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# Culture: Persistence and Evolution

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**Abstract** This paper documents the speed of evolution (or lack thereof) of a range of values and beliefs of different generations of US immigrants, and interprets the evidence in the light of a model of socialization and identity choice. Convergence to the norm differs greatly across cultural attitudes. Moreover, results obtained studying higher generation immigrants differ from those found when the analysis is limited to the second generation and imply a lower degree of persistence than previously thought. Persistence is also country specific, in the sense that the country of origin of one's ancestors matters for the pattern of generational convergence.
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## 1 Introduction and Motivation

Learning how a person's values and beliefs are formed and transmitted from one generation to the next is the first step towards understanding the more general problem of how persistent a society's values and beliefs are – an issue on which there is abundant disagreement. Some contributions argue that values and beliefs are deeply rooted in the country or ethnic group to which a person belongs – being related for example to history or geography – and evolve slowly over time.[1] Others, instead, suggest that cultural attitudes can change rather quickly in response

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[1] See Putnam (1993), Guiso, Sapienza and Zingales (2006, 2008, 2016), Tabellini (2008a, 2008b, 2010), Alesina, Giuliano and Nunn (2013), Durante (2009), Roland (2004), Voigtlaender and Voth (2012) and Alesina and Giuliano (2015) for a recent review.

to changes in economic incentives and opportunities, in technology and in institutions.[2] Both views of culture (slow versus fast moving) have truth in them, in the sense that while some cultural traits certainly go back to the distant past and affect today's economic and institutional outcomes, it is also true that many values and beliefs evolve in response to changes in technology, economic environment, and in political institutions.

An important distinction in understanding the process through which a person's values and beliefs are formed is that between "vertical" and "horizontal" transmission. Inside the family, parents shape their children's preferences, balancing the desire to share common values with them with the concern for teaching traits that will make it easier for their children to function in the social environment in which they will live: this is vertical transmission. But children are also exposed to the world outside the family and thus are subject to a process of social imitation and learning external to the family: this is horizontal transmission.[3] Two different channels of cultural transmission are thus at work, as in models of evolutionary biology.[4] Vertical transmission, like genetic inheritance, tends to be relatively more conservative if parents main concern is to socialize children to their own values, giving rise to slow evolution of culture; horizontal transmission, as in an epidemic, may result in a rapid change in the number of people who adopt a new cultural characteristic, particularly if it is attractive to the receiver. This can happen, not in historic time, but in the space of few generations.

In this paper we investigate the speed of evolution of a wide range of cultural attitudes for different generations of immigrants to the United States. This is an important issue *per se* and it is of increasing relevance in the context of current debates on assimilation and immigration policies. Moreover, immigrants provide a useful laboratory for the study of the evolution (or lack thereof) of values and beliefs as a result of vertical and horizontal transmission because their cultural attitudes are likely to bear the mark of the country from which they, their parents or their grandparents emigrated, as early generations of immigrants may want their children to share some of the values that they, or their own parents, brought with them from their country of origin.[5] However, some of these inherited values may be at odds with the culture of the new country in which they are living, possibly hindering productive exchange with other group, and may be modified as a result of the exposure to US society and its social, political, and economic institutions, often very different from those of the country of origin. Immigrants and their descendents thus provide an interesting quasi-experiment for the effect on inherited cultural attitudes of a change in the economic and social environment. The conditions under which this

[2] See Gruber and Hungerman (2008), Alesina and Fuchs-Schuendeln (2007), DiTella, Galiani and Schargrodsky (2007), Giuliano and Spilimbergo (2014), Fernandez (2011), Fehr (2009), and Bowles (1998).

[3] The transmission that occurs from a member of the previous generation who is external to the family to a member of the present generation is often called oblique. We consider it as a part of horizontal transmission.

[4] See Cavalli-Sforza (1981) and (2001, ch.6), Boyd and Richerson (1985, 2005).

[5] See Fernandez (2008).

leads to integration of immigrants or to the emergence of immigration clusters in which separate cultural traits persist has been debated in the theoretical and empirical literature.[6]

We look at a variety of attitudes, rather than a single one because we surmise there could be substantial heterogeneity across cultural traits (and immigrants' origins as well) in the speed with which attitudes evolve across generations. We study the transmission of attitudes through four generations (a century) because it is possible that some attitudes may appear to be quite persistent within a couple of generations but change significantly by the fourth generation. We use data from the General Social Survey (GSS) to analyze the evolution of cultural attitudes of US immigrants about religion, family, gender, sexuality, cooperation, redistribution, etc., distinguishing between first, second, third and fourth (or higher) generations of British, Irish, German, Italian, Polish , Scandinavian and Mexican immigrants to the United States. The focus on these groups is largely imposed on us by the availability of sufficient data for multiple generations distinguished by country of origin. We use the data contained in approximately 21 waves (the exact number varies across attitudes) of the GSS survey collected between the end of the 1970's and 2014. Although the GSS is far from being perfect, it is the only data source that allows a systematic investigation of the evolution of cultural values for *multiple* generations, *multiple* countries of origin and *multiple* traits.

In order to provide some structure in discussing the results, we develop a simple model of socialization and identity choice. The model builds on the contributions by Bisin and Verdier (2001) on parents's socialization choices, and on Lazear (1999) and Konya (2005) for a child's choice of her cultural identity. Parents derive utility form the child retaining their original cultural traits, but also consider the possibility that this may hinder the child's ability to interact productively with the majority. The child plays an active role in the model and chooses her identity weighing the expected transaction gains from assimilation and a switching cost that partly depends upon the parents' socialization effort, and which also contains a component that is randomly distributed across the population. Parents choose the optimal level of socialization taking into account the child's optimization problem, knowing the distribution of the switching cost, but not the particular realization for their child. Insofar as in our set up parents also care about the ability of their children to interact productively with others, our model is also related to Doepke and Zilibotti (2008) who see "vertical transmission" as an active process of socialization where parents attempt to endow their children with values that they think will lead to success. Our model captures this through a parameter that describes how much a parent cares about the child's future well being.

[6] See the seminal paper by Lazear (1999) on the incentives to and conditions for integration in heterogeneous populations and the inter-temporal extension in Konya (2005). Bisin and Verdier (2000), (2001) provide conditions under which heterogeneity in cultural values may be a stable equilibrium in an optimizing model of cultural transmission under imperfect parental empathy. See also Bisin, Topa and Verdier (2004), Tabellini (2008b), and Bisin and Verdier (2010) for a review. See also Guiso, Sapienza and Zingales (2008) for a model of transmission of beliefs, Fernandez (2013) for a model of beliefs formation, Doepke and Zilibotti (2008) and Doepke and Zilibotti (2017) for a model, respectively, of endogenous preference formation and one that mixes paternalism and altruism in preference transmission.

Our model yields two possible equilibria: one with complete assimilation and another with the minority group not assimilating. The occurrence or not of assimilation, and its speed when it happens, depend upon a set of parameters that are likely to vary across different cultural traits and across different countries of origin, such as the child's net transaction gains and the switching costs from assimilating, the utility benefit to the parents from the child maintaining the original trait, together with the costs of the socialization effort, and, finally, the discount factor parents apply to the child's utility. A contribution of our model is the result that there can be equilibria characterized by no assimilation even without imposing the "cultural substitutability property" of Bisin and Verdier (2001), whereby a minority parent makes a greater effort at socialization when the initial size of the minority is small.

In studying how a person's values and beliefs are formed and transmitted from one generation to the next, and whether or not they converge, we face a number of empirical challenges. First and foremost, immigrants, even from the same country of origin, differ, depending on when the first generation of the "dynasty" they belong to arrived in the US. Irish immigrants who arrived in the 1890s, for example, are clearly different, in terms of the values they brought with them, from post World War II first generation Irish immigrants. One has to account for this in the empirical work, in order to separate convergence of values across generations of immigrants from convergence of values over time across countries of origin. We address this problem studying the transmission of values and beliefs within a single "synthetic" dynasty, specifically the one that starts with first generation immigrants born at the end of the 19th century/beginning of the 20th century. We then follow the cohort of the children of this first generation (assumed to be the second generation immigrants born 25 years later), the cohorts of their grand children and of their grand-grand children. We discuss in detail how we estimate the cultural attitudes of the various cohorts of our synthetic dynasty in section 3.2.

A second empirical challenge is that, once one allows for a general model which includes generation effects that vary across cohorts for each country, one is left with relatively small cell sizes for the first generation, particularly for some countries. We will address this problem at the end of the same section, yet one must recognize that the GSS is the only data set containing information on a range of cultural attitudes for several countries of origin and multiple generations of immigrants within a dynasty.[7]

[7] One may wonder whether US Census or CPS data could be used to investigate the convergence of attitudes over multiple generations. The answer is unfortunately no. When using these data sets one could think, for instance, of focusing on the effect of the country of origin on female labor force participation (an outcome of cultural attitudes about gender roles, in addition to other factors). In the Census or the CPS, however, one can identify, at best, only the birthplace of the respondent and of her parents (available in the Census only up to 1970 and in the CPS from 1971 to 1975). This gives us information on the country of origin of the first and second generation immigrants. In order to identify the birthplace of the ancestors of third or higher generation immigrants, one must rely on self reported ancestry (available in the Census since 1980 and in the CPS since 1994). Note that the periods for which ancestry information is available together with information on the respondent's and her parents' birthplace are not overlapping, making an investigation of convergence across multiple generations (first, second, third and beyond) not possible even for this single outcome.

We are certainly not the first ones to analyze these issues.[8] However, most existing contributions focus on the *persistence* of cultural traits for *second* generation immigrants and on their effect on economic and social outcomes. For instance, Giuliano (2007) presents evidence that cultural heritage is important for living arrangements, Fernandez (2007) for female labor force participation, and Fernandez and Fogli (2009) for female labor force participation and fertility outcomes, all using US census data. Fernandez and Fogli (2006), using the GSS, finds results that are also supportive of an effect of the culture of the country of ancestry on fertility outcomes for US immigrants, although no distinction is made between second and higher generation immigrants. Guiso, Sapienza and Zingales (2006), using the GSS, find evidence suggesting that the trust of US immigrants (not distinguished according to the generation they belong to) strongly depends upon the country of origin. Exceptions, in the sense that they use generations beyond the second, are Antecol (2000) – who finds that culture matters for the gender gap in labor force participation, for both the first, second and higher generations of US immigrants, although less for the latter – and Borjas (1992) who shows that ethnic capital (measured as average ethnic-specific education, professional achievement or wages) has a greater effect on children's education, occupation and wages for both the second and the third generation, although the effect tends to be higher for the second. Algan and Cahuc (2010) show that inherited trust of descendants of immigrants in the US is significantly associated with the level of trust in the country of origin. This results holds even if one limits the analysis to fourth generation immigrants.[9]

The paper has three main findings. Our first result is that time since the original immigration of the ancestors matters: results obtained studying higher generation immigrants differ from those obtained limiting the analysis to the second generation. Thus, finding that the attitudes of second generation immigrants have not converged yet and still closely reflect those of the country of origin, does not imply *per se* that attitudes are very persistent. For instance, we find that the beliefs that shape trust of second generation immigrants towards other members of society remain different from the prevailing US norm and still bear strongly the mark of the country of origin. However, such differences become smaller when one considers fourth or higher-generation immigrants.

Second, we provide evidence of heterogeneity across cultural traits in the speed with which they evolve across generations and the degree to which converge to the prevailing norm. We find, for instance, that attitudes towards cooperation (the trustworthiness, helpfulness and fairness

[8] Earlier contributions in the sociological literature used early waves of the GSS, and focus on the assimilation process of specific groups, such as Italian immigrants in Greeley (1974, ch.4) and Alba (1985, ch.6). The results in Greeley are based on a sample of males only. Both studies emphasize the change, as opposed to the persistence of cultural attitudes, but do not distinguish among different generations.

[9] Voigtlaender and Voth (2012) document the persistence of anti-semitic traits in German cities over centuries. Rice and Feldman (1997) distinguish the level of civic attitudes for Italian immigrants on the basis of the number of grandparents born in the US and reach the surprising conclusion that the descendants of earlier immigrants are more likely to give *less* civic responses than the descendants of later immigrants. Desmet, Ortuño-Ortín and Wacziarg (2015) investigate whether ethnic, linguistic and religious identities are "constructed" or reflect "primordial" differences between different groups of humans. They find that ethnicity is indeed associated with fundamental differences in values, attitudes and preferences, however, there are many other sources of variation in culture, not associated with ethnic identity.

of others) display the highest degree of convergence by the fourth generation, as successive generations adapt to the norms of the new society in which they live. Attitudes towards politics and the role of government, sexual morality and abortion exhibit the lowest degree of convergence, followed by religious attitudes. Attitudes towards gender roles occupy an intermediate position, with attitudes towards the role of women in the labor market converging faster than those related to the role of women in politics. Family attitudes also display on average an intermediate level of convergence, but there is substantial heterogeneity among them.

Many of these results are largely consistent with one prediction of our simple model: faster convergence is observed for attitudes that are likely to generate larger transaction gains from assimilation, such as attitudes towards cooperation. Convergence is also slower for attitudes for which the utility gain to the parents from the child retaining the original trait (or the cost for the child to abandon them) is likely to be higher, such as some moral and religious values and political orientation.

Third, we find that persistence is country specific in the sense that the country from which one's ancestors came from matters in defining the pattern of integration (or lack thereof) with respect to the entire set of cultural traits. Moreover, the strength of the family in each country of ancestry, the degree of difficulty in learning English, and the extent of residential segregation are (negatively) correlated with the fraction of convergent attitudes. These results too could be interpreted in the light of our model: switching costs, for instance, are likely to be related to language proximity and to the strength of family ties. However, given the small number of countries in our sample, this results must be taken with a grain of salt.

The plan of the paper is as follows. In Section 2 we illustrate a simple model of parents' socialization and children's identity choice. In Section 3.1 we discuss how we measure cultural attitudes in the GSS, how we define generations and ethnic origin and which countries (or groups of countries) we use in our analysis. In Section 3.2 we describe how we recover the country of origin effect for different generations, dynasties and time periods, while in Section 3.3 we illustrate our measure of cultural "convergence". In Section 4 we present and discuss our main empirical results. Section 5 contains several robustness checks and extensions. Section 6 concludes.

## 2 A Model of Cultural Transmission

A simple model will help us interpret our main empirical findings. The model provides a framework to understand why the dynamics of cultural convergence may vary across different attitudes or countries of origin. The main idea is that a person's traits evolve through two parallel processes: vertical transmission within the family and horizontal transmission associated with social interactions outside the family. We draw on the vast literature carefully reviewed in Bisin and Verdier (2010).[10]

[10] See also Pichler (2010), Vaughan (2013), and Panebianco (2014).

In this section we describe the set up of the model, summarize its main results and draw the implications for the evolution of attitudes; details are consigned to an online appendix (Appendix 2). We assume there is one cultural trait in the population that can take two values: one associated with the minority, denoted by $m$, the other associated with the majority, denoted by $M$. We normalize the population to one and assume that the initial size of the minority is $q$. Personal attitudes of a second-generation immigrant belonging to the minority group are shaped by two forces: "vertical" transmission within the family and "horizontal" transmission from social interactions outside the family. Traits are first transmitted inside the family from parents to their children. As children interact with people outside the family, they may realize that the traits acquired from their parents are not ideal (in a sense that we shall make precise in a moment) for social interactions outside the family.

We break down the analysis of how attitudes evolve in three steps. First we focus on the child's problem of choosing an identity: what determines her decision whether or not to "assimilate", that is to abandon the minority trait and acquire the majority one?[11] Building on Lazear (1999) and Konya (2005), we assume that acquiring the majority trait allows a minority member to interact more productively with the majority. However, it also generates a transaction cost in dealing with members of the minority. Moreover, abandoning the original family trait implies a utility cost for the child that, in part, depends upon the effort the parents have put in socializing her. The second step is the parent's socialization problem: parents prefer children with their own cultural trait and hence educate them to this trait, as in Bisin and Verdier (2001). The parent however also "empathizes" with her child, in the sense that she understands that the trait she is trying to transmit may hinder the child's opportunities in the new society. The investment in education by the parent optimally balances these two incentives.

To keep the problem simple, we assume that each individual lives two periods. In the first she is socialized to the family's values by her parents and interacts with the other young people in society. In the second period she becomes the single parent of a child and decides how much effort to put in socializing the child to her own trait – for instance spending time teaching her ancestors' values. Finally, having analyzed the child's decision whether or not to assimilate, given the education effort optimally chosen by her parent, we shall study how the size of the minority evolves over time, given that the cost of assimilation is distributed randomly in the population and its realization is known by the children but not by the parents. In this model there are two possible equilibria: one in which no child assimilates and the size of the minority group remains constant at the initial level, and one in which instead children assimilate and the minority trait eventually disappears from society. Which of these two equilibria occurs and the speed of convergence to the full assimilation equilibrium depend upon a set of parameters that capture the costs and benefits of assimilation for the child and of the socialization effort for the parent, and that are likely to vary across cultural traits, and also across countries of origin.

[11] See also the seminal paper on identity choice by Akerlof and Kranton (2000), as well as Bisin, Pattachini, Verdier, and Zenou (2011).

### 2.1 The model set up: child identity choice and parent socialization problem

The child's problem is a simple variant of Lazear (1999)[12]: $V^i$, ($i = m$ or $M$) denotes the surplus produced by a social interaction between two persons both belonging to the same group – minority or majority. We assume that the two surpluses are identical ($V^m = V^M = V$), a simplifying assumption which is not central to our results. The interaction between two persons with different cultural traits implies a loss. More specifically, $V(1-\theta^M)$ is the surplus produced by a social interaction between a person, whose parents belong to the minority and who has not assimilated, with another person belonging to the majority, with $0 < \theta^M < 1$. $V(1-\theta^m)$ is the surplus of the interaction between a person whose parents belong to the minority and who has acquired the majority trait, with another person from the minority, with $0 < \theta^m < 1$. We will assume that $\theta^M > \theta^m$ because it is plausible that the child of a minority parent retains some ability to interact with members of the minority even if she assimilates. There is no loss in the transaction when two people have the same trait and in this case the surplus is $V$. The proportion of the minority group in the population is $q < \frac{1}{2}$ (we omit the time subscript here to keep the notation light). The utility cost for a member of the minority for abandoning the parent's trait equals $d\tau + z_i$, with $d > 0$. It is increasing with the parent's socialization effort $\tau$ and also includes an additive person specific stochastic component, $z_i$ , that can be interpreted as the cost of learning the new (majority) trait for individual $i$. We assume $z_i$ to be distributed randomly in the population according to the distribution function $G(.)$. For simplicity we assume that $z_i$ is uniformly distributed on $[\underline{z}, \overline{z}]$. The child knows her $z_i$, while the parent does not observe it, but knows its distribution $G(.)$. The choice of the uniform distribution and of simple functional forms for the various cost functions is made in order to obtain explicit solutions that help understand the basic logic of our model.

The child meets at random individuals from the minority or majority groups with probability $q$ and $1-q$ respectively. The probability for a member of the minority to meet another minority member does not necessarily correspond to the frequency of the minority trait in the population, if there is spatial segregation. We allow for spatial segregation later, but we will treat it as exogenous: endogeneizing the location choice is important, but goes beyond the purpose of this paper.

Following Lazear (1999) we assume that the child decides at the beginning of the period whether or not to assimilate, knowing the probability of meeting a minority or a majority member, but before having actually met them. Children are myopic, in the sense that they do not look ahead to when they will become parents. A child $i$ assimilates if the expected gain from assimilation is higher than the expected gain from non-assimilation. This occurs when $(1-q)V\theta^M - q\theta^m V - d\tau - z_i \geq 0$. If $(1-q)V\theta^M - q\theta^m V - d\tau > \overline{z}$ the child will always decide to assimilate (in this case $G(.) = 1$). If $(1-q)V\theta^M - q\theta^m V - d\tau < \underline{z}$ the child will never assimilate

[12] See Konya (2005) for a dynamic extension.

$(G(.)=0)$. When $\underline{z} \leq (1-q)V\theta^M - q\theta^m V - d\tau \leq \overline{z}$, the child will assimilate with probability:

$$G\left((1-q)V\theta^M - q\theta^m V - d\tau\right) = \frac{(1-q)V\theta^M - q\theta^m V - d\tau - \underline{z}}{\overline{z}-\underline{z}} \tag{1}$$

Each family is a single-parent family, raises only one child and only cares about her immediate descendants. As in Bisin and Verdier (2001) the parent can affect the probability that the child assimilates socializing her to the family values at a cost $\frac{c}{2}\tau^2$ with $c>0$ (and therefore increasing in $\tau$ at an increasing rate) and derives utility $\varphi$ if the child maintains the family trait.[13] The parent also cares about her child's utility and how it is affected by how productively the child will relate with the majority (and the minority). The extent of empathy by the parents is described by $\beta$: for $\beta=0$ the parent doesn't care about the child's utility and only cares about her wish that the child does not assimilate. Parents characterized by higher values of $\beta$ are thus increasingly "altruistic" in the sense of Doepke and Zilibotti (2008) who describe parents who strive to shape their children's preferences in a way that best fits with their future material circumstances.[14] The presence of an active identity choice by the children and of an altruistic component in parents utility – in a model with a distribution of assimilation costs known to the child but not the parents – is thus different from the Bisin and Verdier (2001) assumption of imperfect empathy and passive offsprings.

In the Appendix 2 we show that the expected utility of the parent, $w(\tau)$, is maximized when:

$$c\tau + \beta d\frac{(1-q)\theta^M V - q\theta^m - d\tau - \underline{z}}{\overline{z}-\underline{z}} = \frac{\varphi d}{\overline{z}-\underline{z}} \tag{2}$$

The interpretation is simple. The left hand side is the marginal cost to the parent from varying $\tau$: this is the sum of the marginal direct socialization/education cost plus the expected change in the assimilation cost for the child, discounted by $\beta$ (the parent's imperfect empathy parameter). The right hand side reflects the change in the expected direct benefit for the parent from non-assimilation. Solving for the optimal level of $\tau$, $\tau^*$, one obtains:

$$\tau^* = \frac{\varphi - \beta[(1-q)\theta^M V - q\theta^m V - \underline{z}]}{\frac{c(\overline{z}-\underline{z})}{d} - \beta d} \tag{3}$$

The comparative statics for $\tau^*$ is intuitive.[15] For instance, the parent's effort is increasing in $\varphi$, her benefit if the child does not assimilate, and in the effectiveness of the socialization technology,

[13] We could allow $\varphi$ to depend linearly upon the intensity of socialization, but this would complicate the exposition with no substantive gains.

[14] Abramitzky, Boustan and Eriksson (2016), studying the cultural assimilation of immigrants to the U.S. during the Age of Mass Migration, also highlight empirically the tradeoff that immigrant families face between maintaining their cultural identity and assimilating into society at large. They focus on naming patterns and find that giving one's child an ethnic-sounding name to enhance self-identification with an ethnic group results in less favorable educational and economic outcomes.

[15] Note that for concavity of the objective function $\frac{\partial^2 w}{\partial \tau^2} = -c + \frac{\beta d^2}{\overline{z}-\underline{z}} < 0$ and hence the denominator in (3) is positive. We also assume that $\varphi - \beta[(1-q)\theta^M V - q\theta^m - \underline{z}] \geqslant 0$ to guarantee that the parent's effort is non negative.

represented by $d$. It is instead decreasing in $c$, the cost of the effort put into educating the child. It is also decreasing in $\theta^M$, the penalty for the child of a minority parent in interacting with members of the majority, if she holds on to the family trait, and increasing in $\theta^m$, the penalty for the child of a minority parent in interacting with members of the minority, if she adopts the majority trait. The effect of an increase in the total surplus from transactions, $V$, is negative, as we have assumed that $q < \frac{1}{2}$ and $\theta^M > \theta^m$.

For given values of $\theta^M$ and $\theta^m$, an increase in $q$ raises the parent's socialization effort because it decreases the probability of meeting a member of the majority, diminishing the net expected penalty for non assimilated descendants of minority parents.[16] Our model, therefore, does not display the "cultural substitutability property" of Bisin and Verdier (2001), whereby a minority parent makes a greater effort at socialization when the minority is small, which in their model generates the possibility of cultural heterogeneity as an equilibrium outcome. However, in our set up with heterogeneity in assimilation costs, a child identity choice and altruistic parents, we will show that there are parameter configurations such that the initial frequency of the minority trait is a possible equilibrium. This is the topic of the next session.

### 2.2 Assimilation and Non-Assimilation Equilibria and Dynamics

Our set up generates two types of equilibria, one in which the minority fully assimilates and another in which it holds on to the original values. Which type of equilibrium occurs depends upon the model parameters and the initial size of the minority. More specifically, assume that at the initial proportion of the minority, $q(0)$, there is an incentive for at least some of its members to assimilate, which occurs when $\underline{z} \leq (1-q(0))\theta^M V - q(0)\theta^m V - d\tau^* \leq \overline{z}$ . The decrease in the proportion of the minority between $t+1$ and $t$ , $-(q_{t+1}-q_t)$, equals the proportion of the minority that assimilates between these two dates, $G\left((1-q_t)\theta^M V - q_t\theta^m V - d\tau_t^*\right)$, times the size of the minority at $t$, $q_t$[17]:

$$\begin{aligned} q_{t+1} - q_t &= -\,G\left((1-q_t)\theta^M V - q_t\theta^m V - d\tau_t^*\right) q_t \\ &= -\,\frac{(1-q_t)\theta^M V - q_t\theta^m V - d\tau_t^* - \underline{z}}{\overline{z}-\underline{z}} q_t \end{aligned} \tag{4}$$

When, instead, $(1-q_t)\theta^M V - q(0)\theta_t^m V - d\tau^* < \underline{z},$ nobody assimilates, $G(.) = 0$ and $q_{t+1} - q_t = 0$. This observation allows us to determine the possible steady state equilibria (where $q_{t+1} - q_t = 0$)

[16] The remaining comparative static is somewhat more complicated. The effect of the discount factor $\beta$ is ambiguous as it enhances both the transaction benefits of assimilation ($(1-q)\theta^M V - q\theta^m$) and the switching cost of assimilation ($d\tau + z_i$). For a given spread of the distribution, $\overline{z}-\underline{z}$, a decrease in $\underline{z}$, that generates a leftward shift of the distribution, decreasing its mean, but keeping the variance constant, is associated to a decrease in $\tau^*$. This is because the probability of assimilation increases, which increases the penalty for the child of dropping the family trait, a penalty that is greater the larger the parent's educational effort. Given $\underline{z}$, an increase in $\overline{z}-\underline{z}$ has the opposite effect by a similar logic.

[17] We assume that no member of the majority has an incentive to adopt the minority trait.

and their stability properties.[18] Consider the value of $q_t$, $\tilde{q}$, such that $(1-\tilde{q})\theta^M V - \tilde{q}\theta^m V - d\tau^* = \underline{z}$ so that there is no gain from assimilation. For greater (smaller) values of $q(0)$ the net gain is negative (positive). It is easy to show, using equation (3) that:

$$\tilde{q} = \frac{\theta^M V - \frac{\varphi d^2}{c(\overline{z}-\underline{z})} - \underline{z}}{\theta^M V + \theta^m V} \tag{5}$$

Moreover we show in Appendix 2 that $0 < \tilde{q} < 1$. If $\widetilde{q} < q_0 < \frac{1}{2}$, then the initial proportion of the minority is an equilibrium because there is no net gain from assimilation. If, instead, $q_0 < \text{Min}(\frac{1}{2}, \tilde{q})$ the evolution of cultural traits is determined by equation (4) and the steady state equilibrium implies full integration ($q = 0$). The full integration equilibrium is locally stable with the minority gradually shrinking in size. All this is summarized in Figures 1a and 1b, where the steady state(s) and dynamics of the system are represented. The phase line can be shown to be upward-sloping and convex and it intersects the 45 degree line in 0 and $\tilde{q}$. In Figure 1a we present the phase diagram for the case in which $\widetilde{q} < \frac{1}{2}$, so that two equilibria exist, one with full integration and one with no integration (associated with an initial size of the minority equal to $q_0^a$ and $q_0^{na}$ respectively). In Figure 1b, we present the case in which $\tilde{q} \geq \frac{1}{2}$ so that only the full integration equilibrium exists.

It is easy to see from equation (5) that $\tilde{q}$ increases – and hence the range of initial values of $q_0$ for which the full assimilation equilibrium occurs becomes larger – with the loss for a non assimilated person in her dealing with the majority, $\theta^M$; with the size of the total surplus from the transaction, $V$; with the cost to the parents of the socialization effort, $c$; with an increase in $\overline{z} - \underline{z}$ for a given $\underline{z}$ (so that both its mean and variance increase). $\tilde{q}$ instead decreases with $\theta^m$, the penalty for an assimilated child of a minority parent from dealing with members of the minority; with the effectiveness of the socialization technology, $d$; with the direct benefit to the parent of the child maintaining the original trait, $\varphi$; and with a shift to the right of the distribution of $z_i$ (so that the mean increases for a given spread of the distribution). With one exception, the qualitative effect of the parameters on $\tilde{q}$, and hence on the probability that an assimilating equilibrium occurs, is identical to their effect on the speed with which assimilation occurs, captured by $G(.)$ in equation (4). Essentially, both sets of effects depend upon how the optimal socialization effort $\tau^*$ responds to parameter changes. The exception is the parent's discount factor, $\beta$. Its effect on the speed of assimilation is ambiguous as it enhances both the transaction benefits of assimilation for the child ($(1-q)\theta^M V - q\theta^m$) and the switching cost of assimilation ($d\tau$). However, $\beta$ has no effect on $\tilde{q}$: this is because at $q = \tilde{q}$ the probability of assimilation is zero, so the second term on the left hand side of the first order condition for $\tau$, equation (2), is zero, i.e. there is no expected cost for the parent from the child assimilating. As a result, at $q = \tilde{q}$, $\beta$ does not matter for $\tau^*$ and, hence, for $\tilde{q}$.

[18] If $(1-q(0))V\theta^M - q(0)\theta^m V - d\tau^* > \bar{t}$ , the model would generate an uninteresting and implausible dynamics with instantaneous full assimilation.

### 2.3 Discussion

It is possible to tweak the model to recognize that, because of geographic segregation, the probability for a member of the minority of encountering another member of the same minority may differ from the share of the minority in the population, provided the latter is treated as exogenously given. If we keep using $q_t$ to denote the probability of encountering someone with the same minority trait, and use $\pi_t$ to denote the proportion of the population with the minority trait, then we can show that the basic insights we reached above about the dynamic behavior of $q_t$ also apply to $\pi_t$.[19] Moreover, now the intensity of a parent's socialization effort increases in $\pi_t$ and in the degree of segregation because both decrease the probability of meeting a member of the majority and hence of paying a net penalty when non assimilated. As a result the probability of a non convergence equilibrium increases in the degree of (exogenous) segregation. This prediction is consistent with the findings of Fernandez and Fogli (2009) who have shown that the degree to which second-generation Americans tend to live in the same neighborhood enhances the preservation of the country of ancestry culture. The issue of how to endogenize the location choice of immigrants is an important and interesting topic that we leave however for future research.[20]

The model overlooks the effect of reproductive success on the spread of cultural traits. In fact we assumed that each family is a single-parent family which raises only one child. This assumption excludes the possibility that the same factors driving the incentive to assimilate may determine reproductive success. However, if some cultural traits have evolved due to their economic significance, assimilation will have an impact on income and on reproductive success, with the sign of the correlation between the two depending upon the economic environment, as the latter determines which trait confers an evolutionary advantage (Galor and Moav (2002)).[21]

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[19] Define $\gamma = \frac{\pi}{q}$. Then $\gamma$ can be thought of as an inverse index of spatial segregation. We assume that $\gamma$ is exogenous and constant and $\pi < \gamma \leq 1$ with $\gamma = 1$ representing the case of an evenly spread minority. $\pi < \gamma$ guaranties that $q$ does not exceed one. Then the equation of motion for the proportion of the population with the minority trait becomes $\pi_{t+1} - \pi_t = -\frac{[(1-(\pi_t/\gamma)]\theta^M V - (\pi_t/\gamma)\theta^m V - d\tau_t^* - \underline{z}]}{\overline{z}-\underline{z}}\pi_t$ The proportion of the population with the minority trait at which there is no gain in assimilating now equals $\widetilde{\pi} = \gamma \frac{\theta^M V - \frac{\varphi d^2}{c(\overline{z}-\underline{z})} - \underline{z}}{\theta^M V + \theta^m V}$ which is increasing in $\gamma$.

[20] In our model the decision whether or not to assimilate is studied along a single dimension/attitude. The results however extend to the contemporaneous choice of more than one trait, provided we exclude interactions across attitudes. Assume there are two traits $a = 1, 2$, each one of them dichotomous. Assume that costs and benefits are additive and that there is no interaction between the two traits, that is socialization costs are $\frac{c}{2}\tau_1^2 + \frac{c}{2}\tau_2^2$ for the parents and direct socialization benefits are $\varphi_1 + \varphi_2$. Assume that switching costs are also additive for the child, $(d\tau_1 + z_1) + (d\tau_2 + z_2)$, and that the two stochastic terms $z_1$ and $z_2$ are independent. Finally assume that the net benefits associated with each attitude are $\theta_a^{M*}(1 - q_a)V_a - \theta_a^{m*} q_a V_a - d(\tau_a) - z_a$, $a = 1, 2$ again assuming lack of interaction. In this simple case the conditions for $\tau_1^*$ and $\tau_2^*$ are identical to those we have derived and simply need to be indexed by $a = 1, 2$. Of course the model would be more complicated if we allowed for cross affects across attitudes, but this is not central to our paper and is left for future research.

[21] In their model, in the pre-demographic transition period, income and fertility rates are positively correlated and Malthusian pressure confers an evolutionary advantage to those people with a preference biased towards child quality versus quantity. Once the economic environment improves, the opposite is the case. Empirically, during the period covered by our investigation there is negative association between fertiity and income (Jones and Tertilt (2008)).

Galor and Ozak (2016) develop a model in which agro-climatic characteristics conducive to higher agricultural yields at the time of the Columbian Exchange trigger selection, adaptation and learning processes that generate a positive effect on the prevalence of long term orientation today and provide empirical evidence to this effect. The model allows for vertical transmission of traits (the trait of the parent is automatically transmitted to the child), endogenous fertility and occupational choices and learning. It would be interesting and important to add a fertility choice to our model of socialization and identity choice, but it goes beyond the scope of this paper. As for the possibility of endogenizing spatial segregation this remains an important question for future research.

Summarizing: the model is indeed simple but it helps us think about the different speed of convergence of various attitudes, as they are shaped by vertical and horizontal transmission. Cultural attitudes differ in the advantage that assimilation confers to the child in transacting with the majority and in the costs that assimilation implies for her, partly shaped by the parent's socialization effort. They also differ in the utility gain they imply for the parent when a child retains the minority cultural trait and in the cost that the parent's educational effort entails. For attitudes related to cooperation, such as trust and views of other being helpful and fair, there are likely to be large transaction gains for the child from assimilating. Trust, for instance, plays an important role in economic and social interactions and one can easily imagine, how, for instance, it may pay for an individual to trust others, even if starting from a relatively low trust level.[22] For other traits, such as those related to moral values concerning abortion or sexuality, religious attitudes, general political views, and some family or gender attitudes, the transaction payoff from converging to the majority trait is likely to be smaller. Moreover, for such attitudes there may be large gains for the parents if the child maintains the minority trait, or a large cost for the child if she abandons her family's traditional values and beliefs. The model also suggests that patterns of integration may differ depending on the country of origin of each immigrant group because of cross country variation, for each cultural attitude, in the costs and benefits of integration. For instance, cross country variation in the strength of family ties may be reflected in differences in the perceived benefit for the parents from the child not dropping the trait transmitted within the family. Similarly, the cost for the child of acquiring a new trait may differ across countries. We will use these insights in discussing the empirical evidence on the heterogeneity across attitudes in the speed of convergence of values and beliefs of successive generations of immigrants to the US, and how it varies across countries of origin.

## 3 Data and Empirical Strategy

In this section we describe how we measure cultural attitudes and we illustrate our empirical strategy.

[22] The acquisition of new values may also occur through vertical transmission, with parents actively encouraging "new" values (or refraining from insisting on "old" one) in response to changes in the social environment as suggested by Doepke and Zilibotti (2008).

### 3.1 Measuring Cultural Attitudes and Defining Generations and Country of Origin in the GSS

Our measurement of cultural attitudes is based on the General Social Survey (GSS). We use multiple (21) waves of the GSS, starting in 1978 and ending in 2014. Each wave includes a core set of questions that remains in the survey in each year in which it was conducted. This core includes personal information such as age, income, region of residence and family origin, as well as information on personal views on a variety of topics such as family values, gender roles, religious beliefs, sexual behavior, cooperation, role of government, etc.

One of the advantages of the GSS is that it allows us to analyze a wide variety of attitudes over several generations of immigrants. We have selected the attitudes for which data were available over a relatively long span of time, up to three decades (or slightly more) and capture views and beliefs regarding cooperation, politics, religion, family gender, sexuality etc.. For ease of interpretation we have grouped attitudes (or questions) into several broad categories.[23] The list of categories, variables, and coding choices is provided in Table 1.

To capture attitudes toward cooperation we use trust in others (*trust*), and views about the fairness (*fair*) and helpfulness of others (*helpful*) (Group A). Attitudes towards government intervention – should the government redistribute income (*eqwlth*), or provide a safety-net for the poor (*helppoor*) – and overall political views (*polviews*) make up group B. Group C contains religious attitudes such as the frequency of attendance to religious services (*attend*), the frequency of personal prayer (*pray*), the strength of affiliation with one's religion (*reliten*), the belief in after-life (*postlife*) and the approval of prayer in public schools (*prayer*). Attitudes about family and children make up group D and include views on the degree of parental consent in teenage access to birth control (*pillok*), on the restrictiveness of divorce law (*divlaw*), on the co-residence of multiple generations (*aged*) – i.e. whether one approves of children living with their parents beyond a certain age – and on the frequency of evenings spent with relatives (*socrel*). This group also includes views on preferred qualities in children such as obedience (*obey*) and independence (*thnkself*). To capture views on gender roles we use the questions: Can working mothers have a warm relationship with their children? (*fechild*); Women are not suited for politics (*fepol*) (these constitute group E). Group F reports views on legalized abortion for any reason (*abany*) or restricted to cases of risk for the mother's health, defects in the fetus, or rape (*abrisk*). Group G covers attitudes towards sexual behavior such as pre-marital sex (*premarsx*) and homosexual sex (*homosex*). Finally Group H includes the question about views on whether social mobility is the result of hard work versus help or luck (*getahead*), a belief that could not be easily classified in any of the other groups, but that conveys important information on the perceived ability to affect one's own destiny.[24]

[23] For the choice of groups, we have followed one of the available codebooks for the GSS. See Muennig, Kim, Smith, and Rosen (2011).

[24] It would be very interesting to investigate the evolution of cultural traits that capture long term orientation. Unfortunately, a crucial component of long term orientation is "thrift" as a desirable characteristic of children (see, for instance, Hofstede and Minkov (2010), Galor and Ozak (2016) and Figlio et al. (2016)). This variable

The premise of our study is that values and beliefs are formed in part as a result of one's upbringing, and in part through the influence of factors external to the family such as peers, institutions, and economic circumstances. Consequently, values and beliefs depend both on the country of origin of a person's ancestors, as well as on her generation (to be defined below). The country of origin is an important determinant of culture as it encodes the history of a people, encompassing past technological, economic, institutional and cultural environments. The generation of a person is important given that the temporal "distance" from the country of ancestry may be associated with a dilution of the original cultural trait through longer exposure to a different set of economic and social opportunities, to different institutions, and cultural influences.

We consider the evolution of attitudes over multiple generations (up to the fourth). As a result, we are constrained by data availability to focus on immigrants to the US from a limited number of European countries and from Mexico. We focus on countries for which we have relatively numerous observations: Great Britain (GB), comprising England, Wales and Scotland, Germany, (GER), Poland (POL), Ireland (IRE), Italy (ITA) and Mexico (MEX). In addition we consider Scandinavian immigrants from Denmark, Norway, Sweden and Finland as a single group (SCA) on the basis of a relatively common cultural background.[25] These groups together constitute a very large fraction of the historical immigration to the US from Europe and Latin America.

We define the generation to which an immigrant belongs following what is typically assumed in this literature. We define a person to be a first-generation immigrant if he/she was born outside of the United States. Immigrants are defined to be second-generation if they are born in the US and at least one of their parents was born abroad, and third-generation if they are born in the US, all of their parents are born in the US and at least two of their grandparents were born abroad. Lastly, a person is said to be of fourth-generation-or-more if he/she is born in the US, all his/her parents are born in the US and at most one grandparent was born abroad.[26] With this definition the last category includes fourth generation immigrants as well as people of a higher generation who still declare a specific European country of origin. In defining the country of origin we use the answer to the question: "*From what countries or part of the world did your ancestors come?*". If more than one country is indicated, the respondent is asked: "Which one of these countries do you feel closer to?". 79% percent of the sample can identify a main country of origin affiliation. One must be aware that relying on self reported ancestry has limitations, when more than one ethnicity is listed, a likely result of mixed marriages. Our choice has been to take the respondent at her words and we have assigned the ancestry she chose to identify as the main one in the GSS. Yet there may be heterogeneity within each ancestry-generation cell, due to different numbers of parents or grandparents from the country of origin chosen by the

unfortunately, is not available in the GSS (while it is in the World Value Survey). Neither is the importance of service to others, also commonly used.

[25] For other Southern and Eastern European countries and for the French we do not have enough observations to reliably estimate country-generation-cohort specific effects.

[26] See Algan and Cahuc (2010).

respondent as the main one. This potential drawback should be kept in mind. Our definition could, in principle, be made tighter by limiting our analysis to respondents who indicate only one country of ancestry. This, however, would reduce substantially the number of observations, as only 50% percent of the sample chooses just one ancestry. The decrease is particularly severe for the fourth and third generation, for which we have an average decrease of 85% and 65%, respectively. As this would lead to unreliable estimates, we will not pursue this option here.

### 3.2 Recovering Country of Origin Effects for Different Generations within a Single Dynasty

The way an individual perceives the world is shaped by the values and beliefs of his/her parents. The attitudes of one's parents were, in turn, shaped by their own parents. This implies that an individual's ancestral origin is an important factor determining his/her values and beliefs. In order to capture the extent to which someone's country of origin impacts his/her attitudes, we estimate a Probit model which includes indicator variables for one's ancestry.[27] We allow the effect of ancestry to depend upon the temporal "distance" from the country of origin. This distance is measured by whether the immigrant is first, second, third, or fourth or higher generation. Moreover, the ancestry effect will depend upon the birth cohort of an individual, since the cultural heritage brought by immigrants and transmitted to their descendants depends upon when they left the mother country to come to the US (we will also assume a 25 year interval between cohorts). We allow the effect of the country of origin to depend on generation and cohort in a multiplicative fashion, imposing as little restrictions as possible on the data. We will use these effects to chart the evolution of attitudes within the only complete "dynasty" we observe in our sample. More precisely, we estimate the following Probit model:

$$Pr(y_t^i = 1) = \sum_{o \in O} \sum_{g \in G} \sum_{c \in C} \beta_{o,g,c} \left( I_{(Origin^i = o)} \times I_{(Generation^i = g)} \times I_{(Cohort^i = c)} \right) + \theta X_t^i \quad (6)$$

where $y_t^i$ takes the value of 1 if a certain event has occurred for individual $i$ in wave $t$. $I_{(\,.\,)}$ are indicator functions that take the value of 1 if the condition in the subscript is satisfied, 0 otherwise. The sums are defined over three different sets: set $O$ includes all possible countries of origin as defined in Table 2; set $G$ includes each of the four possible generations of immigrants; set $C$ includes four groups of respondents – those born in the periods 1892-1916, 1917-1941, 1942-1966 and after 1967. The set of controls includes: income, education, mother's education, father's education, age, age$^2$, gender, number of children, marital status, work status, religion, regional indicators, and urbanization indicators, and year-of-the-survey dummies. Clearly variables such as income and education may be related to the country of origin: immigrants and descendants of people from different countries of origin, may, for instance, attribute different importance to

[27] Responses to each of the GSS questions are re-coded to produce a binary outcome (see Table 1). For a bit more than half the questions there is a gradation of responses. We have decided to treat all the questions in a uniform fashion and to use a simple and easily interpretable binary representation of the responses. In doing this we also follow a common practice in the literature that uses the GSS.

education. Yet, we prefer to define country of origin effects net of these factors, in an attempt to capture deeper cultural values and beliefs that go beyond personal characteristics and economic and educational circumstances. However, in the robustness section we also experiment with more limited sets of controls.[28] These individual controls are held constant when we compare changes of attitudes across different immigrants. Finally, note that we include survey-year effects common to all respondents to capture general variations of attitudes over time. Summarizing, the country-generation effect is based on the estimated value of $\beta_{o,g,c}$ with $o \in \{1,..,7\}$; $g \in \{1,..,4\}$; $c \in \{1892-1916, 1917-1941, 1942-1966, \geqslant 1967\}$. In order to simplify the notation we include in the subscript denoting cohorts only the initial year of the cohort grouping (e.g. 1892 instead of $1892-1916$, etc.)

Our sample includes responses of immigrants whose ancestors moved to the U.S. during different periods. For example, the ancestors of some of our respondents arrived with the large migration waves around the turn of the twentieth century, while the ancestors of others immigrated more recently. In order to avoid mixing dynasties of immigrants that started at different points in time, and hence brought with them different attitudes, in our empirical work we focus on the four generations of the only full "synthetic" dynasty of immigrants observable in our data – the one that starts with the first generation born between 1892 and 1916 and ending with the last generation being born after 1967. We assume that the cohort born between 1917 and 1941 contains the children of the first generation immigrants born between 1892 and 1916 and so on. The culture of the first generation of immigrants in our synthetic dynasty are captured by the country-generation-cohort specific effects estimated for the recently arrived immigrants born between 1892 and 1916, denoted by $\beta_{o,1,1892}$. Those for the second generation are those for the cohort born 25 years later, i.e. between 1917 and 1941, $\beta_{o,2,1917}$. Finally the third generation effects are captured by $\beta_{o,3,1942}$, and those of the fourth generation (or higher) by $\beta_{o,4,1967}$. As for many countries the GSS does not have many respondents who are both first generation and belong to the cohort of 1892-1916, in order to have enough observations for the first generation of each country, we assume that the first generation of the 1892-1916 cohort and of the 1917-1941 cohort are characterized by the same coefficient ($\beta_{o,1,1892} = \beta_{o,1,1917}$). In Table 3, Part 1 , we report, as an example, the number of observations for each country, generation and cohort for the respondents to the question about trust. In Part 2 of the table we summarize the number of observations available to identify the country-generation-cohort effects for the 1892-1916 dynasty (allowing for the effects of the first generation of the 1892-1916 and 1917-1941 cohorts to be identical).

Note that while avoiding mixing dynasties is very important, the results found for our specific full dynasty may not extend to other. In particular, recent waves of immigration feature origin countries that are very different from those of migrants who arrived in 1892-1916, and hence convergence patterns may also be different. Moreover, one should be aware that we have at our

[28] See also Algan and Cahuc (2007, 2010) and Giavazzi, Schiantarelli, and Serafinelli (2013). We also present results with two alternative sets of controls: one including only age, age squared, year of the survey, gender, regional indicators, education and income; the other more limited one also excludes education and income.

disposal only synthetic and not actual dynasties, that there is a degree of arbitrariness in the definition of higher generations, and that we have a limited number of observations for the first generation. In spite of the limitations of the data and of the structure one needs to impose on them, we believe that they provide a unique and useful insight on the evolution of cultural traits over multiple generations of immigrants.

### 3.3 Measuring Convergence in Cultural Attitudes

In this section we illustrate how we measure and assess whether or not there is convergence in the cultural attitudes of different generations of immigrants towards the norm set by the more established and dominant groups. We start by calculating the deviation of the attitude of a given respondent from the average attitude of the respondents considered to represent the dominant culture. For each of the countries of origin we define

$$\widetilde{\beta}_{(o,g,c)} = \beta_{(o,g,c)} - \beta_{(ave,4,c)} \tag{7}$$

where $\widetilde{\beta}_{o,g,c}$ represents the difference of the generation and cohort specific country-origin effect, $\beta_{o,g,c}$, from the norm ($\beta's$ here denote estimated values). To capture the multi-cultural nature of the U.S., we assume that the "norm" is represented by the weighted average of the attitudes of the fourth generation (or higher) of British, Irish, German, Italian, Polish and Scandinavian immigrants in our sample, $\beta_{ave,4,c}$.[29] We calculate the appropriate weights by using information from the 2000 U.S. Census about the ancestral composition of the non-foreign born population across different cohorts. Although we can obtain the cohort specific frequency, we do not have the information to make it cohort and generation specific. In the robustness section we will experiment with different definitions of the norm.[30]

To examine the experience of immigrants from different origins for the dynasty starting in the 1892-1916 period, we focus on two relationships. First, we compare $\widetilde{\beta}_{o,1,1892}$ to $\widetilde{\beta}_{o,2,1917}$, i.e. how the distance from the norm for members of the first generation of the dynasty compares to the distance from the norm for members of the second generation of the same dynasty. This relationship allows us to characterize the level of assimilation that occurs from the first to the second generation of immigrants of the same origin. We then compare $\widetilde{\beta}_{o,1,1892}$ to $\widetilde{\beta}_{o,4,1967}$ to

[29] We present results obtained using alternative definitions of the "norm" in the robustness section. One might also consider using a region-specific definition of the norm: e.g.Texan culture for immigrants that live in Texas, Californian for those that live in California, etc. Unfortunately data limitation prevent us from running this experiment.

[30] In our analysis we focus on the evolution in the country of origin cohort-generation specific effects. We recognize that there is heterogeneity in attitudes across individuals within each ethnicity and this is why we introduce controls in the Probit model. For a different approach in measuring the role of ethnicity as a determinant of culture that takes account of heterogeneity across individuals see Desmet et al. (2017) and Desmet and Wacziarg (2018).

study how the particular attitude of descendants changes from the first generation all the way to the fourth generation of the dynasty starting in 1892-1916, relative to the respective norms.[31]

We start by asking whether the absolute value of the distance from the norm decreases between the first and the second or between the first and the fourth generation for each country and then compute for each attitude the proportion of countries for which the distance has decreased. This methodology builds on and extends the approach proposed by in Algan, Bisin, Manning, and Verdier (2012).[32] However, whereas they focus on the changes between the first and second generation, we analyze the evolution of attitudes up to the fourth generation. Most importantly, we keep the dynasty constant – only considering the descendants of a "common original immigrant". This approach provides a rich, country of origin specific, picture of the process of cultural transmission, which is not contaminated by changes in attitudes of successive cohorts of immigrants.

It is useful to characterize the various patterns of convergence or non-convergence using a graph. Assume one plots the generation-1 deviation on the horizontal axis and the generation-4 deviation on the vertical axis (i.e. $\widetilde{\beta}_{o,1,1892}$ and $\widetilde{\beta}_{o,4,1967}$). We can partition the four quadrants in regions by drawing a 45 degree line and a 135 degree line going through the origin (see Figure 2a). Focusing on Quadrant I, with positive initial and final deviations from the norm, points between the x-axis and the 45 degree line represent *monotonic convergence from above*, in the sense that the deviation is larger in generation 1 than in generation 4, while those between the45 degree line and the y-axis capture *monotonic divergence from above*. Points between the (continuation of the) 45 degree line and the x-axis in Quadrant III represent *monotonic converge from below,* while points between the 45 degree line and the y-axis *monotonic divergence form below.* In Quadrant II, where the difference from the norm is first positive and then negative, points below the (continuation of the) 135 degree line are points of *divergent regression* and those above the line are points of *convergent regression*. In Quadrant IV, in which the difference relative to the norm is first negative then positive, the (continuation of) the 135 degree line separates points of *divergent leapfrogging* (above it) from those representing *convergent leapfrogging* (below the line). This graph is useful to understand how the pattern of convergence differs for each cultural trait and each country.

One can construct an overall index of convergence for each attitude by counting the proportion of countries for which the absolute distance from the norm has been cut between generation one and four. In terms of our Figure, this means computing the proportion of countries that fall in the *monotonic convergence from above* or *below*, and in the *convergent regression* and *convergent leapfrogging* regions. In other terms we are counting, in this case, the points outside the hourglass defined by the 45 and 135 degree lines through the origin that represent a decrease in the absolute

[31] One could also analyze the process of convergence between the first and third generation by comparing $\widetilde{\beta}_{o,1,1892}$ to $\widetilde{\beta}_{o,3,1942}$. We choose to focus on evolution between the first and fourth generation in order to allow as much time as possible for attitudes to evolve further, beyond the change that occurs between the first and second generation.

[32] See, in particular, Figure 1.4 on p. 25.

value of the distance from the norm going from the $1^{st}$ to the $4^{th}$ generation (see Figure A1 in Appendix 1 for a graphical summary of the observations for each attitude). Alternatively, we can do this for the $1^{st}$ and the $2^{nd}$ generations. We define the proportion of countries within these convergent region as $\pi_{45}$.

A possible drawback of $\pi_{45}$ is that it may not be a strict enough criterion. In particular it does not allow us to distinguish between slow-converging attitudes that feature country-generation effects close to the 45 degree line (or its reflection), and fast-converging ones clustered closer to the origin, along the y-axis. To address this concern we define $\pi_{22.5}$ as the proportion of countries situated between the x-axis and the 22.5 degree line (or its reflection). In other terms, we are now squeezing the hour-glass from above and count as convergent only those country-wave observations for which the absolute value of the distance from the norm in generation 1 has been cut at least in half by generation 4 (see Figure 2b). This is our preferred measure of convergence. One could use a somewhat tighter or looser criterion. As a robustness exercise, we will document in Section 7 that the ranking of attitudes obtained using the $\pi_{22.5}$ criterion is very similar to the one obtained when we require that the absolute value of the distance from the norm for generation 1 is cut by at least a third ($\pi_{30}$) or two thirds ($\pi_{15}$) by generation 4.

Note that this approach, particularly when using the $\pi_{45}$ criterion, is related to $\beta$ convergence as the latter focuses on whether the slope of the regression line of $\widetilde{\beta}_{o,4,1967}$ on $\widetilde{\beta}_{o,1,1892}$ is between zero and one (so that the regression line lies in the monotonic convergence region). Yet, it is less parametric, less exposed to the influence of outliers, and it allows for convergent leapfrogging and convergent regression as well.

We have also experimented using a different measure of the speed of convergence. More specifically, we again calculate, for each attitude, the absolute distance from the norm for the fourth and first generation. We then compute for a given attitude the median value across countries for each generation and take the difference between the two. This difference can be thought of as another synthetic measure of how quickly cultural convergence occurs between the first and fourth generation (the exercise is then repeated for the second generation, etc.). We think that these results (which are reported in Table 6 and discussed in the next section) are a useful addition to indices of convergence based on the percentage of countries that have cut the absolute distance from the norm by a certain amount.

## 4 Results

In this section we present our main empirical results, starting from those based on the proportion of converging countries. We start by calculating the percentage of countries whose distance from the norm in generation 4 is less than half of the distance displayed by their ancestor in generation 1. We use this fraction to quantify the convergence that occurs in a particular attitude (or group of attitudes) between the first and the fourth generation of the dynasty. As explained in the previous section, in our baseline results we define the "norm" as the weighted average of the

attitudes of the fourth (or higher) generation European immigrants in our sample. We compare the convergence that occurs by the fourth generation with that occurring between the first and the second generation.

After presenting our baseline results we will explore in the Robustness and Extensions section several robustness exercises, such as tightening or relaxing the convergence criterion, using a reduced set of controls in the Probit equation, and changing the definition of the norm. In the that section (see 5.4) we also present evidence on the strength of the relationship between attitudes in the country of origin and immigrants' attitudes across multiple generations. This last issue is different, although related, to the question whether or not attitudes converge to the norm. Moreover, it is an issue worth addressing because it has been studied by a number of authors in a context similar to ours, although with a focus limited to the second generation.[33]

### 4.1 Main Results

The main results are summarized in Table 4 for groups of attitudes and in Table 5 for individual attitudes and countries.[34] In Table 4 we sort attitudes by the main groups shown in Table 1: Cooperation, Family, Gender, Religion, etc.. We denote with $Gen4\ \pi_{22.5}$ the average across the attitudes in a given group of the fraction of convergent cases for each attitude. For example, 81% for "Cooperation" means that by the fourth generation ($Gen4\ \pi_{22.5}$) the initial gap for the three attitudes related to cooperation (*trust, fair and helpful*) on average has been cut at least in half in 81% of all countries of origin. In the next column we show the same statistics for convergence by the second generation ($Gen2\ \pi_{22.5}$), and in the third column, denoted by $\Delta$, the difference between the two. Finally, the last two columns contain bootstrapped 90% and 95% confidence intervals for $\Delta$.

In terms of our hour-glass convergence criterion, a number of common patterns emerge. First, whether a cultural trait can be considered persistent or not crucially depends upon whether one considers the change between the $1^{st}$ and $2^{nd}$ or the $1^{st}$ and $4^{th}$ generation. This point is very important: focusing only on the $2^{nd}$ generation, as the literature has done so far, would miss the greater convergence of a number of attitudes.

Attitudes toward cooperation are slow moving initially, but eventually converge. By generation 2 the initial gap in these attitudes has been cut at least in half in only 33% of all countries of origin. By generation 4 this number has risen to 81%, the largest percentage of convergent cases across all groups of attitudes. This suggests that while there is much to be gained in economic and social interaction from sharing attitudes towards cooperation – which is the reason why these attitudes eventually converge – it may take relatively long time for immigrants to realize

[33] See the discussion and references in the Introduction.

[34] Summary statistics for the estimated fixed effects from the probits, on which our analysis is based, are contained in Table A1 of the On Line Appendix 1. The table reports the median and standard deviation for each attitude of the country specific fixed effects for each generation of our synthetic dynasty. The resulting estimated deviations from the norm are reported in Table A2 and in Figures A1a and A1b.

this and change their attitudes. An alternative interpretation is that initially immigrants live in more segregated communities so that cooperating with others outside their community may be less of an issue. As immigrants disperse geographically, however, interacting with members of the majority becomes more likely and, hence, doing it efficiently more important. Whatever the reason, convergence eventually occurs in most cases. Limiting the analysis to what happens between the $1st$ and the $2nd$ generation would lead to incorrect conclusions on the evolution of attitudes towards cooperation. Note that the 95% bootstrapped confidence interval for $\Delta$ does not include zero: we can thus reject the hypothesis of no change between the second and fourth generation in the attitudes toward cooperation.

A similar pattern, although less pronounced, emerges on average for attitudes toward the family (as we shall see, however, there are differences across individual attitudes): by generation 4 the percentage of convergent cases for the family category is 67% , while it was 43% by generation 2. As for attitudes toward cooperation, the 95% confidence interval for $\Delta$ does not include zero. For gender roles too there is a sizeable change in the percentage of convergent cases (64% versus 43%), but the 95% confidence interval now includes zero. Other groups of attitudes, while changing somewhat in the first two generations – which is natural following the shock of being exposed to a new society – remain quite different across country of origin and do not move much after the $2nd$ generation. By generation 4 the percentage convergent cases is 57% for abortion and for the role of luck versus effort in determining social mobility, 43% for sexual behavior and views about the role of government, each essentially unchanged between $Gen2$ and $Gen4$. Summing up, the groups that converge more slowly by the fourth generation are those connected with general political views, moral values concerning sexuality and abortion, and religion.

Sorting attitudes in our eight groups, as we have done in Table 4, helps get an overall picture of how various types of attitudes evolve (if at all). Yet, there are (varying) degrees of heterogeneity within each group and the pace of convergence of individual attitudes, while more noisy, in some cases helps to better understand the mechanisms that may result in attitudes converging fast or slowly. The convergence of individual attitudes by generation 4 is shown in Table 5, which also contains information on convergence *by* country. The attitudes that converge less (with convergence proportions of less than 57%) by the fourth generation are those that describe political views: *helppoor* (government should improve the standard of living of the poor), and *polviews,* but also *eqwlth* (should income be equalized between rich and poor) is rather slow moving. Attitudes towards sexual morality (*premarsx, homosex),* as well as abortion without restrictions *(abany),* are also among the slowest to converge. Interestingly, when one qualifies the access to abortion (*abrisk:* abortion restricted to cases of risk for the mother's health, defects in the fetus, or rape) there appears to be faster convergence. Most of the attitudes towards religion are in the next slower group (with convergence proportions of 57%). There is instead heterogeneity among various family attitudes, with approval of sharing home with grown-up children (*aged*), frequency of evenings spent with relatives (*socrel)* and valuing children's independence *(thnkself)*

converging more slowly, while attitudes towards divorce (*divlaw*) being the single fastest moving attitude. [35] The slow convergence of *getahead (*work, help or luck as a source of social mobility) mirrors the slow convergence of general political attitudes and attitudes towards redistribution.

Among the attitudes that show the highest degree of convergence by generation 4 one finds all three attitudes about cooperation (*helpful, trust, and fair).* Interestingly, *trust* and *fair* are two of the slow moving attitudes when one focuses on the change between the first and second generation: for both attitudes by generation 2 the initial gap has been cut at least in half in only 14% of all countries of origin, while this percentage rises to 71% by generation 4 (it goes from 57% to 100% for the third attitude towards cooperation, *helpful*). It is interesting to note that while for most countries attitudes regarding trust become very close to the norm by the fourth generation, for two countries (Mexico and Italy) they remain considerably below the norm (See Figure A1 in Appendix 1). The group of converging attitudes also contains one attitude towards religion (*postlife),* which is somewhat puzzling. Interestingly, the attitudes towards gender roles are split, in terms of speed of convergence, between those that are related to the labor market versus those that capture the role of women in politics: *fechild* (whether a child suffers when the mother works) is fast converging, while *fepol (*suitability of women for politics) is slow converging. For instance, fourth generation descendants of Italian immigrants continue to display more conservative views about the role of women in politics but not in the labor market (see Figure A1). Similarly, descendants of Mexican immigrants display convergent behavior for *fechild* but not for *fepol*.

In Table 6 we report the results we obtain when we calculate for each attitude the absolute distance from the norm for the first and fourth generation, compute the median value across countries for each generation and take the difference between the two. This can be thought of as another synthetic measure of the speed of convergence between the first and fourth generation (the exercise is then repeated for the second generation, etc.). The rank correlation coefficient between the ranking using the percentage of convergent countries and the actual change in the median distance is .77 and the picture that emerges is very similar to that obtained when using the criterion based on the proportion of converging countries. This continuous measure allows us to finesse some of our conclusions. For instance, the decrease in the median value of the distance from the norm for *thnkself* and *obey* is very similar, and larger than the one for other family attitudes. The difference in the evolution of attitudes towards abortion obtained using the percentage of converging countries – with *abany* (no restrictions) moving definitely more slowly than *abrisk* (with restrictions) – is confirmed. This is also the case for the result that attitudes toward women work (*fechild*) adjust more quickly than those regarding the role of women in politics (*fepol*).

[35] Inglehart and Baker (2000), using the World Value Survey (WVS), suggest that economic development is associated with shifts away from absolute norms and values toward more rational, tolerant, trusting, and participatory ones. However, they argue that cultural change is path dependent and is affected by the broad religious and cultural heritage of a society. Notice that many of the values and attitudes that we identify as slow moving are considered by Inglehart and Baker (2000) as characteristics that distinguish preindustrial from industrial societies.

### 4.2 Discussion

The overall conclusions that emerge from analyzing both the 8 groups and the 24 individual attitudes seem largely consistent with the predictions of our model of cultural transmission (although a handful of individual attitudes, such as *postlife*, are not easy to rationalize). Lazear (1999) and Konya (2005), from which we borrow our model of child identity choice, emphasize that cultural assimilation is more likely the greater the gain from sharing a cultural trait with the majority and the greater the inefficiency of not doing so. Cavalli-Sforza (2001) also suggests that a trait is more likely to spread horizontally if it is beneficial (see also Tabellini (2008b)). Our simple model indeed captures and further clarifies this effect, allowing for a parents' socialization choice. In the model both the range of the initial size of the minority for which full assimilation is the steady state equilibrium, and the speed of assimilation in each period, increase with the net transaction gain. This mechanism seems to be at work with many of the attitudes in our sample that appear to converge. For instance, there is much to be gained in economic and social interactions from sharing attitudes towards cooperation and this comes through in our results, although it takes more than two generations to be able to observe the change.[36]

Within the gender group, the convergence of views regarding the cost of women working in terms of the quality of the relationship with their children can be explained by the large economic gains from having women participate in market work and the fact that subsequent generations of women have gradually learned about it.[37] Conversely, it is interesting that attitudes that have to do with women's role in politics *(fepol)* display lower convergence by generation 4. We should not be surprised by the mixed results on gender norms because, as we discussed above, the economic gains implied by different gender attitudes are quite different. Previous studies also found mixed results. Some authors (for instance, Goldin (2006) and Albanesi and Olivetti (2016)) emphasize that technological innovations and structural change accompanying economic development, as well as medical improvements, have had a powerful effect on gender roles in the labor market; instead, Alesina, Giuliano and Nunn (2013) find a persistent impact on today's gender norms of the use of the plough as far back as a few millennia, even after accounting for the other factors mentioned above.

It also makes sense, in the light of our model, that general political orientation, attitudes towards redistribution and the role of effort versus luck in achieving success (also a component of one's overall ideological view) converge more slowly as they do not confer a direct transactional advantage in dealing with other groups. Moreover, in a pluralistic and democratic society like

[36] The idea of attitudes towards cooperation as an important ingredient and lubricant of economic activity is a very old one and has received great attention recently. See, for instance, Fehr (2009) and the references therein on theoretical, econometric and experimental evidence on the consequences and determinants of trust. There is also an extensive literature on the role of schools in shaping attitudes towards cooperation. See, for instance, Algan, Cahuc and Shleifer (2013). Note that in deriving the country-generation effects we control for education of the respondent and of his/her parents.

[37] In our model we do not allow for learning. See, however, Fogli and Veldkamp (2011) and Fernandez (2013) for models of beliefs formation in which people update their views about the implications for children's welfare of women working outside the home on the basis of the experience of previous generations. These models are used to rationalize the S-shaped form of women labor force participation rate over time.

the US, differences in political and ideological views are perfectly legitimate and can persist over time. The empirical evidence on the evolution/persistence of attitudes towards redistribution is mixed: Alesina and Fuchs-Schuendeln (2007) study the consequences of German reunification and find that preferences concerning redistribution differed between East and West, and that East Germans' preferences converged towards those of West Germans after unification; Luttmer and Singhal (2011), instead, suggest that immigrants' preferences towards government intervention in redistribution still bear the hallmark of the country of origin. Our evidence is consistent with the results in the latter paper in the sense that attitudes towards government redistributive intervention (particularly as summarized by *helpoor*) and general political beliefs display slow convergence. The process of ideology formation and the mechanisms through which views concerning the role of government in redistributing income can persist over time and can differ across countries have been studied in a related vast literature: see, for instance, Piketty (1995), Alesina and Glazer (2004), Alesina and Angeletos (2005), Benabou and Tirole (2006), Benabou (2008), and, for reviews, Alesina and Giuliano (2011) and Benabou and Tirole (2016).

It is also understandable that attitudes towards sexuality, abortion, religion and some family attitudes should display slow convergence as it is plausible that these attitudes may imply large gains for the parents if the child maintains the minority trait and, conversely, a large cost for the child if she abandons her family's traditional values and beliefs.[38] Again, transactional economic gains are likely to be less important.

An interesting question is whether the probability that a cultural attitude converges or not depends upon how spread out across countries of origin was the distribution of the trait in the first generation. Here the arguments go both ways: countries that are far away from the norm may find getting closer to it very advantageous; on the other hand, it may be costly and difficult to do so and this may foster an attempt to maintain a separate identity with regard to a particular trait. In our data the median initial standard deviation of the faster moving attitudes is only slightly larger than the median standard deviation for the slower moving ones (.41 versus .39).[39] This reflects the fact that the correlation between the initial standard deviation and the percentage of countries converging is rather small, equal to .16. Thus the initial dispersion of traits among first generation immigrants regarding each attitude does not seem to play a role in the ensuing convergence in subsequent generations.

Our results have implications for the debate between the views that emphasize the assimilation of immigrants, versus those that highlight the preservation of a separate identity, and for the question whether the melting pot metaphor is an accurate description of immigrants' experience

[38] *S*ee Fernandez-Villaverde, Greenwood, and Guner (2014) and Greenwood and Gruner (2010) on modelling the evolution of sexual practices and attitudes. The Fernandez-Villaverde, Greenwood, and Guner (2014) analysis rationalizes why change in sexual attitudes may lag the change in sexual practices. See also Gruber and Hungerman (2008) on the evolution of church attendance in response of to economic influences such as changes in the opportunity cost of church-going following changes in shops' opening hours. Our church attendance variable, however, does not change any faster than other religious attitudes.

[39] The standard deviation here refers to the distance between country attitudes and the norm. Faster moving attitudes are defined as those with a convergence rate of 71% or higher and the slower moving ones those with convergence rates of 43% or lower.

in the US. We find that by the fourth generation, for all countries but one (*Poland*), the majority of cultural attitudes of descendants of European and Mexican immigrants has converged, consistently with *Assimilation Theory* (see the bottom row of Table 5 that reports the total fraction of convergent attitudes by the fourth generation for each country). However, contrary to the prediction of that theory, and consistently with *Multiculturalism,* descendants of immigrants from different countries of ancestry have maintained over several generations a degree of cultural distinctiveness along some traits. In other words, the temperature in the melting pot is hot, but not uniform throughout, as one would expect given the model of cultural transmission we have developed that points to the fact that the speed of convergence is likely to differ across attitudes. The reason is that parameters such as the transactional advantage that assimilation confers are likely to be heterogeneous across attitudes.

Are there interesting country specificities in the pattern of convergence? In addition to Great Britain, the country with the largest weight in defining the norm, Ireland and Germany show the highest number of converging attitudes. Poland is at the bottom with Mexico, Italy and Scandinavia. Which factors could explain the number of convergent attitudes by country? One would expect, on average, that in countries of origin in which the family is a weaker social institution, *direct* transmission of traits would be relatively less important or effective. This is captured in our model by the parameters representing the benefit to the parent from the child maintaining the original trait, and by the effectiveness of the socialization technology embodied in the portion of the child's switching cost related to the parent's educational efforts. To investigate the role of the family we use a measure of the strength of family ties proposed by Alesina and Giuliano (2010). This measure captures beliefs on the importance of the family in a person's life, the duties and responsibilities of parents and children, and the love and respect for one's own parents. The data come from answers to a set of World Value Service questions.[40] This measure yields the following ranking for our countries (from the weakest to the strongest ties): Germany, Scandinavia, UK, Ireland, Poland, Italy, Mexico. With the exception of Scandinavia, this ranking of family ties is almost the reverse of the ranking for the proportion of convergent attitudes: indeed the rank correlation coefficient is negative ($r = -.62$). This suggests that family strength plays an important role in reducing the speed of convergence of immigrants' attitudes to the prevailing norm. However, it is not the only factor. The ease to learn English may also matter for convergence to the norm. In our model this is captured by the distribution of the stochastic component of the child's switching costs. As a proxy for the ability to acquire English proficiency we use the average, for each country of origin, of the number of words (out of ten) of which $1^{st}$ generation immigrants can identify the meaning[41]. The rank correlation with the number of convergent attitudes for the countries in our sample is positive and equal to .43.

[40] See Section 2.1.2 for details and Figure 1 for the ranking of countries.

[41] The GSS includes a series of questions that identify the respondent's vocabulary ability.

Finally, the number of convergent attitudes by country is negatively correlated ($r = -.56$) with the measure of residential segregation used in Borjas 1995.[42] Although our model does not include a residential choice, we have seen that it can be tweaked to recognize that, because of geographic segregation, the probability for a member of the minority of encountering another member of the same minority may differ from the share of the minority in the population, provided the latter is treated as exogenously given. The message the model deliversin this case – albeit in a very reduced form – is that a high degree of segregation by ancestry is likely to contribute to perpetuating the culture of the country of origin and to a slowing down of the process of cultural integration. Our results broadly confirm this prediction.

## 5 Robustness and Extensions

In this section we discuss several robustness exercises. Are our results robust, for instance, to a change in the tightness of the convergence criterion? Are they robust to the menu of controls included in the Probit model used to measure the country-generation-cohort effects, or to changes in the definition of the norm to which attitudes converge? The answer to these questions, as we shall see in the next three sub-sections, is mostly yes.

Finally, we extend our analysis to a related, but quite distinct issue: how do the cultural attitudes of succeeding generations of immigrants relate to those of individuals who have not migrated and kept living in the country of origin? In particular, do we observe a weakening of the relationship as the temporal distance from the country of origin increases over generations? We will also ask how the attitudes of various generations of immigrants are related to those prevailing in the country of origin for the cohort from which the first generation of immigrants was drawn. Although the issue of distance from the contemporary or ancestral culture in the country of origin and the main question addressed in this paper – convergence to the prevailing norm in the country of immigration – are different, we address it since it has often been studied in this literature, in a context similar to ours.

### 5.1 Changing the Definition of the Convergence Region

In our baseline results we have measured convergence focusing, for each attitude, on the index we called $\pi_{22.5}$, which measures the proportion of countries that have cut the absolute value of the distance of generation 4 from the norm by at least half relative to generation 1. In Table A3 of Appendix 1 (available online) we present detailed results for the $4^{th}$ generation based on less or more stringent criteria for convergence: reducing that distance by any amount ($\pi_{45}$), by at least a third ($\pi_{30}$), and by at least two thirds ($\pi_{15}$). The (Spearman) rank correlation

[42] See Borjas (1995), Table 2. We use the measure based on the percentage of first and second generation immigrants in the neighborhood of the same ethnicity as a first-generation immigrant. Similar results are obtained using figures for the second generation.

coefficients between the proportions of converging cases for each attitude (by generation 4) in the baseline and those obtained using these alternative criteria are reported at the bottom of the table. Using $\pi_{30}$ or $\pi_{15}$, instead of $\pi_{22.5}$, leaves the ranking of the degree of convergence of the different groups of attitudes by and large unchanged. Correlation coefficients with the ranking in our baseline case for individual attitudes are also very high (in excess of 72%). Moreover, the conclusion that it is important to go beyond the second generation in assessing convergence also still holds. The correlation with the ranking obtained when using $\pi_{45}$ is instead smaller (.54) and the difference in convergence speed across groups less sharp (although cooperation remains the fastest convergent group). This is not surprising and, as we have already argued, we find convergence by any amount the least convincing criterion.

### 5.2 Dealing with Countries Close to the Norm

One may be concerned that it may be hard for countries that are already close to the norm to cut further their distance. We have addressed this issue in two ways. First, when using the percentage of converging countries for each attitude, we have classified countries that belong to the lowest decile of the proportional distance from the norm in the first generation (corresponding to approximately 7%), and do not and increase it in future generations, as having already converged. The results are reported in Table A4 and are very similar to those we have already obtained. For instance the rank correlation coefficient using the two criteria is .82.

### 5.3 Reducing the Set of Controls in the Probit Equation

The estimates presented in the main results section controlled for variables that capture the socioeconomic convergence of subsequent generations of immigrants since we wanted to know whether individuals with the same basic demographic characteristic, living in similar places, and with the same socioeconomic status, but from different ethnicities, converge to the norm. In other terms is there a process of convergence that goes beyond socio-economic convergence? However, we recognize the importance of asking whether there is convergence in attitudes, without controlling for socio-economic convergence. In Table A5a we report, therefore, results obtained limiting the set of common controls to include only age, age squared, year-of-the-survey dummy, gender, income, education, regional indicators, and urbanization indicators (excluding, therefore, mother's education, father's education, number of children, marital status, and work status). In table A5b we omit from this smaller list also income and education. The model is estimated on the same sample used to obtain the main results and the findings are quite similar to those obtained with a fuller set of control. The rank correlation coefficient with the main results is .63 for Table A5a and .59 for Table A5b and our conclusions remain largely unchanged, whatever the list of controls.

### 5.4 Changing the Definition of the Norm

In Table A6a we return to our baseline specification and experiment changing the definition of the norm. More specifically, instead of defining the norm as the weighted average of the attitudes of the fourth (or higher) generation European immigrants in our sample, we choose as reference point the fourth generation descendants of immigrants from Great Britain. The rank correlation coefficient with our original ranking is .57 and our conclusions remain largely the same. This should not be surprising since descendants of British immigrants represent a large share (around 40%) of the immigrants who are fourth generation (or higher). Our conclusions are also unchanged when we include Mexico in the calculation of the norm, together with the other European countries (see Table A6b). The correlation coefficient with the ordering in the basic specification is now 0.88.

### 5.5 Immigrants' Attitudes and Attitudes in the Country of Origin

When assessing the strength of the association between immigrants' culture and the culture of the country of ancestry – which, as we explained, is a question different but related to the one addressed in this paper – there are two possible ways to proceed. We could focus on the relationship of immigrants' attitudes with those of the *corresponding cohort* in the country of origin. Alternatively we could compare immigrants' attitudes with attitudes in the country of origin for the cohort to which the *first generation* of immigrants belonged and from which the various generations descend. In the former case the reference point is the "contemporary" (same cohort) culture. In the alternative it is the "ancestral" culture of the country of origin, that is the culture the founder of the dynasty brought with him/her when he/she first migrated to the US. We shall conduct both exercises for different generations of immigrants.

We measure attitudes in the countries of origin using the European Value Survey (EVS) and the World Value Survey (WVS) which ask very similar questions, some of which coincide – often are almost identical – to those asked in the GSS and used in our baseline results. The match between the two surveys is very close for the questions regarding some of the cultural attitudes we have used in our empirical work, such as *trust, attend, postlife,* and *homosex,* and a fairly close (but not perfect) for *pray, thnkself, obey, fechild, fework,* and *abany* (See Table A7). The match is not close for the remaining attitudes we have examined. We have pooled the EVS and WVS data for all the relevant countries for the periods matching those defined in our baseline model. In the first stage, we have estimated the coefficient of country-cohort specific dummies in a Probit model for each attitude, controlling for survey-year effects, age, age squared, gender, and marital status.[43] In the second stage we have then associated these country-cohort-specific effects with the data in each GSS survey, so that each individual has been matched with the culture in the country of origin of the cohort she/he belongs to. We have then estimated the Probit models for

[43] The results that follow are not sensitive to the choice of the controls.

each cultural attitude on the GSS data, as we did before, but replacing the origin-generation-cohort dummies with the time-varying and country-specific cultural proxies obtained in the first stage, interacted with generation dummies. We continue to control for all the individual specific variables used before and for common year effects. Essentially, we are assuming that the country of origin and cohort specific movements in culture for US immigrants are proportional to the cultural proxy estimated in the first stage, *and* that its effect may vary across generations. In particular, we are interested in assessing the significance of the generation-specific coefficients and whether the effect of the culture of origin decreases (or not) going from the $1^{st}$ to the $4^{th}$ generation. We have then repeated this exercise by matching to each respondent the country of origin specific effects of the cohort of first emigration immigrants, to capture the ancestral culture of the founder of each dynasty of immigrants**.**

The results for both experiments are reported in Table 7, Part 1 (same cohort), and Part 2 (cohort of dynasty founder). First, considering all attitudes, in seven out of nine cases the coefficients of the culture of the country of origin for the first generation are significant at conventional levels, whatever the reference point of the country of origin. The association is closer for the attitudes that bear a close correspondence in the actual question surveyed in the GSS and in the EVS-WVS. This emphasizes the fact that an imperfect match between the EVS-WVS and the GSS questions is likely to lead to underestimating the strength of the association with the culture of the country of origin. In four cases the association is significant for the second generation at the 5% level and for one case at the 10% level (or nearly so), both in Part 1 and in Part 2, although, in the case of *trust, attend, pray, fechild,* and *homosex,* there are differences in the significance level, depending upon the reference point. Most interestingly, from our point of view, the value of the generation specific coefficients decreases in most cases as we go from the first to higher generations, implying a weakening of the effect of the culture of the country of origin, whether contemporary or ancestral. For instance, in the case of *trust* the coefficients for all generations are always significant, but decrease (when the reference point is the corresponding generation in the country of origin) from .39 to .34, .26, .22 as we go from the $1^{st}$ to the $4^{th}$ generation. This means that, when assessing the strength of association with the culture of the country of origin across generations, it is important to go beyond the second generation to have a full picture, as it was the case when analyzing convergence.

When we compare attitudes of the same cohort (one living in the US, the other in the country of origin), a weakening of the association from the first to higher generations does not imply nor is implied by convergence to the norm in the US. For instance, differences in attitudes across immigrants of distinct ethnicity (the issue investigated in this paper) could persist, and still the attitudes of immigrants could drift away from those prevailing in the country from which their ancestors originally came. Alternatively, one's cultural traits may remain close to those of the country of origin, but convergence to the norm across generations may be observed because over time values across countries become more similar. Analogous considerations apply when we use, as reference point, the culture that the founder of the dynasty brought with him/her when he/she

first migrated to the US. In practice, a weakening of the association with the founder's ancestral culture is likely to be a precondition for convergence to the norm for successive generations of immigrants within a dynasty.

## 6 Conclusions

Are immigrants' values and beliefs deeply rooted in the culture of the country of origin, so that they persist relatively unchanged across generations, or do they change in response to the new economic and social environment and converge rather rapidly to the prevailing norm of the recipient country? Answering this question is an important step in addressing the more general problem of how persistent a society's values and beliefs are – an issue on which there is abundant disagreement. In this paper we have presented new evidence on this question by analyzing cultural attitudes of different generations of European and Mexican immigrants to the US, and we have provided a simple model to shed light and interpret the evidence on the speed of convergence.

Studying US immigrants we find that persistence is not the same across cultural traits. Some show a higher degree of convergence to the prevailing norm: this is true, for example, for attitudes towards cooperation (trustworthiness, helpfulness and fairness of others), towards the effect of women's work on the child-mother relationship, and some family attitudes, such as views on divorce. Other traits, instead, show a lower degree of convergence: for instance attitudes towards politics and redistribution, sexuality, abortion, religious values, and some family attitudes such as sharing home with grown-up children and frequency of evenings spent with relatives. A higher degree of convergence appears to characterize attitudes for which the benefits of assimilation are likely to be greater; instead, attitudes that are either characterized by lower benefits or for which direct transmission within the family is likely to be more important and effective show slower convergence.

Importantly we also find that one would not come to these conclusions if one limited the analysis to just the first two generations of immigrants, as the literature has so far mostly done. Focusing only on the first two generations biases the conclusion in favor of persistence. Finally, we show that persistence is country specific in the sense that the country from which one's ancestors came matters for the pattern of generational convergence (or lack thereof). The strength of family ties, the ability to learn English and residential segregation appear to be important factors in this respect.

The implication of our results for the debate about the "melting pot" is that for many-cultural traits and beliefs a melting-pot effect was certainly at work among immigrants. For other traits, however, descendants of immigrants from different countries of ancestry have maintained over several generations a degree of cultural distinctiveness. Thus, the temperature in the melting pot was hot, but not uniform throughout, as suggested by our model that emphasizes how the

effectiveness and importance of the socialization mechanism by parents and of the benefits from assimilation for their children is likely to vary across attitudes *and* countries.

Finally, one may ask whether the evidence provided in this paper has any relevance for the question concerning the likelihood of success of reforms designed to change practices within a country. Are such reforms doomed because a country's culture cannot be changed, or can they succeed because they can change cultural attitudes by altering incentives? This paper neither intends to, nor can provide an answer to this question. What we have shown, however, is that the large shock represented by the new social and economic environment faced by immigrants can eventually lead to a change in many cultural traits. We have also found that the process of change depends upon cultural characteristics of the country of origin, so that any answer is likely to be country specific. These issues are fertile ground for future research.

## 7 Tables and Figures

Table 1: List of Attitudes: Groups, Abbreviations, Descriptions

| | | |
|---|---|---|
| Group A – Cooperation | *trust* | can people be trusted or cannot be too careful? (y=1 for yes if $x_{GSS} = 1$) |
| | *fair* | will people take advantage of you? (y=1 for no if $x_{GSS} = 2$) |
| | *helpful* | people are mostly helpful or looking out for themselves (y=1 for yes if $x_{GSS} = 1$) |
| Group B – Government/Politics | *eqwlth* | government should equalize income between poor and rich (y=1 for yes if $x_{GSS} < 5$) |
| | *helppoor* | government should improve the standard of living of the poor (y=1 for yes if $x_{GSS} < 4$) |
| | *polviews* | political views (y=1 for liberal if $x_{GSS} < 4$) |
| Group C – Religion | *attend* | frequency of religious services attendance (y=1 for less often if $x_{GSS} < 5$) |
| | *pray* | frequency of prayer (y=1 for less often if $x_{GSS} > 4$) |
| | *reliten* | intensity of religious affiliation (y=1 for not strong if $x_{GSS} > 1$) |
| | *postlife* | belief in life after death (y=1 for no if $x_{GSS} = 2$) |
| | *prayer* | approval of prayer in public schools (y=1 for disapprove if $x_{GSS} = 2$) |
| Group D – Family | *thnkself* | independence of a child is highly important quality (y=1 for important if $x_{GSS} < 3$) |
| | *obey* | obedience of a child is a highly important quality (y=1 for not important if $x_{GSS} > 2$) |
| | *pillok* | birth control available to teenagers without parental consent (y=1 for ok if $x_{GSS} < 3$) |
| | *aged* | approval of sharing home with grown children (y=1 for disapproval if $x_{GSS} > 1$) |
| | *divlaw* | should divorce be easier? (y=1 for yes if $x_{GSS} = 1, 3$) |
| | *socrel* | frequency of social evenings with relatives (y=1 for less often if $x_{GSS} > 3$) |
| Group E – Gender Roles | *fechild* | working mother can have a good relationship with children (y=1 for yes if $x_{GSS} < 3$) |
| | *fepol* | women not suited for politics (y=1 for no if $x_{GSS} = 2$) |
| Group F – Abortion | *abany* | approval of abortion for any reason (y=1 for yes if $x_{GSS} = 1$) |
| | *abrisk* | approval of abortion for health/defect/rape reasons (y=1 for yes if $x_{GSS} = 0$) |
| Group G – Sexual Behavior | *premarsx* | approval of premarital sex (y=1 for yes if $x_{GSS} = 4$) |
| | *homosex* | approval of same-sex sexual relations (y=1 for yes if $x_{GSS} > 2$) |
| Group H – Mobility/Success | *getahead* | work, help, luck as a source of social mobility (y=1 for work if $x_{GSS} = 1$) |

Notes: The responses from the GSS survey have been recoded to have a binary outcome. $y$ denotes the indicator variable in the Probit. Variable *abrisk* does not exist in the GSS. $abrisk = abhlth \cup abrape \cup abdefect$. $x_{GSS}$ denotes the numerical value of the answers to the GSS questions, as ome allow for a gradation of response.

Table 2: Countries and Country Groups

| Country Group | Countries |
|---|---|
| British origin (GB) | England, Wales, Scotland |
| German origin (GER) | Germany |
| Irish origin (IRE) | Ireland |
| Italian origin (ITA) | Italy |
| Polish origin (POL) | Poland |
| Scandinavian origin (SCA) | Denmark, Finland, Sweden, Norway |
| Mexican origin (MEX) | Mexico |

Table 3: Number of Respondents for the Question on Trust by Origin, Cohort, and Generation

| *Part 1*: | Cohort 1892-1916 | | | | Cohort 1917-1941 | | | | Cohort 1942-1966 | | | | Cohort 1967+ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gen1 | Gen2 | Gen3 | Gen4 | Gen1 | Gen2 | Gen3 | Gen4 | Gen1 | Gen2 | Gen3 | Gen4 | Gen1 | Gen2 | Gen3 | Gen4 |
| GER | 13 | 71 | 60 | 118 | 46 | 78 | 302 | 632 | 66 | 87 | 345 | 1,579 | 29 | 38 | 57 | 536 |
| POL | 13 | 48 | 4 | 1 | 14 | 81 | 59 | 14 | 26 | 30 | 207 | 81 | 6 | 7 | 17 | 62 |
| SCA | 12 | 57 | 15 | 4 | 10 | 72 | 124 | 71 | 16 | 28 | 183 | 307 | 6 | 3 | 17 | 112 |
| IRE | 8 | 33 | 28 | 121 | 11 | 53 | 158 | 493 | 26 | 44 | 233 | 1,153 | 11 | 19 | 48 | 445 |
| ITA | 20 | 54 | 3 | 1 | 37 | 180 | 74 | 13 | 37 | 86 | 387 | 173 | 7 | 28 | 71 | 186 |
| GB | 21 | 43 | 49 | 237 | 59 | 82 | 123 | 1,017 | 69 | 83 | 166 | 1,501 | 21 | 17 | 25 | 420 |
| MEX | 2 | 3 | 0 | 3 | 27 | 45 | 13 | 12 | 151 | 110 | 86 | 73 | 263 | 165 | 42 | 76 |

| *Part 2:* | Dynasty 1892-1916 | | | |
|---|---|---|---|---|
| | Gen1 | Gen2 | Gen3 | Gen4 |
| GER | 59 | 78 | 345 | 536 |
| POL | 27 | 81 | 207 | 62 |
| SCA | 22 | 72 | 183 | 112 |
| IRE | 19 | 53 | 233 | 445 |
| ITA | 57 | 180 | 387 | 186 |
| GB | 80 | 82 | 166 | 420 |
| MEX | 29 | 45 | 86 | 76 |

Notes: In part 2 we assume that of the first generation of the 1892-1916 and 1917-1941 cohort share the same attitude towards trust.

Table 4: Convergence of Cultural Attitudes (by Groups): Comparing Generation 4 and 2

| | | Gen 4 $\pi_{22.5}$ | Gen 2 $\pi_{22.5}$ | $\triangle$ | 90% CI | 95% CI |
|---|---|---|---|---|---|---|
| Group A - Cooperation | *trust fair helpful* | 81% | 33% | 48% | (14%, 48%) | (10%, 52%) |
| Group B - Government | *eqwlth helppoor polviews* | 38% | 43% | -5% | (0%, 43%) | (0%, 43%) |
| Group C - Religion | *attend pray reliten postlife prayer* | 60% | 46% | 14% | (3%, 34%) | (0%, 37%) |
| Group D - Family | *thnkself obey pillok aged divlaw socrel* | 67% | 43% | 24% | (10%, 38%) | (7%, 40%) |
| Group E - Gender Roles | *fechild fepol* | 64% | 43% | 21% | (-7%, 43%) | (-7%, 50%) |
| Group F - Abortion | *abany abany* | 57% | 50% | 7% | (-7%, 36%) | (-7%, 43%) |
| Group G - Sexual Behavior | *premarsx homosex* | 43% | 43% | 0% | (0%, 43%) | (-7%, 50%) |
| Group H - Mobility/Success | *getahead* | 57% | 57% | 0% | (-29%, 43%) | (-29%, 57%) |

Notes: Convergence is achieved when the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 4 or 2 ($\pi_{22.5}$ criterion). Gen 4 $\pi_{22.5}$ denotes the average percentage of convergent cases by generation 4 within each group, and Gen 2 $\pi_{22.5}$ by generation 2. $\triangle$ denotes the difference in the percentage of convergent cases between generations 4 and generation 2. The last two columns report the bootstrapped 90% and 95% confidence intervals for $\triangle$, based on 500 replications estimating the Probit equation, based on stratified sampling with replacement in the country-generation-cohort cells.

Table 5: Convergence by Each Cultural Attitude and Country

| | | Gen 4 $\pi_{22.5}$ | GER | POL | SCA | IRE | ITA | GB | MEX |
|---|---|---|---|---|---|---|---|---|---|
| Group A - Cooperation | *trust* | 71% | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| | *fair* | 71% | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| | *helpful* | 100% | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Group B - Government | *eqwlth* | 57% | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
| | *helppoor* | 29% | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| | *polviews* | 29% | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Group C - Religion | *attend* | 57% | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| | *pray* | 57% | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| | *reliten* | 57% | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| | *postlife* | 71% | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| | *prayer* | 57% | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Group D - Family | *thnkself* | 57% | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| | *obey* | 71% | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| | *pillok* | 71% | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| | *aged* | 43% | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| | *divlaw* | 100% | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | *socrel* | 57% | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| Group E - Gender Roles | *fechild* | 71% | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| | *fepol* | 57% | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| Group F - Abortion | *abany* | 43% | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| | *abany* | 71% | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| Group G - Sexual Behavior | *premarsx* | 43% | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| | *homosex* | 43% | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| Group H - Mobility/Success | *getahead* | 57% | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| | | | 79% | 38% | 54% | 67% | 58% | 67% | 58% |

Notes: The figures in the table represent the number of times we observe convergence for each country and each attitude (1 denotes convergence). Convergence is achieved when the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 4 ($\pi_{22.5}$ criterion). Gen 4 $\pi_{22.5}$ denotes here the percentage of convergence cases for each attitude.

Table 6: A Different Measure of Convergence: Change in the Median Absolute Deviation

| | | Median (Dev G2 – Dev G1) | Median (Dev G4 – Dev G1) | Group Average |
|---|---|---|---|---|
| Group A - Cooperation | *trust* | -0.059 | -0.160 | -0.320 |
| | *fair* | 0.034 | -0.440 | |
| | *helpful* | -0.262 | -0.352 | |
| Group B - Government | *eqwlth* | -0.036 | -0.151 | -0.08 |
| | *helppoor* | -0.153 | -0.075 | |
| | *polviews* | 0.026 | -0.007 | |
| Group C - Religion | *attend* | -0.012 | -0.131 | -0.180 |
| | *pray* | -0.120 | -0.062 | |
| | *reliten* | -0.154 | -0.281 | |
| | *postlife* | -0.240 | -0.344 | |
| | *prayer* | -0.045 | -0.071 | |
| Group D - Family | *thnkself* | -0.328 | -0.326 | -0.190 |
| | *obey* | 0.031 | -0.315 | |
| | *pillok* | 0.099 | -0.117 | |
| | *aged* | -0.121 | -0.102 | |
| | *divlaw* | 0.053 | -0.113 | |
| | *socrel* | -0.070 | -0.145 | |
| Group E - Gender Roles | *fechild* | -0.452 | -0.431 | -0.270 |
| | *fepol* | -0.132 | -0.109 | |
| Group F - Abortion | *abany* | -0.004 | -0.006 | -0.200 |
| | *abany* | -0.274 | -0.403 | |
| Group G - Sexual Behavior | *premarsx* | -0.106 | -0.039 | -0.030 |
| | *homosex* | 0.0325 | -0.030 | |
| Group H - Mobility/Success | *getahead* | -0.205 | -0.130 | -0.130 |

Notes: The table contains the median value across countries of the change in the deviation from the norm between generation 1 and generation 4 or 2.

Table 7: Relationship between Attitudes in the Country of Origin and Attitudes of US Immigrants across Generations

Part 1: Relationship with contemporary attitudes

| Variable | *trust* | *attend* | *pray* | *postlife* | *thnkself* | *obey* | *fechild* | *abany* | *homosex* |
|---|---|---|---|---|---|---|---|---|---|
| $ContemporaryCulture_o \times I_{(g=1)}$ | 0.39 | 0.31 | 0.39 | 0.77 | 0.42 | 0.36 | 0.18 | 0.00 | 0.09 |
| | (5.12) | (4.47) | (4.91) | (3.55) | (3.83) | (2.04) | (3.76) | (-0.08) | (1.81) |
| $ContemporaryCulture_o \times I_{(g=2)}$ | 0.34 | 0.10 | 0.17 | 0.08 | 0.11 | 0.08 | 0.10 | -0.04 | 0.11 |
| | (4.96) | (1.94) | (2.49) | (0.65) | (1.36) | (0.59) | (2.61) | (-0.96) | (2.41) |
| $ContemporaryCulture_o \times I_{(g=3)}$ | 0.26 | 0.10 | 0.05 | 0.22 | 0.02 | 0.08 | 0.08 | 0.01 | 0.03 |
| | (4.25) | (3.39) | (0.97) | (2.91) | (0.24) | (1.05) | (2.22) | (0.39) | (0.79) |
| $ContemporaryCulture_o \times I_{(g=4)}$ | 0.22 | -0.02 | 0.04 | -0.05 | -0.02 | -0.14 | 0.10 | 0.03 | 0.09 |
| | (3.59) | (-1.00) | (1.16) | (-1.08) | (-0.28) | (-2.90) | (2.63) | (0.86) | (2.26) |

Part 2: Relationship with ancestral attitudes

| Variable | *trust* | *attend* | *pray* | *postlife* | *thnkself* | *obey* | *fechild* | *abany* | *homosex* |
|---|---|---|---|---|---|---|---|---|---|
| $AncestralCulture_o \times I_{(g=1)}$ | 0.52 | 0.35 | 0.41 | 0.66 | 0.56 | 0.38 | 0.21 | 0.08 | 0.14 |
| | (4.72) | (4.91) | (4.93) | (3.07) | (3.65) | (2.06) | (2.52) | (1.17) | (1.58) |
| $AncestralCulture_o \times I_{(g=2)}$ | 0.49 | 0.20 | 0.21 | 0.08 | 0.13 | 0.09 | 0.08 | 0.05 | 0.11 |
| | (4.90) | (3.34) | (2.53) | (0.63) | (1.22) | (0.51) | (1.42) | (0.85) | (1.52) |
| $AncestralCulture_o \times I_{(g=3)}$ | 0.32 | 0.09 | 0.04 | 0.10 | -0.01 | 0.27 | 0.04 | 0.05 | 0.02 |
| | (3.71) | (2.16) | (0.64) | (1.11) | (-0.18) | (1.60) | (0.95) | (0.93) | (0.45) |
| $AncestralCulture_o \times I_{(g=4)}$ | 0.31 | -0.12 | 0.02 | -0.09 | 0.02 | -0.07 | 0.02 | 0.09 | 0.10 |
| | (3.22) | (-2.89) | (0.37) | (-1.10) | (0.36) | (-0.41) | (0.62) | (1.62) | (2.04) |

Notes: $ContemporaryCulture_o$ denotes the culture of the corresponding cohort of the country of origin. $AncestralCulture_o$ denotes the culture of the cohort from the country of origin which originates the dynasty which the immigrant belongs to. Generation specific coefficients are reported. $z$ statistics in parentheses.

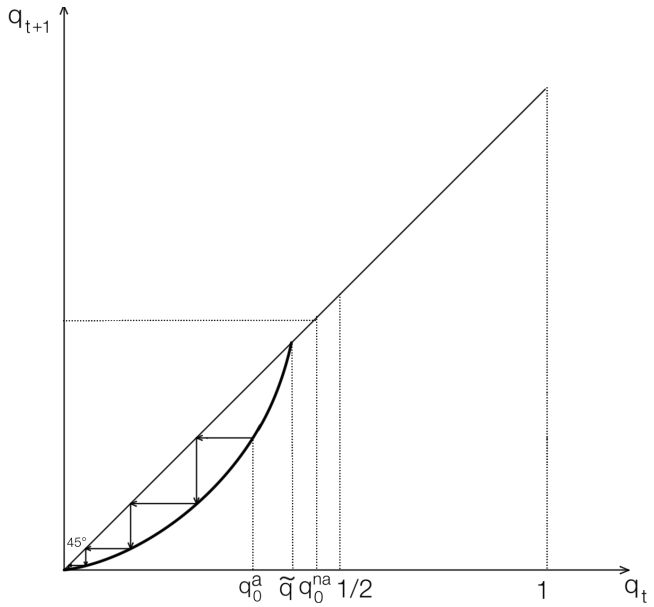


Fig. 1a: Dynamics and Equilibria: Full Assimilation and Non-assimilation Equilibrium

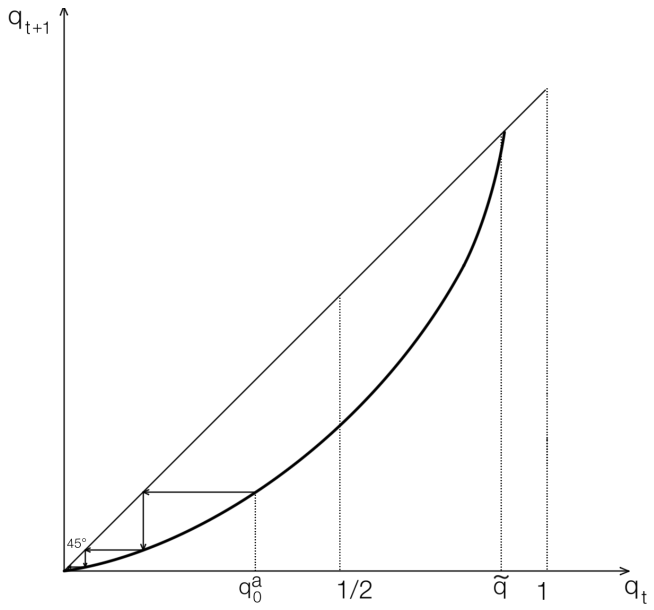


Fig. 1b: Dynamics and Equilibria: Only Full Assimilation Equilibrium

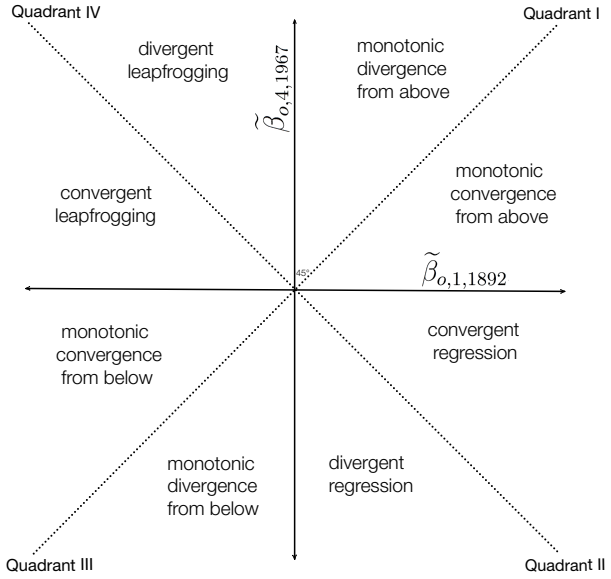


Fig. 2a: Generational Convergence and Non-convergence Regions (by type)

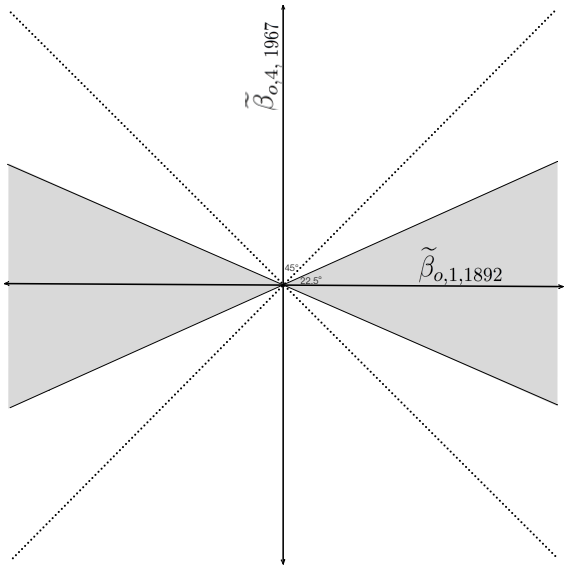


Fig. 2b: Convergence Region Implied by the $22.5^o$ Cut-off Rule

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## Appendix 1: Robustness (for online publication only)

Table A1: Descriptive Statistics for Country-Generation Fixed Effects for Each Cultural Attitude

| | | Gen1 | | Gen2 | | Gen3 | | Gen4 | |
|---|---|---|---|---|---|---|---|---|---|
| Group A - Cooperation | *trust* | -1.89 | (0.78) | -1.81 | (0.36) | -1.61 | (0.17) | -1.48 | (0.21) |
| | *fair* | -0.66 | (0.41) | -0.61 | (0.39) | -0.61 | (0.17) | -0.50 | (0.11) |
| | *helpful* | -0.90 | (0.57) | -0.96 | (0.30) | -0.88 | (0.17) | -0.88 | (0.09) |
| Group B - Government | *equlth* | 1.86 | (0.88) | 1.93 | (0.24) | 1.85 | (0.08) | 1.87 | (0.13) |
| | *helppoor* | 2.18 | (0.26) | 2.09 | (0.07) | 2.12 | (0.23) | 2.02 | (0.17) |
| | *polviews* | -1.02 | (0.34) | -0.97 | (0.24) | -0.68 | (0.08) | -0.68 | (0.11) |
| Group C - Religion | *attend* | 1.50 | (0.34) | 1.69 | (0.26) | 1.91 | (0.14) | 2.01 | (0.19) |
| | *pray* | 0.06 | (0.48) | -0.15 | (0.23) | -0.30 | (0.13) | -0.21 | (0.26) |
| | *reliten* | 0.55 | (0.42) | 0.43 | (0.17) | 0.57 | (0.12) | 0.56 | (0.13) |
| | *postlife* | 0.13 | (0.36) | -0.18 | (0.16) | -0.24 | (0.21) | -0.30 | (0.20) |
| | *prayer* | 0.88 | (0.39) | 1.12 | (0.27) | 0.76 | (0.13) | 0.96 | (0.16) |
| Group D - Family | *thnkself* | -0.52 | (0.52) | -0.04 | (0.32) | 0.00 | (0.12) | 0.03 | (0.18) |
| | *obey* | -0.48 | (0.30) | 0.04 | (0.29) | 0.19 | (0.12) | -0.08 | (0.13) |
| | *pillok* | 0.91 | (0.37) | 0.78 | (0.33) | 0.86 | (0.10) | 0.85 | (0.10) |
| | *aged* | -0.87 | (0.42) | -1.01 | (0.37) | -1.09 | (0.13) | -0.71 | (0.19) |
| | *divlaw* | 0.40 | (0.33) | 0.09 | (0.23) | 0.41 | (0.12) | 0.36 | (0.10) |
| | *socrel* | 0.75 | (0.27) | 0.34 | (0.22) | 0.55 | (0.11) | 0.45 | (0.14) |
| Group E - Gender Roles | fechld | -1.55 | (0.56) | -0.93 | (0.17) | -0.85 | (0.11) | -0.99 | (0.08) |
| | *fepol* | 0.45 | (0.17) | 0.14 | (0.22) | 0.54 | (0.11) | 0.31 | (0.09) |
| Group F - Abortion | *abany* | 0.22 | (0.37) | 0.31 | (0.22) | 0.35 | (0.07) | 0.18 | (0.26) |
| | *abany* | -0.40 | (0.49) | -0.37 | (0.18) | -0.27 | (0.07) | -0.31 | (0.09) |
| Group G - Sexual Behavior | *premarsx* | 0.63 | (0.43) | 0.44 | (0.17) | 0.81 | (0.09) | 0.67 | (0.14) |
| | *homosex* | -1.26 | (0.65) | -1.42 | (0.34) | -0.94 | (0.10) | -1.12 | (0.18) |
| Group H - Mobility/Success | *getahead* | -0.12 | (0.23) | 0.13 | (0.19) | -0.03 | (0.24) | 0.14 | (0.20) |

Notes: The table lists for each attitude the median and standard deviation (in parenthesis) for the country specific fixed effects for each generation of our synthetic dynasty.

Table A2: Deviation from the Norm by Country, Attitude and Generation

| | trust | fair | helpful | eqwlth | helppoor | polviews | attend | pray | religten | postlife | prayer | thnkself | obey | pillok | aged | divlaw | socrel | fechld | fepol | abany | abrisk | premarsx | homosex | getahead |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GER gen 1 | 0.137 | 0.501 | 0.244 | 0.181 | -0.350 | -0.002 | 0.180 | 0.113 | 0.291 | 0.594 | 0.163 | -0.715 | 0.112 | -0.324 | -0.046 | -0.028 | -0.151 | -0.624 | 0.148 | 0.135 | 0.364 | 0.268 | -0.117 | -0.279 |
| GER gen 2 | -0.401 | -0.055 | -0.452 | 0.371 | 0.103 | -0.047 | -0.043 | 0.056 | -0.079 | -0.028 | -0.118 | 0.096 | 0.365 | -0.110 | 0.237 | 0.080 | -0.140 | -0.001 | -0.016 | -0.238 | -0.089 | -0.161 | -0.208 | -0.007 |
| GER gen 3 | -0.074 | -0.069 | 0.012 | 0.054 | -0.150 | -0.088 | -0.079 | -0.029 | -0.129 | -0.146 | 0.027 | 0.025 | 0.224 | -0.020 | 0.003 | 0.058 | 0.024 | 0.009 | -0.105 | -0.045 | -0.010 | 0.116 | 0.016 | 0.104 |
| GER gen 4 | 0.052 | 0.045 | -0.010 | -0.030 | 0.002 | -0.098 | -0.048 | 0.050 | -0.010 | -0.063 | 0.092 | -0.083 | -0.111 | 0.054 | 0.036 | 0.008 | -0.057 | -0.005 | -0.039 | -0.056 | -0.038 | -0.005 | -0.128 | 0.131 |
| POL gen 1 | -0.364 | -0.056 | -0.573 | 0.109 | 0.503 | -0.140 | -0.336 | 0.132 | -0.160 | 0.523 | -0.090 | -0.499 | -0.478 | 0.204 | -0.539 | 0.967 | 0.072 | -0.475 | 0.433 | -0.018 | -0.709 | 0.120 | 1.269 | -0.339 |
| POL gen 2 | -0.181 | -0.203 | -0.006 | 0.177 | 0.050 | -0.167 | -0.324 | -0.052 | -0.288 | 0.032 | 0.260 | -0.075 | 0.571 | 0.380 | -0.369 | -0.196 | 0.002 | 0.023 | -0.231 | 0.291 | 0.163 | -0.421 | -0.225 | -0.232 |
| POL gen 3 | -0.166 | -0.124 | -0.088 | 0.069 | -0.009 | -0.005 | -0.161 | 0.136 | 0.002 | 0.197 | -0.149 | 0.064 | 0.230 | -0.037 | -0.003 | 0.121 | -0.162 | 0.150 | -0.086 | 0.154 | 0.006 | 0.218 | 0.177 | -0.281 |
| POL gen 4 | 0.086 | 0.060 | -0.111 | 0.209 | -0.263 | 0.133 | 0.434 | 0.469 | -0.082 | 0.372 | 0.187 | -0.173 | -0.136 | -0.190 | 0.436 | 0.243 | 0.060 | -0.044 | -0.003 | -0.432 | -0.112 | 0.113 | 0.127 | 0.413 |
| SCA gen 1 | 1.792 | 0.454 | 0.482 | -0.832 | 0.178 | -0.021 | -0.064 | 0.151 | 0.036 | 0.450 | 0.153 | 0.017 | 0.004 | 0.069 | -0.158 | 0.117 | 0.449 | 0.934 | 0.495 | 0.055 | 0.408 | 0.883 | 0.611 | -0.399 |
| SCA gen 2 | 0.002 | 0.488 | 0.132 | 0.248 | -0.064 | -0.124 | 0.059 | 0.030 | -0.091 | 0.209 | 0.156 | 0.280 | -0.160 | -0.169 | -0.036 | -0.186 | 0.095 | 0.117 | -0.362 | 0.051 | 0.299 | -0.363 | -0.489 | 0.166 |
| SCA gen 3 | 0.108 | 0.076 | 0.017 | -0.080 | 0.177 | 0.063 | 0.099 | -0.090 | 0.099 | 0.139 | -0.200 | 0.020 | 0.109 | -0.088 | -0.163 | -0.032 | 0.053 | 0.121 | -0.019 | 0.094 | 0.157 | -0.001 | 0.136 | 0.189 |
| SCA gen 4 | 0.064 | 0.014 | -0.130 | 0.195 | 0.210 | 0.034 | -0.081 | 0.329 | 0.073 | 0.062 | 0.113 | 0.195 | 0.108 | 0.020 | 0.229 | 0.045 | -0.304 | 0.017 | -0.070 | 0.059 | 0.005 | -0.127 | -0.231 | 0.028 |
| IRE gen 1 | 0.498 | 0.575 | 0.280 | 0.988 | 0.116 | 0.165 | -0.762 | -0.646 | -0.770 | -0.221 | -0.355 | 0.054 | -0.530 | 0.666 | 0.715 | 0.117 | -0.115 | 0.010 | 0.198 | -0.738 | -0.653 | -0.104 | -0.715 | -0.072 |
| IRE gen 2 | 0.604 | 0.481 | 0.123 | -0.103 | 0.021 | 0.308 | -0.156 | -0.327 | -0.345 | 0.036 | 0.187 | 0.495 | 0.055 | -0.537 | -0.290 | -0.241 | -0.334 | 0.256 | -0.288 | 0.092 | -0.115 | -0.076 | -0.080 | 0.053 |
| IRE gen 3 | -0.110 | 0.059 | 0.192 | 0.059 | 0.119 | 0.111 | -0.008 | -0.233 | -0.101 | -0.067 | -0.119 | 0.191 | 0.156 | -0.009 | -0.176 | 0.084 | 0.040 | 0.111 | 0.055 | 0.024 | 0.027 | 0.073 | 0.326 | 0.165 |
| IRE gen 4 | 0.058 | -0.096 | -0.016 | 0.098 | 0.099 | 0.113 | 0.142 | 0.081 | -0.021 | 0.031 | 0.046 | 0.103 | 0.215 | 0.110 | -0.095 | 0.013 | 0.090 | 0.128 | 0.102 | -0.020 | 0.028 | 0.066 | 0.135 | -0.062 |
| ITA gen 1 | -0.402 | -0.613 | -1.031 | -1.751 | 0.070 | -0.072 | -0.378 | 0.132 | -0.494 | 0.515 | -0.719 | -1.481 | -0.500 | -0.013 | -0.481 | 0.203 | 0.539 | -0.560 | 0.124 | -0.243 | -0.049 | 0.198 | -0.324 | -0.461 |
| ITA gen 2 | -0.343 | -0.592 | -0.449 | -0.023 | 0.098 | 0.041 | -0.176 | -0.155 | -0.141 | 0.348 | 0.058 | -0.420 | -0.235 | 0.341 | -0.298 | 0.206 | -0.223 | -0.256 | 0.084 | 0.023 | -0.033 | -0.006 | -0.357 | -0.131 |
| ITA gen 3 | -0.244 | -0.231 | -0.076 | -0.018 | 0.132 | 0.026 | 0.069 | -0.070 | 0.008 | -0.181 | 0.114 | 0.027 | 0.151 | 0.095 | 0.105 | 0.033 | -0.046 | -0.158 | 0.042 | 0.036 | 0.077 | 0.111 | 0.084 | -0.236 |
| ITA gen 4 | -0.241 | -0.126 | -0.067 | -0.008 | -0.127 | -0.066 | 0.155 | -0.123 | 0.200 | 0.172 | -0.295 | 0.073 | -0.086 | -0.013 | -0.042 | 0.082 | -0.029 | -0.012 | -0.169 | 0.419 | 0.177 | 0.240 | 0.299 | -0.158 |
| GB gen 1 | -0.157 | 0.096 | 0.185 | -0.111 | 0.251 | -0.110 | 0.110 | 0.417 | 0.344 | 0.129 | -0.079 | -0.345 | 0.082 | 0.591 | -0.041 | 0.185 | 0.316 | -0.039 | 0.374 | 0.435 | 0.034 | -0.059 | 0.011 | 0.206 |
| GB gen 2 | -0.310 | 0.154 | -0.291 | 0.075 | 0.098 | -0.086 | 0.189 | 0.274 | 0.190 | 0.334 | 0.139 | -0.072 | -0.113 | -0.059 | 0.025 | -0.052 | -0.124 | 0.172 | -0.241 | 0.136 | -0.209 | 0.014 | -0.064 | -0.002 |
| GB gen 3 | 0.243 | 0.243 | 0.154 | 0.008 | 0.099 | 0.167 | 0.019 | -0.008 | -0.032 | 0.160 | -0.228 | 0.032 | -0.056 | 0.217 | -0.252 | 0.016 | 0.024 | 0.170 | 0.118 | 0.112 | 0.043 | 0.029 | 0.168 | -0.136 |
| GB gen 4 | -0.014 | 0.036 | 0.063 | -0.068 | 0.006 | 0.014 | -0.116 | -0.140 | -0.040 | -0.080 | -0.034 | -0.012 | 0.013 | -0.056 | -0.062 | -0.073 | 0.043 | -0.047 | 0.044 | -0.026 | -0.025 | -0.092 | -0.047 | -0.076 |
| MEX gen 1 | -0.314 | 0.211 | -0.560 | 0.260 | 0.285 | 0.817 | -0.518 | -0.879 | 0.152 | 0.901 | -0.779 | -0.651 | -0.486 | -0.159 | -0.321 | 0.391 | 0.285 | -0.562 | 0.055 | -0.192 | -0.646 | -0.544 | 0.115 | -0.208 |
| MEX gen 2 | 0.164 | 0.309 | 0.299 | 0.589 | 0.123 | 0.459 | -0.607 | -0.386 | -0.191 | 0.331 | -0.529 | -0.323 | 0.026 | -0.288 | -0.907 | -0.514 | -0.573 | -0.036 | 0.226 | 0.475 | 0.164 | -0.122 | 0.567 | -0.410 |
| MEX gen 3 | -0.159 | -0.202 | -0.306 | 0.161 | 0.585 | 0.046 | -0.290 | -0.252 | 0.211 | 0.409 | 0.037 | -0.201 | -0.039 | 0.058 | -0.193 | 0.329 | -0.238 | 0.031 | -0.209 | 0.100 | 0.158 | -0.051 | 0.166 | -0.421 |
| MEX gen 4 | -0.462 | -0.221 | 0.133 | -0.141 | 0.210 | 0.197 | 0.124 | -0.241 | 0.252 | -0.272 | -0.060 | 0.360 | -0.044 | 0.041 | 0.106 | 0.089 | -0.132 | 0.148 | -0.063 | 0.186 | -0.048 | -0.144 | -0.084 | 0.226 |

Notes: The table reports for each attitude the deviation from the norm, based on the estimated country specific fixed effects for each generation of our synthetic dynasty.

Table A3: Sensitivity of Convergence Across Different Criteria

| | | Gen 4 $\pi_{45}$ | Gen 4 $\pi_{33}$ | Gen 4 $\pi_{22.5}$ | Gen 4 $\pi_{15}$ |
|---|---|---|---|---|---|
| Group A - Cooperation | *trust*<br>*fair*<br>*helpful* | 86% | 86% | 81% | 67% |
| Group B - Government | *eqwlth*<br>*helppoor*<br>*polviews* | 76% | 52% | 38% | 38% |
| Group C - Religion | *attend*<br>*pray*<br>*reliten*<br>*postlife*<br>*prayer* | 77% | 69% | 60% | 40% |
| Group D - Family | *thnkself*<br>*obey*<br>*pillok*<br>*aged*<br>*divlaw*<br>*socrel* | 86% | 69% | 67% | 50% |
| Group E - Gender Roles | *fechild*<br>*fepol* | 71% | 71% | 64% | 64% |
| Group F - Abortion | *abany*<br>*abany* | 71% | 57% | 57% | 50% |
| Group G - Sexual Behavior | *premarsx*<br>*homosex* | 71% | 50% | 43% | 36% |
| Group H - Mobility/Success | *getahead* | 71% | 57% | 57% | 14% |

Rank Correlation

| | Gen 4 $\pi_{45}$ | Gen 4 $\pi_{33}$ | Gen 4 $\pi_{22.5}$ | Gen 4 $\pi_{15}$ |
|---|---|---|---|---|
| Gen 4 $\pi_{45}$ | 1.00 | | | |
| Gen 4 $\pi_{33}$ | 0.59 | 1.00 | | |
| Gen 4 $\pi_{22.5}$ | 0.54 | 0.88 | 1.00 | |
| Gen 4 $\pi_{15}$ | 0.43 | 0.76 | 0.72 | 1.00 |

Notes: The table shows different orderings of the speed of convergence according to the percentage of country-wave observations for which the absolute value of the deviation from the norm in the first generation has been cut by any amount (Gen 4 $\pi_{45}$), by a third (Gen 4 $\pi_{30}$), by half (Gen 4 $\pi_{22.5}$), and by two thirds (Gen 4 $\pi_{15}$) by generation 4. The second table lists the rank correlations between the different convergence criteria.

Table A4: Convergence of Cultural Attitudes: Dealing with Countries Close to the Norm

| | | Gen 4 $\pi_{22.5}$ | Gen 4 $\pi_{22.5}$ | Gen 2 $\pi_{22.5}$ | △ | 90% CI | 95% CI |
|---|---|---|---|---|---|---|---|
| Group A - Cooperation | *trust* | 71% | 81% | 33% | 48% | (14%, 48%) | (10%, 52%) |
| | *fair* | 71% | | | | | |
| | *helpful* | 100% | | | | | |
| Group B - Government | *eqwlth* | 71% | 57% | 57% | 0% | (5%, 43%) | (-5%, 47%) |
| | *helppoor* | 57% | | | | | |
| | *polviews* | 43% | | | | | |
| Group C - Religion | *attend* | 86% | 66% | 49% | 17% | (3%, 31%) | (0%, 34%) |
| | *pray* | 57% | | | | | |
| | *reliten* | 57% | | | | | |
| | *postlife* | 71% | | | | | |
| | *prayer* | 57% | | | | | |
| Group D - Family | *thnkself* | 57% | 71% | 45% | 26% | (12%, 36%) | (10%, 38%) |
| | *obey* | 71% | | | | | |
| | *pillok* | 86% | | | | | |
| | *aged* | 57% | | | | | |
| | *divlaw* | 100% | | | | | |
| | *socrel* | 57% | | | | | |
| Group E - Gender Roles | *fechild* | 86% | 71% | 43% | 29% | (-7%, 43%) | (-7%, 50%) |
| | *fepol* | 57% | | | | | |
| Group F - Abortion | *abany* | 43% | 57% | 50% | 7% | (-7%, 36%) | (-7%, 43%) |
| | *abany* | 71% | | | | | |
| Group G - Sexual Behavior | *premarsx* | 43% | 50% | 50% | 0% | (0%, 50%) | (-7%, 57%) |
| | *homosex* | 57% | | | | | |
| Group H - Mobility/Success | *getahead* | 57% | 57% | 57% | 0% | (-28%, 43%) | (-28%, 43%) |

Notes: This table replicates Table 4. Gen 4 $\pi_{22.5}$ (Gen 2 $\pi_{22.5}$) denotes the average percentage of country observations for which the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 4 (2) within each group, or belong to the lowest decile of the proportional distance from the norm in the first generation and do not increase it in the future generations. △ denotes the difference in the percentage of convergent cases between generations 4 and generation 2. The last two columns report the bootstrapped 90% and 95% confidence intervals for △, based on 500 replications estimating the Probit equation, based on stratified sampling with replacement in the country-generation-cohort cells.

Table A5a: Convergence of Cultural Attitudes: Limited Set of Controls

| | | Gen 4 $\pi_{22.5}$ | Gen 4 $\pi_{22.5}$ | Gen 2 $\pi_{22.5}$ | △ | 90% CI | 95% CI |
|---|---|---|---|---|---|---|---|
| Group A - Cooperation | *trust* | 86% | 90% | 38% | 52% | (14%, 48%) | (10%, 52%) |
| | *fair* | 86% | | | | | |
| | *helpful* | 100% | | | | | |
| Group B - Government | *eqwlth* | 71% | 62% | 48% | 14% | (.1%, 48%) | (0%,48 %) |
| | *helppoor* | 43% | | | | | |
| | *polviews* | 71% | | | | | |
| Group C - Religion | *attend* | 71% | 69% | 43% | 26% | (3%, 34%) | (0%, 38%) |
| | *pray* | 29% | | | | | |
| | *reliten* | 86% | | | | | |
| | *postlife* | 86% | | | | | |
| | *prayer* | 71% | | | | | |
| Group D - Family | *thnkself* | 71% | 62% | 36% | 26% | (12%, 38%) | (10%, 40%) |
| | *obey* | 57% | | | | | |
| | *pillok* | 71% | | | | | |
| | *aged* | 43% | | | | | |
| | *divlaw* | 86% | | | | | |
| | *socrel* | 43% | | | | | |
| Group E - Gender Roles | *fechild* | 71% | 71% | 50% | 21% | (-7%, 43%) | (-7%, 43%) |
| | *fepol* | 71% | | | | | |
| Group F - Abortion | *abany* | 57% | 79% | 57% | 21% | (0%, 43%) | (-7%, 43%) |
| | *abany* | 100% | | | | | |
| Group G - Sexual Behavior | *premarsx* | 57% | 50% | 50% | 0% | (-7%, 43%) | (-14%, 43%) |
| | *homosex* | 43% | | | | | |
| Group H - Mobility/Success | *getahead* | 57% | 57% | 71% | -14% | (-14%, 43%) | (-29%, 57%) |

Notes: This table replicates Table 4 using a limited set of controls (age, age squared, income, education, year-of-the-survey dummy, gender, regional indicators, and urbanization indicators). Gen 4 $\pi_{22.5}$ (Gen 2 $\pi_{22.5}$) denotes the average percentage of country observations for which the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 4 (2) within each group. △ denotes the difference in the percentage of convergent cases between generations 4 and generation 2. The last two columns report the bootstrapped 90% and 95% confidence intervals for △, based on 500 replications estimating the Probit equation, based on stratified sampling with replacement in the country-generation-cohort cells.

Table A5b: Convergence of Cultural Attitudes: Limited Set of Controls

| | | Gen 4 $\pi_{22.5}$ | Gen 4 $\pi_{22.5}$ | Gen 2 $\pi_{22.5}$ | △ | 90% CI | 95% CI |
|---|---|---|---|---|---|---|---|
| Group A - Cooperation | *trust* | 71% | 76% | 33% | 43% | (14%, 52%) | (10%, 52%) |
| | *fair* | 71% | | | | | |
| | *helpful* | 86% | | | | | |
| Group B - Government | *equlth* | 43% | 48% | 43% | 5% | (0%, 43%) | (0%, 48%) |
| | *helppoor* | 57% | | | | | |
| | *polviews* | 43% | | | | | |
| Group C - Religion | *attend* | 57% | 54% | 49% | 6% | (0%, 29%) | (-3%, 34%) |
| | *pray* | 29% | | | | | |
| | *reliten* | 71% | | | | | |
| | *postlife* | 86% | | | | | |
| | *prayer* | 29% | | | | | |
| Group D - Family | *thnkself* | 86% | 67% | 36% | 31% | (14%, 40%) | (12%, 43%) |
| | *obey* | 71% | | | | | |
| | *pillok* | 86% | | | | | |
| | *aged* | 29% | | | | | |
| | *divlaw* | 71% | | | | | |
| | *socrel* | 57% | | | | | |
| Group E - Gender Roles | *fechild* | 86% | 64% | 64% | 0% | (-7%, 43%) | (-7%, 43%) |
| | *fepol* | 43% | | | | | |
| Group F - Abortion | *abany* | 71% | 79% | 57% | 21% | (-7%, 36%) | (-7%, 43%) |
| | *abany* | 86% | | | | | |
| Group G - Sexual Behavior | *premarsx* | 57% | 57% | 43% | 14% | (-7%, 43%) | (-14%, 43%) |
| | *homosex* | 57% | | | | | |
| Group H - Mobility/Success | *getahead* | 57% | 57% | 71% | -14% | (-14%, 43%) | (-29%, 57%) |

Notes: This table replicates Table 4 using a limited set of controls (age, age squared, year-of-the-survey dummy, gender, regional indicators, and urbanization indicators). Gen 4 $\pi_{22.5}$ (Gen 2 $\pi_{22.5}$) denotes the average percentage of country observations for which the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 4 (2) within each group. △ denotes the difference in the percentage of convergent cases between generations 4 and generation 2. The last two columns report the bootstrapped 90% and 95% confidence intervals for △, based on 500 replications estimating the Probit equation, based on stratified sampling with replacement in the country-generation-cohort cells.

Table A6a: Convergence of Cultural Attitudes: Great Britain as Benchmark

| | | Gen 4 $\pi_{22.5}$ | Gen 4 $\pi_{22.5}$ | Gen 2 $\pi_{22.5}$ | △ | 90% CI | 95% CI |
|---|---|---|---|---|---|---|---|
| Group A - Cooperation | *trust* | 50% | 78% | 28% | 50% | (14%, 48%) | (14%, 57%) |
| | *fair* | 83% | | | | | |
| | *helpful* | 100% | | | | | |
| Group B - Government | *equlth* | 83% | 50% | 39% | 11% | (10%, 43%) | (5%, 48%) |
| | *helppoor* | 17% | | | | | |
| | *polviews* | 50% | | | | | |
| Group C - Religion | *attend* | 67% | 57% | 43% | 13% | (0%, 31%) | (-3%, 34%) |
| | *pray* | 33% | | | | | |
| | *reliten* | 67% | | | | | |
| | *postlife* | 67% | | | | | |
| | *prayer* | 50% | | | | | |
| Group D - Family | *thnkself* | 50% | 64% | 25% | 39% | (12%, 38%) | (10%, 40%) |
| | *obey* | 67% | | | | | |
| | *pillok* | 83% | | | | | |
| | *aged* | 67% | | | | | |
| | *divlaw* | 83% | | | | | |
| | *socrel* | 33% | | | | | |
| Group E - Gender Roles | *fechild* | 67% | 75% | 75% | 0% | (-7%, 43%) | (-7%, 43%) |
| | *fepol* | 83% | | | | | |
| Group F - Abortion | *abany* | 33% | 58% | 42% | 17% | (-7%, 36%) | (-14%, 43%) |
| | *abany* | 83% | | | | | |
| Group G - Sexual Behavior | *premarsx* | 50% | 58% | 42% | 17% | (0%, 43%) | (-7%, 50%) |
| | *homosex* | 67% | | | | | |
| Group H - Mobility/Success | *getahead* | 33% | 33% | 50% | -17% | (-29%, 43%) | (-29%, 43%) |

Notes: This table replicates Table 4 using the attitude of the fourth generation of GB immigrants as a benchmark. Gen 4 $\pi_{22.5}$ (Gen 2 $\pi_{22.5}$) denotes the average percentage of country observations for which the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 4 (2) within each group.△ denotes the difference in the percentage of convergent cases between generations 4 and generation 2. The last two columns report the bootstrapped 90% and 95% confidence intervals for △, based on 500 replications estimating the Probit equation, based on stratified sampling with replacement in the country-generation-cohort cells.

Table A6b: Convergence of Cultural Attitudes: Including Mexico in Benchmark

| | | Gen 4 $\pi_{22.5}$ | Gen 4 $\pi_{22.5}$ | Gen 2 $\pi_{22.5}$ | $\triangle$ | 90% CI | 95% CI |
|---|---|---|---|---|---|---|---|
| Group A - Cooperation | *trust* | 57% | 71% | 33% | 38% | (14%, 48%) | (10%, 52%) |
| | *fair* | 57% | | | | | |
| | *helpful* | 100% | | | | | |
| Group B - Government | *eqwlth* | 71% | 43% | 43% | 0% | (0%, 43%) | (-5%, 43%) |
| | *helppoor* | 29% | | | | | |
| | *polviews* | 29% | | | | | |
| Group C - Religion | *attend* | 57% | 57% | 46% | 11% | (3%, 31%) | (0%, 34%) |
| | *pray* | 43% | | | | | |
| | *reliten* | 57% | | | | | |
| | *postlife* | 86% | | | | | |
| | *prayer* | 43% | | | | | |
| Group D - Family | *thnkself* | 57% | 67% | 43% | 24% | (10%, 36%) | (7%, 40%) |
| | *obey* | 71% | | | | | |
| | *pillok* | 71% | | | | | |
| | *aged* | 43% | | | | | |
| | *divlaw* | 100% | | | | | |
| | *socrel* | 57% | | | | | |
| Group E - Gender Roles | *fechild* | 71% | 71% | 43% | 29% | 0%, 43%) | (-7%, 50%) |
| | *fepol* | 71% | | | | | |
| Group F - Abortion | *abany* | 43% | 64% | 50% | 14% | (-7%, 36%) | (-14%, 43%) |
| | *abany* | 86% | | | | | |
| Group G - Sexual Behavior | *premarsx* | 43% | 43% | 43% | 0% | (0%, 43%) | (-7%, 50%) |
| | *homosex* | 43% | | | | | |
| Group H - Mobility/Success | *getahead* | 57% | 57% | 71% | -14% | (-29%, 43%) | (-29%, 43%) |

Notes: This table replicates Table 4 using a benchmark that includes the attitudes of Mexican immigrants. Gen 4 $\pi_{22.5}$ (Gen 2 $\pi_{22.5}$) denotes the average percentage of country observations for which the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 4 (2) within each group. $\triangle$ denotes the difference in the percentage of convergent cases between generations 4 and generation 2. The last two columns report the bootstrapped 90% and 95% confidence intervals for $\triangle$, based on 500 replications estimating the Probit equation, based on stratified sampling with replacement in the country-generation-cohort cells.

Table A7: List of Matched Attitudes between the General Social Survey (GSS) and the European Values Survey/World Values Survey (EVS/WVS)

| GSS | EVS/WVS Question Number | Description of EVS variable |
|---|---|---|
| *trust* | a165 | Most people can be trusted (y=1 for yes if $x_{EVS} = 1$) |
| *attend* | f028 | How often do you attend religious services (y=1 for less often if $x_{EVS} > 3$) |
| *pray* | f063 | How important is God in your life (y=1 for less important if $x_{EVS} < 7$) |
| *postlife* | f051 | Believe in life after death (y=1 for no if $x_{EVS} = 0$) |
| *thnkself* | a029 | Important child qualities: independence (y=1 for important if $x_{EVS} = 1$) |
| *obey* | a042 | Important child qualities: obedience (y=1 for not important if $x_{EVS} = 0$) |
| *fechild* | d061 | Pre-school child suffers with working mother (y=1 for yes if $x_{EVS} > 2$) |
| *abany* | f120 | Justifiable: abortion (y=1 for yes if $x_{EVS} = 10$) |
| *homosex* | f118 | Justifiable: homosexuality (y=1 for yes if $x_{EVS} > 7$) |

Notes: The responses from the EVS/WVS have been recoded to have a binary outcome. We indicate the correspondence between GSS and EVS/WVS and the original value(s) from the EVS/WVS that are matched with the recoded GSS variables. $y$ denotes the indicator variable in the first stage Probit. $x_{EVS}$ denotes the answer number to the EVS/WVS questions.

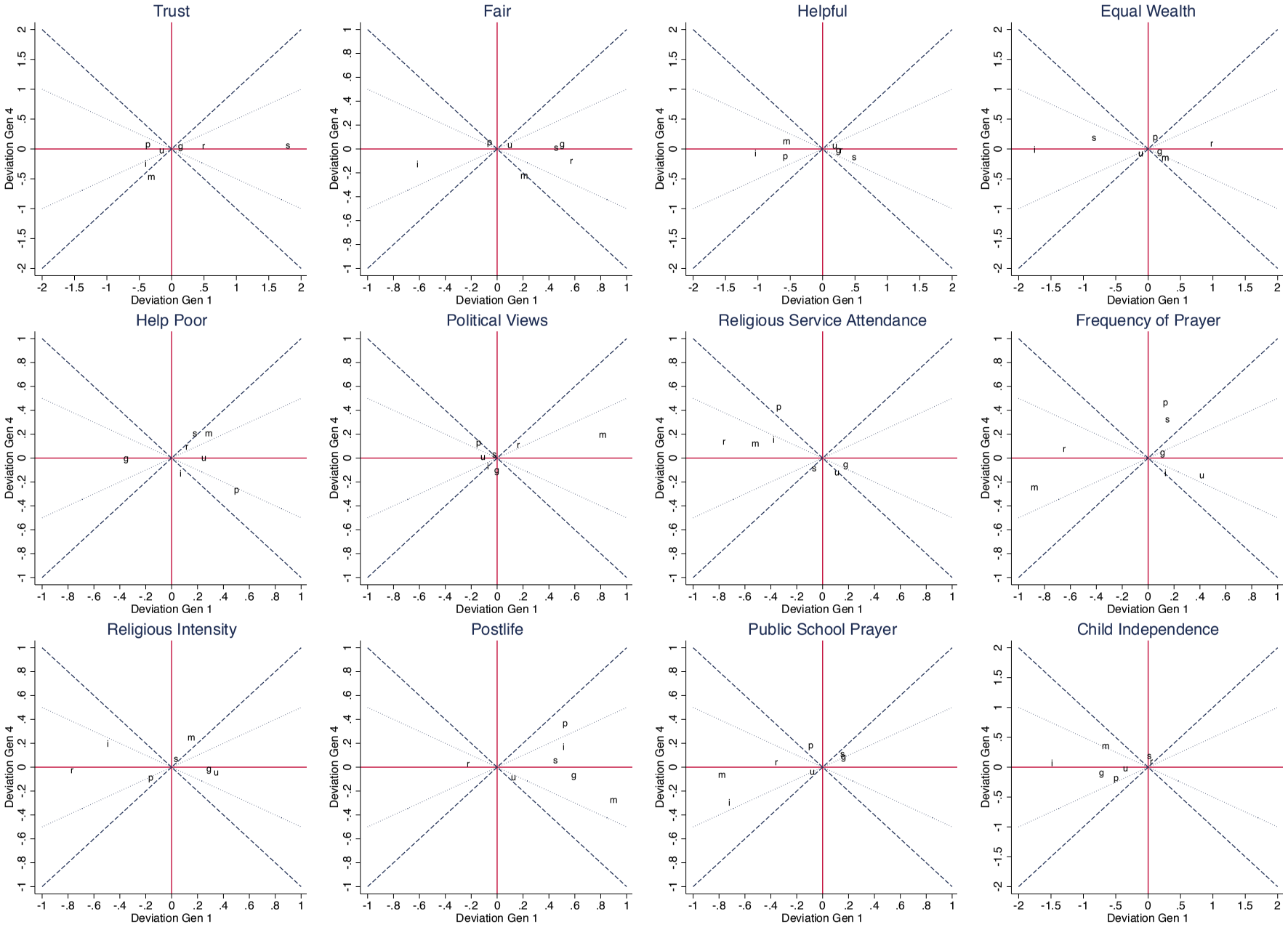


Fig. A1a: Country Deviation from Norm: Trust – Thinkself (British (u), Germany (g), Irish (r), Italy (i), Polish (p), Scandinavian (s), Mexican (m)

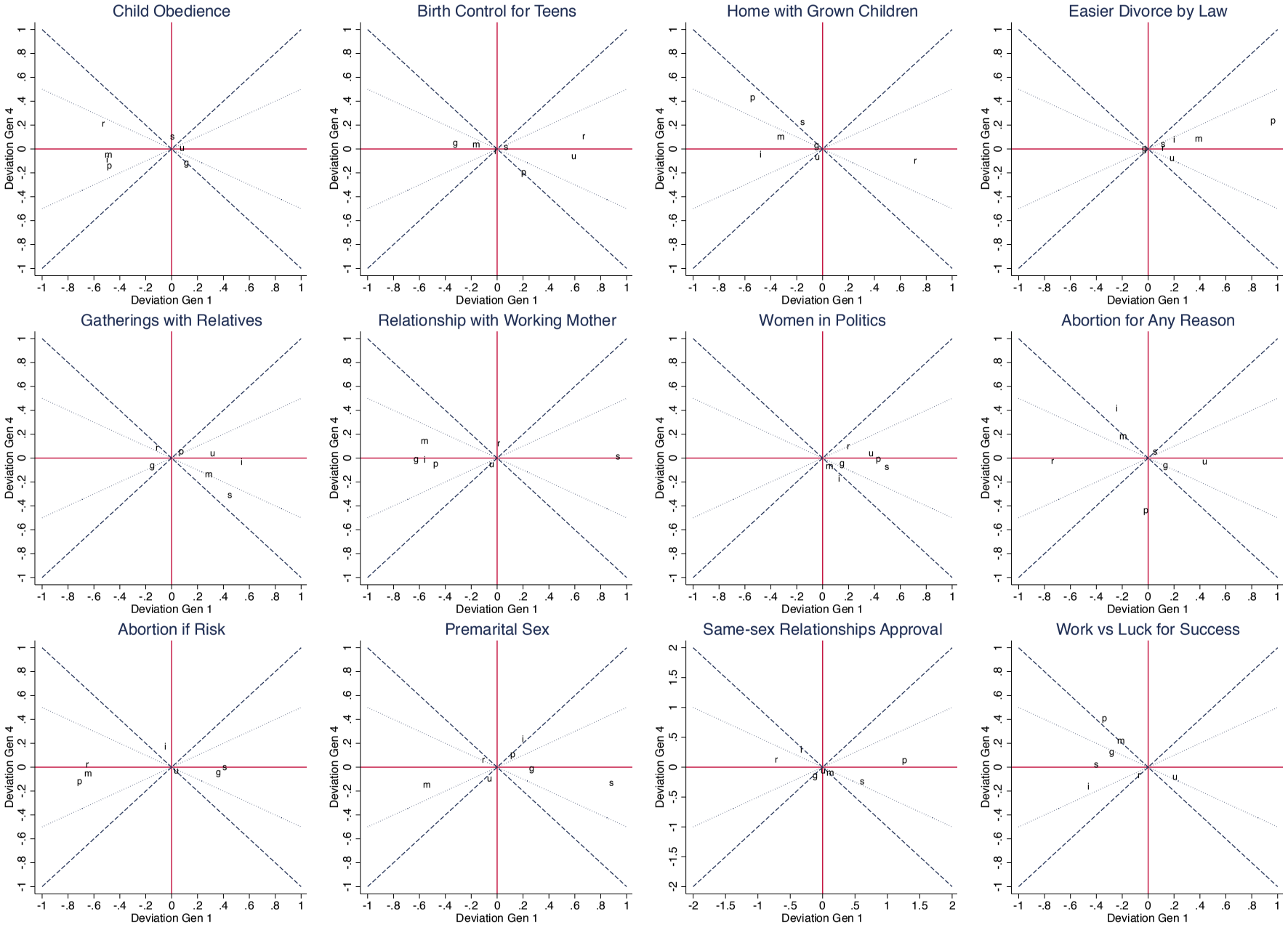


Fig. A1b: Country Deviation from Norm: Obey – Getahead (British (u), Germany (g), Irish (r), Italy (i), Polish (p), Scandinavian (s), Mexican (m)

## Appendix 2: Model Derivation (for online publication only)

### 7.1 The Child's Problem

#### Notation and assumptions

Let $V^i$, $(i = m \text{ or } M)$ be the surplus produced by a social interaction between two persons both belonging to the same group. Assume $V^m = V^M = V$ for simplicity. $V(1-\theta^M)$ is the surplus produced by a social interaction between a person, whose parents belong to the minority and who has not assimilated, with another person belonging to the majority, with $0 < \theta^M < 1$. $V(1-\theta^m)$ is the surplus of the interaction between a person whose parents belong to the minority and who has acquired the majority trait, with another person from the minority, with $0 < \theta^m < 1$. We assume that $\theta^M > \theta^m$ There is no loss in the transaction when two people have the same trait, so that is in this case the surplus is $V$. The proportion of the minority group in the population is $q < \frac{1}{2}$. $d\tau + z_i$, with $d > 0$ is the utility cost for a member of the minority for abandoning the parent's trait: it is increasing with the parent's socialization effort $\tau$ and includes an additive person specific stochastic component $z_i$ distributed randomly in the population according to the distribution function $G(.)$ that is assumed to be uniform in the range $[\underline{z}, \overline{z}]$. The child knows $z_i$, while the parent does not observe it, but knows its distribution $G(.)$.

#### Child maximization problem

The child meets at random individuals from the minority or majority groups with probability $q$ and $1-q$ respectively. Decisions are made before any meeting occurs. Her expected utility is $qV + (1-q)(1-\theta^M)V$ when the child does not assimilate, and $q(1-\theta^m)V + (1-q)V - d\tau - z_i$ when she assimilates. A child $i$ assimilates if the expected gain from assimilation is higher than the expected gain from non-assimilation:

$$(1-q)V\theta^M - q\theta^m V - d\tau - z_i \geq 0$$

The probability of assimilating (equal to the proportion of minority individuals that assimilate) after a draw of $z_i$ is given by:

$$G\left((1-q)V\theta^M - q\theta^m V - d\tau\right)$$

If $(1-q)V\theta^M - q\theta^m V - d(\tau) > \overline{z}$ the child will always decide to assimilate $(G(.) = 1)$. If $(1-q)V\theta^M - q\theta^m V - d(\tau) < \underline{z}$ the child will never assimilate $(G(.) = 0)$. When $\underline{z} \leq (1-q)V\theta^M - q\theta^m V - d(\tau) \leq \overline{z}$ , the child will assimilate with probability:

$$Prob\left(z_i \leq (1-q)V\theta^M - q\theta^m V - d\tau\right) = \int_{\underline{z}}^{(1-q)V\theta^M - q\theta^m V - d\tau} \frac{1}{\overline{z} - \underline{z}} dt = \frac{(1-q)V\theta^M - q\theta^m V - d\tau - \underline{z}}{\overline{z} - \underline{z}}$$

## 7.2 The Parent's Socialization Problem

**Notation and assumptions**

Each family is a single-parent family and produces only one child. The parent can socialize the child at a cost $c(\tau) = \frac{c}{2}\tau^2$, and she derives utility $\varphi$ if the child maintains the family trait, which occurs with a probability she can affect through her educational effort. The parent also cares about her child's utility. The extent of a parent empathy is described by $\beta$: for $\beta = 0$ the parent doesn't care about the child's utility and only cares about her wish that the child does not assimilate.

**Parent maximization**

We abstract from all components of the parent's utility that do not depend upon the costs and benefits of educating the child. The parent maximizes her expected utility $w(\tau)$ given by:

$$\begin{aligned} w(\tau) = & -c(\tau) + \varphi Prob(\text{no child assimilation}) + \\ & +\beta Prob(\text{no child assimilation}) \left[qV + (1-q)V(1-\theta^M)\right] \\ & +\beta Prob(\text{child assimilation }) \left[q(1-\theta^m)V + (1-q)V - d(\tau)\right] - \\ & -\beta \int_{\underline{z}}^{(1-q)\theta^M V - q\theta^m V - d\tau} \frac{z_i}{\overline{z} - \underline{z}} dz_i \end{aligned} \tag{A8}$$

The parent's optimal socialization effort is determined by the following first order condition:

$$c\tau + \beta d \frac{(1-q)\theta^M V - q\theta^m - d\tau - \underline{z}}{\overline{z} - \underline{z}} = \frac{\varphi d}{\overline{z} - \underline{z}}$$

Solving for the optimal level of $\tau$, $\tau^*$, one obtains:

$$\tau^* = \frac{\varphi - \beta[(1-q)\theta^M V - q\theta^m V - \underline{z}]}{\frac{c(\overline{z}-\underline{z})}{d} - \beta d} \tag{A9}$$

For concavity of the objective function $\frac{\partial^2 w}{\partial \tau^2} = -c + \frac{\beta d^2}{\overline{z}-\underline{z}} < 0$ and hence the denominator in (A9) is positive. We assume that $\varphi - \beta[(1-q)\theta^M V - q\theta^m - \underline{z}] \geqslant 0$ to guarantee that the parent's effort is non negative.

## 7.3 Assimilation and Non-Assimilation Equilibria and Dynamics: Phase Diagram and Location of $\tilde{q}$

Assume that $\underline{z} \leq (1 - q(0))\theta^M V - q(0)\theta^m V - d\tau^* \leq \overline{z}$ , where $q(0)$ is the initial proportion of the minority group in the population, so that there is an incentive to assimilate for at least some members of the minority. The probability of assimilation evaluated at the optimal parent's effort, $\tau^*$, is:

$$G\left((1-q_t)\theta^M V - q\theta^m V - d\left(\frac{\varphi - \beta[(1-q_t)\theta^M V - q_t\theta^m - \underline{z}]}{\frac{c(\overline{z}-\underline{z})}{d} - \beta d}\right)\right)$$

This is also the proportion of minority members in the population that assimilate. The decrease in the proportion of the minority between $t+1$ and $t$ , $-(q_{t+1}-q_t)$ equals the proportion of the minority that assimilates between these two dates $G\left((1-q_t)\theta^M V - q_t\theta^m V - d\tau_t^*\right)$, times the size of the minority at $t$, $q_t$:

$$\begin{aligned} q_{t+1}-q_t &= -G\left((1-q_t)\theta^M V - q_t\theta^m V - d\tau_t^*\right) q_t \\ &= -\frac{(1-q_t)\theta^M V - q_t\theta^m V - d\tau^* - \underline{z}}{\overline{z}-\underline{z}} q_t \end{aligned} \tag{A10}$$

with $\tau_t^*$ defined in (A9). Equation (A10) represents the dynamics of the system when $\underline{z} \leq (1-q_t)\theta^M V - q_t\theta^m V - d\tau_t^* \leq \overline{z}$ . When $(1-q_t)\theta^M V - q\theta_t^m V - d\tau^* \leq \underline{z}$ nobody assimilates, $G(.)=0$ and $q_{t+1}-q_t=0$. Denote with $\tilde{q}$ the value of $q_t$,such that $(1-\tilde{q})\theta^M V - \tilde{q}\theta^m V - d\tau^* = \underline{z}$ so that there is no gain from assimilation. For greater (smaller) values than $\tilde{q}$ the net gain is negative (positive). At $\tau^*$ defined in (A9):

$$\tilde{q} = \frac{\theta^M V - \frac{\varphi d^2}{c(\overline{z}-\underline{z})} - \underline{z}}{\theta^M V + \theta^m V} \tag{A11}$$

Moreover, $0<\tilde{q}<1$. If $\widetilde{q} < q_0 < \frac{1}{2}$, then the initial proportion of the minority is an equilibrium because there is no net gain from assimilation. As we are dealing with a minority $q_0 < \frac{1}{2}$ by assumption. If $q_0 < \text{Min}(\frac{1}{2}, \tilde{q})$, the steady state equilibrium implies full integration ($q=0$).

The dynamics of assimilation is determined by:

$$q_{t+1} = \left(1 - \frac{(1-q_t)\theta^M V - q_t\theta^m V - d\left(\frac{\varphi - \beta[(1-q_t)\theta^M V - q_t\theta^m V - \underline{z}]}{\frac{c(\overline{z}-\underline{z})}{d} - \beta d}\right) - \underline{z}}{\overline{z}-\underline{z}}\right) q_t \tag{A12}$$

$$\frac{dq_{t+1}}{dq_t} = \left(1 - \frac{(1-q_t)\theta^M V - q_t\theta^m V - d\left(\frac{\varphi_0 - \beta[(1-q_t)\theta^M V - q_t\theta^m V - \underline{z}]}{\frac{c(\overline{z}-\underline{z})}{d} - \beta d}\right) - \underline{z}}{\overline{z}-\underline{z}}\right) + \left(\frac{\theta^M V + \theta^m V + \beta d \frac{[\theta^M V - q_t\theta^m V]}{\frac{c(\overline{z}-\underline{z})}{d} - \beta d}}{\overline{z}-\underline{z}}{}_t\right) q_t > 0 \tag{A13}$$

$$\frac{d^2 q_{t+1}}{dq_t^2} = \frac{2c(\theta^M V + \theta^m V)}{c(\overline{z}-\underline{z}) - \beta d^2} > 0 \tag{A14}$$

Therefore the relationship between $q_{t+1}$ and $q_t$ (the phase line) starts at zero and it is increasing and convex. It intersects the 45 degree line also at $\tilde{q}$, where $\tilde{q}$ satisfies $(1-\tilde{q})\theta^M V - \tilde{q}V\theta^m V - d\tau^* = \underline{z}$ ,so that there are no gain from assimilation and $G\left((1-\tilde{q})\theta^M V - \tilde{q}\theta^m V - d\tau^*\right) = 0$.

Our parametrization implies:

$$\tilde{q} = \frac{\theta^M V - \frac{\varphi d^2}{c(\overline{z}-\underline{z})} - \underline{z}}{\theta^M V + \theta^m V} \tag{A15}$$

The numerator of the first line on the right hand side of (A15) is strictly positive, because we assume that $(1-q)\theta^M V - q\theta^m V - d\tau^* \geq \underline{z}$ which implies that $(1-q)\theta^M V - q\theta^m V - \frac{\varphi_0 d^2}{c(\overline{z}-\underline{z})} - \underline{z} \geq 0$. Hence $\tilde{q} > 0$ . The numerator and denominator of (A15) also imply that $\tilde{q} < 1$. Therefore, $0 < \tilde{q} < 1$ as claimed in the text.

The full integration equilibrium is locally stable with the minority in this case gradually shrinking in size. All this is summarized in Figure 1a and Figure 1b, where the steady state(s) and dynamics of the system are represented.