential elections. The findings here are the same: counties with a higher level of trust are more likely to vote for the incumbent party in the face of a recession.

Another example is Gorodnichenko and Roland (2015) who document that more individualistic countries are more likely to have been democratic between 1980 and 2010. The authors develop a model that shows how such a relationship can emerge if one assumes that collectivist societies are more prone to conformity and have a greater aversion to institutional change. Consistent with this, recent studies find that societies with a greater prevalence of cousin marriage today, which is strongly associated with collectivism (Schulz et al., 2019), tend to have less-democratic governance structures (Schulz, 2017) and more corruption (Akbari et al., 2019).

A trait that has been shown to be closely related to the individualism/collectivism distinction is how universal one's morality is (Enke, 2019a). In some societies, morality (e.g., altruism, loyalty, allegiance, etc.) is only extended to a limited group (e.g., the lineage, clan, or the village). Here it is viewed as normal and correct to treat in-group and out-group members differently. In these societies, which tend to be classified as collectivist, morality is group-specific or limited. In other societies, the belief is closer to the view that all individuals should be treated the same regardless of how distant they are from you. Here, morality is more universal. As shown by (Enke, 2019a), these societies tend to be more individualistic, where the rights of individuals are placed before the rights of the group. Thus, collectivist societies tend to have a more limited group-based

morality, while individualistic societies tend to have a more universal morality.

Building on the distinction between group-based and universal morality, Enke (2019b) studies its importance for political preferences. He studies the 2016 Presidential election and shows that the most important determinant of the election (and previous presidential elections as well) was the extent of morality. He uses text analysis to examine campaign speeches and shows that of all candidates since WWII, Donald Trump's speeches exhibited values that were the least universal and most group-specific. By contrast, Hillary Clinton's speeches exhibited values that were the most universal and least group-specific relative to all politicians since WWII. Thus, the two were on polar opposite sides of the spectrum. Using survey data, he then quantifies the extent to which the average values in a county are universal or not and shows that counties with less universal values were much more likely to vote for Donald Trump than for Hillary Clinton. He then extends his analysis to all presidential candidates since WWII and shows that this pattern holds more generally. Thus, the extent to which an individual's morality is group-based (rather than universal) appears to be an important determinant of voting during past Presidential elections.

The last set of studies that I discuss examines the consequences of traditional customs, which can be seen as a consequence of sets of norms that arise from underlying cultural values, beliefs, and morals. The economic consequences of traditional customs, like kinship practices, marriage customs, food customs, or gender preferences, have recently been examined. For example, in a recent study that I have undertaken with Jacob Moscona and James Robinson, we find that segmentary lineage organization is associated with greater conflict and civil war in sub-Saharan Africa (Moscona et al., 2019). Segmentary lineages are an organizational form, where the economic and political structure of the society is grouped into nested segments, where one's position within the lineage dictates one's rights, obligations, and responsibilities. A defining characteristic of segmentary lineage groups is the presence of the strong obligations to come to the defense of one's lineage mates in times of conflict. It has been hypothesized that this characteristic results in a great capacity to mobilize fighters for war and therefore generates larger and more frequent conflicts (Evans-Pritchard, 1940, Sahlins, 1961). Our research finds that segmentary lineage organization is an important factor explaining the intensity of conflict – including civil wars – within Africa in the modern period.

Other traditional customs have also been studied. Recent studies have found that matrilineal kinship is associated with less household cooperation but more educated and healthier children

(Lowes, 2018); male child preference explains much of the prevalence of child stunting in India (Jayachandran and Pande, 2017); food cultures explains an important portion of malnutrition among migrants within India (Atkin, 2016); and differences in marriage payments is an important determinant of differences in girls' educational attainment and age of marriage (Ashraf et al., 2020, Corno et al., 2019).

8. The interplay of culture and policy

With much of the profession now understanding the importance of culture for economic outcomes, research has now turned to the natural question of how these insights apply to economic policy. A number of recent studies have attempted to make progress on better understanding of how accounting for the culture can help us design better economic policies.

Lowes and Montero (2017) study the long-term consequences of medical interventions that occurred during the colonial period in French Equatorial Africa. They were aimed at eradicating sleeping sickness (trypanosomiasis). The campaigns required villagers, often at gunpoint, to submit to physical exams and tests for sleeping sickness. The only effective test at the time was a spinal tap, an extremely painful procedure. Given this, it was often easier to simply treat whole villages, rather than only those with the disease. The early treatment used was an arsenic-based drug called atoxyl, which, it was later discovered, had the side effect of causing at least partial blindness in approximately 20% of those treated. The parents, grandparents, and great grandparents of those alive today directly experienced the medical interventions, which continued regularly until the end of colonial rule. Stories are told and songs sung of these traumatic historical experiences.

The authors are interested in testing whether these historical experiences and others like them, which occurred throughout the continent, could explain why populations in Africa often refuse or are suspicious of Western medicine. To test the hypothesis, the authors digitize archival documents that reported the frequency with which different locations within French Equatorial Africa were visited by the colonial medical campaigns. With this information, they compare how the historical experience with colonial medical campaigns is associated with the success of contemporary foreign medical interventions. They find that places with more visits in the past have medical interventions that are less successful today. This negative effect is only found for

medical projects and is not observed for other types of projects. They also show that refusal rates for blood tests (for anemia and HIV/AIDS) and vaccines are significantly higher in locations that experienced more colonial medical campaigns historically.

This example illustrates the importance of understanding the historical and current cultural context of a location for contemporary development policy. Once these are known, behavior that might be viewed as irrational and frustrating becomes perfectly understandable. In addition, knowing the origins of this behavior sheds light on potential solutions. The history of these locations suggests that much more needs to be done besides simply showing up and asking individuals to line up for vaccinations or blood tests. Instead, it is likely that significant outreach, communication, and a sensitivity to past experiences with Western medicine is essential.

Another example of how understanding the origins and history behind current cultural differences and how this provides information that is valuable for policy moving forward is provided by the recent study by Alsan and Wanamaker (2018). It documents that much of the elevated mortality that we observe among African American men today has its roots in the Tuskegee study, which after being exposed in 1972, caused a significant increase in distrust of medicine and the medical profession. From a public health perspective, knowing this is potentially important since it allows one to develop policies that tackle the root of the problem, which in this case appears to be distrust. This is exactly what one of the authors, Marcella Alsan, who is also a medical doctor, did in a follow-up study (Alsan et al., 2018). In it, the authors implemented a field experiment in Oakland, California, where 1,300 black men were recruited from local barbershops. The participants were provided vouchers for a free health screening that occurred in mobile medical clinics. Half of the participants were randomly assigned a black doctor and half a white doctor. The study finds that those who are assigned to a black doctor are more likely to talk about their health problems and were more likely to choose to receive additional (free) medical tests and services.

The recent study by Ashraf et al. (2020) provides an example of how an understanding of a society's evolved cultural traits is crucial for policy. Their analysis revisits one of the largest school construction projects in the world, undertaken in Indonesia in 1973. In the five years following its launch, more than 60,000 elementary schools were built. Although the school-construction project had been shown to increase boys' schooling (Duflo, 2001), on average, it did not affect girls' schooling. Ashraf et al. (2020) show that this average masks important heterogeneity. Among

ethnic groups with the practice of bridewealth – a large transfer made at the time of marriage from the husband to the bride’s family – school construction increased girls’ schooling. However, among ethnic groups without this practice, school construction had no effect. The authors show that this same pattern is found in Zambia, a country that also had a large-scale school construction project. Having shown that the success of this policy hinges critically on the cultural context, the authors provide an explanation. They show that the value of the bridewealth received by the bride’s parents is increasing in the daughter’s level of education and that this is widely known by local populations. Thus, the marriage custom provides an added monetary incentive for parents to educate their daughters. Groups with this practice are quick to take advantage of the newly-constructed schools, while those without it are not. Their findings are significant since they show that the success of important policies can hinge critically on the details of the evolved social customs of the group in question. Thus, understanding the cultural context, and the evolutionary process that generated it, is crucial for understanding the efficacy of economic development policies.

Heller et al. (2017) examine the effectiveness of a series of interventions aimed at improving the outcomes of disadvantaged youth from Chicago. One was a one-year program (2009–2010) called ‘Becoming a Man’ (BAM), which was developed by the Chicago nonprofit Youth Guidance. The other was the same program but stretched out over two years (2013–2015). The first involved 2,740 randomly-selection youth and the second 2,064 youth. Both versions of the program had significant effects. It reduced total arrests by 28–35%, arrests for violent crime by 45–50%, and arrests for other crimes by 37–43%. One also observes persistent effects on schooling outcomes: graduation rates increased by 6–9 percentage points. The third program, which had many of the same elements of BAM but was implemented among high-risk juvenile arrestees, was carried out by the Cook County, Illinois Juvenile Treatment Detention Center.

The authors study the potential mechanisms that could explain these results. They find that the evidence points to one common aspect of the interventions being important. Much of our behavior is driven by automatic impulses – what Daniel Kahneman (2011) calls system 1. This is also true for the youth in the programs, who are from distressed neighborhoods where being aggressive and fighting is often necessary in order to save one’s reputation. However, these automatic responses, although generally adaptive to the youth’s environment, may not be the best response in many situations, like in school. The programs help students develop the mental tools

necessary to switch from an automatic reaction based on system 1 to one that is more thoughtful, taking into account the specifics of the situation and relies on system 2. The experiments are able to exploit what is known about individual culture and psychology to develop what the authors call “a greater sense of occasion” (Heller et al., 2017, p. 6). This provides an excellent example that illustrates how knowing the cultural roots of behavior helps design policy that can effectively improve the actions and outcomes of those involved.

An important issue when thinking about designing policies in a way that accounts for the specific cultural context of a given setting is whether the policy could have feedback effects and alter the cultural traits. Recent evidence shows that policy can indeed have an effect on culture (Bowles and Polania-Reyes, 2012). A recent study by Bau (2019) directly examines this issue by looking at how the introduction of government pension policies affect the traditional residency practices in Ghana and Indonesia. Examining matrilocality (residence with the wife’s parents after marriage) in Indonesia and patrilocality in Ghana (residence with the husband’s parents), she shows the introduction of government pension plans (in 1977 in Indonesia and 1972 in Ghana) led to a reduction of residence with parents. Part of the benefit of the cultural tradition is that the children are able to provide old-age support for elderly parents. The introduction of the pension plans reduced this benefit of these traditions. She then goes on to show that the policy and cultural changes also had important effects on educational attainment. She first shows that matrilocality caused parents to educate their daughters more since they would be the ones looking after them in their old age. Similarly, patrilocality caused parents to educate their sons more. As a consequence, the introduction of the pension plans and the resulting weakening of the residence traditions caused a relative decline in the education of daughters and sons in Indonesia and Ghana, respectively. The study thus shows how economic policies can cause cultural change, which in turn affects economic factors.

Another example is the recent study by Gautam Rao (2019), who studies the cultural effects of a 2007 policy change in India that required most elite private schools to offer admission and enrollment to poor students free of charge. The study collects test scores and administrative data for 2,362 students from 17 private schools in Delhi, thirteen of which were subject to the policy and four of which were not. He implemented experiments among the children to measure the effects of the policy on the generosity and altruism of the wealthy students on low-income students. These comprised variants of the dictator game, as well as a more-elaborate game where students

participated in a sports day and chose children of different abilities and wealth backgrounds to be part of their team. The author uses this to measure children's willingness to trade off having wealthier but lower-ability teammates with poorer but higher-ability teammates. The study finds strong evidence that the policy had real effects. Rich students who were exposed to poorer classmates because of the policy were more willing to interact with poor students, discriminated less against them, and showed more altruism and generosity towards them.

Another line of research has tackled the closely-related question of how formal institutions, like governments and the laws they enact, affect the evolution of cultural values.⁶ Theoretical work has been done examining the relationship between formal state enforcement of cooperation and the evolution of prosocial values. Tabellini (2008b) shows that the nature of the relationship is ambiguous. Perhaps surprisingly, stronger state institutions can crowd out norms of prosocial behavior. In his model, with more state enforcement, parents optimally choose to devote less effort to instill cooperative values in their children. It is less important for parents to instill cooperative norms because state institutions ensure prosocial behavior. Thus, the behavior of children is similar whether or not prosocial values are taught by the parents. In the model, depending on parameter values, it is possible for state enforcement to also crowd-in prosocial values.

The relationship between the presence of state institutions and prosocial values has been studied empirically in a number of papers. Interestingly, the findings, to this point, are mixed. Lowes et al. (2017) study the effects of a state within Central Africa called the Kuba Kingdom on norms of rule-following using behavioral games that allow participants to cheat without being observed. One is only able to observe probabilistically whether large groups of individuals cheat. They find that the state is associated with weaker norms of rule-following. By contrast, Heldring (2020) studies the long-term impact of the precolonial Nyinga Kingdom in Rwanda. He finds that a history of living under the state is associated with stronger norms about the importance of being obedient to authority. Becker et al. (2016) examine the long-term differences between the descendants of the Habsburg Empire and the Ottoman Empire. The former was known for having a particularly well-functioning and effective bureaucracy, while the latter had a more corrupt bureaucracy. Studying individuals in villages on both sides of the historical border but

⁶For a recent review of the economic literature about the interplay between culture and institutions see Tabellini (2008a) and Alesina and Giuliano (2015).

living in the same countries today, the authors find that the Habsburg empire is associated with more trust and confidence in the courts and police. A subsequent study by Karaja and Rubin (2017) uses a similar methodology and finds that Habsburg ancestry is associated with higher levels of trust of 'outsiders,' defined as people from other villages.

Campa and Serafinelli (2019) also study the effects of communism on attitudes and norms about female employment. On average, communist countries tended to more actively promote the employment of women outside of the home, even in heavy manufacturing industries. The authors find that those in communist East Germany had more equal attitudes about female participation in the workplace. They find that this appears to be proximately affected by actual female employment and not by communist education or propaganda. They also find this same pattern when looking more broadly across countries in Western, Eastern and Central Europe, as well as looking at immigrants to the United States from these countries. A benefit of this strategy is that they are able to examine Communist and non-Communist countries before and after the onset of Communism, which provides variation across time and space in Communist policies and adds additional credibility to the estimates. Overall, the evidence that communism strongly affected gender norms by altering actual female employment appears extremely convincing.

The findings from Lowes et al. (2017) that the institutional or policy pressures move cultural traits in the opposite direction of that which is intended – a kind of backlash effect – has also been found in other settings. For example, Beaman et al. (2009) study the effects of gender quotas for seats held in Indian village councils. They find that those villagers that have a female village leader due to the quotas exhibit self-reported views that are less favorable about women's participation in politics. Despite this conscious backlash effect, the authors find that individuals subconscious stereotypes against women participating in politics, as measured by the implicit association test (IAT), are improved.

Another example of backlash is Vicky Fouka's (Fouka) study of the effects of a forced-assimilation policy in the United States against Germans following WWI. She finds that the policy, which prohibited German from being used in schools, caused Germans to hold on more closely to their culture. As a result of the policy, they became less likely to marry non-Germans, more likely to give their children distinctively German names, and less likely to volunteer for the U.S. Army during WWII. This finding can be contrasted against an (arguably) lighter-touch assimilation policy studied by Mitrunen (2019), where compulsory patriotic acts, such as standardized pledging

of allegiance to the flag, were introduced into public schools. In contrast to the findings of Fouka (2020), here it is found that this policy caused immigrants, when adults, to marry coethnic less, to give their children less ethnic names, to be more likely to volunteer for military service, and to be more likely to naturalize. These findings suggest that policies with the same intended goals can have very different effects. I view this as an important direction for future research. When do policies crowd in the intended behavior and when is there a backlash effect where the intended behavior is unintentionally crowded out?

9. Conclusions

In this article, I have provided an overview of a body of research within economics that seeks to empirically understand the determinants of cross-societal differences in culture. While the issues and questions tackled by this literature – namely, the causes and consequences of differences in cultural traits – is studied in a range of fields, the approach in this literature differs from the general approach taken in other disciplines. The line of research has made particular strides in making use of primary historical data, often from archival sources, and combining this with contemporary data to test theories about the long-term determinants of cultural traits today. This typically involves the linking of very different data sources, either through location or ancestry. There is also a particularly strong emphasis put on identifying causal effects rather than only conditional correlations. When possible, studies attempt to gain traction on causality by exploiting natural experiments or using identification strategies such as instrumental variables (IV), regression discontinuity (RD), or difference-in-differences estimators (DD).⁷

Several conclusions emerge from this literature. The first is that the evidence suggests cultural traits follow a historical process where relative costs and benefits of traits determine their evolution over time. There is now a vast literature showing that historical factors affect the evolution of traits in expected and logical ways. The second conclusion is that while deeply rooted historical factors shape culture, so do shorter-term factors, such as events that occur within a person's childhood or youth. Given the fluid and evolutionary nature of culture, it is expected that deeply historical factors, as well as shorter-term factors, are both important for shaping cultural traits.

⁷A short description of each of these is provided in the notes of Tables 1–4. Also see Angrist and Pischke (2009) for an excellent introduction to and description of these techniques.

Most recently, research has turned to the question of how a deeper understanding of the nature and origins of the cultural traits of society informs policy. From emerging research, it is clear that these factors are important for policy and can inform their implementation and design. Preliminary evidence also indicates that real-world policies can have sizeable effects on culture and that the nature of these effects is often unexpected and unanticipated by policymakers.

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