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Culture: Persistence and Evolution

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Abstract

This paper presents evidence on the speed of evolution (or lack thereof) of a wide range of values and beliefs of different generations of European immigrants to the US and interprets the evidence in the light of a simple model of socialization and identity choice. The main result is that persistence differs greatly across cultural attitudes. For instance, many family values, political orientation, and most deep personal religious values converge slowly to the prevailing US norm. Others, such as attitudes toward cooperation, children's independence, and sexual matters, converge rather quickly. The results obtained studying higher generation immigrants differ greatly from those found when the analysis is limited to the second generation, as typically done in the literature, and they imply a lesser degree of persistence than previously thought. Finally, we show that persistence is "culture specific" in the sense that the country from which one's ancestors came matters for the pattern of generational convergence.

JEL Classification: A13, F22, J00, J61, Z1.

Keywords: Culture, Values, Beliefs, Transmission, Persistence, Evolution, Immigration, Integration

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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 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 models of cultural transmission are thus at work, as in the models of evolutionary biology[4]: vertical transmission, like genetic inheritance, tends to be relatively more conservative, 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 a few generations.

Thinking about these issues, it is reasonable to consider immigrants an ideal group to study. The incentives that give rise to vertical transmission could be particularly strong among immigrants, as early-generations 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.

[1] See Putnam (1993), Guiso, Sapienza and Zingales (2006, 2007, 2008), Tabellini (2008a,b), Alesina, Giuliano and Nunn (2013), Durante (2009), and Roland (2004). See Alesina and Giuliano (2013) for a recent review.

[2] See Gruber and Hungerman (2008), Alesina and Fuchs-Schuendeln (2007), Di Tella, 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).

But some of these inherited values may be at odds with the culture of the new country in which they are living, possibly hindering productive interaction with other groups, and may be modified by the social interactions in the new environment: horizontal transmission could thus also be particularly strong among immigrants.

In this paper we investigate the speed of evolution of a wide range of cultural attitudes for different generations of European immigrants to the United States. We look at a variety of attitudes, rather than a single one because we surmise there is substantial heterogeneity across cultural traits and immigrant origins 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 about religion, family, gender, sexuality, cooperation, redistribution, etc., distinguishing between first, second, third and fourth (or higher) generations of European immigrants to the US. The focus on European immigrants is largely imposed on us by the availability of sufficient data for multiple generations distinguished by country of origin. We use data contained in 21 waves (the exact number varies across attitudes) of the GSS survey collected between the end of the 1970's and 2012. 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 for *multiple* traits.

Immigrants provide a particularly useful laboratory for the study of the evolution of values and beliefs because, as mentioned above, their cultural attitudes are likely to bear the mark of the country from which they, their parents or their grandparents emigrated.[5] However, they are also influenced by their exposure to US society and its social, political, and economic institutions, often very different from those of the country of origin. They 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 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]

In order to provide some structure in discussing the results, we develop a simple model of

[5]See Fernandez (2008).

[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, and Doepke and Zilibotti (2008) for a model of endogenous preference formation.

socialization and identity choice. The model builds largely on the contributions by Bisin and Verdier (2001) on the choice of socialization by parents, 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 trait, 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 of the child's optimization problem, knowing the distribution of the switching cost, but not the realization for their child. The model yields two possible type of 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, depends upon a set of parameters that are likely to vary across different cultural traits and across 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.

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 empirical work, in order to separate convergence of values across generations of immigrants from convergence of values over time across countries of origin. For this reason we study the transmission of values and beliefs within a single dynasty, starting with first generation immigrants born before World War I. We follow the cohort of the children of this generation, and the cohorts of their grand children and of their grand-grand children.

Finally, one should not forget that our results are specific to, say, Irish immigrants and cannot be extended to all Irishmen, including those who never left Ireland, since emigrants are not a random sample of the population. We will discuss how selection issues within first generation immigrants, between those who decide to stay and those who return to the original countries leads to an underestimate or overestimate of the speed of change of culture.[7]

[7]The speed at which attitudes evolve may depend upon the community within which a person lives. Italians immigrants who were brought up in New York's Little Italy neighborhood are likely to lose their "country-of-origin" attitudes more slowly than Italians who settled in the mid-West. Sample sizes in the GSS do not allow us to address fully this issue. We will leave it for future research.

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.[9] 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.[10]

The paper has three main findings. First we provide evidence of heterogeneity across cultural traits in the speed with which they evolve across generations and converge to the prevailing norm. We document the persistence of family values (parental control on teenager's access to contraception, ease of divorce, and frequency of social events with relatives, the role of women in society at large and in politics), political views, and deep individual religious values (as reflected in the answers to questions regarding belief in the frequency of prayer and approval of prayer in public schools). As a result, the values of immigrants of fourth-or-higher generation still bear strongly the imprint of their ancestors, who migrated to the United States many decades earlier. We also show that attitudes towards cooperation (the trustworthiness, helpfulness and fairness of others), children's independence, and sexuality converge, instead, more quickly, as successive generations adapt to the norms of the new society in which they live. The same is true – namely relative fast convergence – for the

[8]Earlier contributions in the sociological literature use 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]See also Algan, Bisin, Manning and Verdier (2012) and associated authors for a study of the pattern of cultural and economic integration of immigrants in Europe, and how they differ by immigrant communities, religious beliefs and host countries. The empirical evidence is based on the European Social Survey, complemented by other data sources, and the focus is on the first and second generation's indicators of social and cultural integration (family arrangements, fertility, education, labor market outcomes, religion, language spoken, etc.).

[10]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.

frequency of attendance to religious services. The latter reflects the social dimension of the religious experience and behaves differently from the other slow moving personal religious values mentioned above. Finally, results concerning cultural attitudes towards women's role outside the home imply a faster convergence of attitudes towards women in the workplace, such as the perceived cost of market work for the mother-child relationship, compared to attitudes about the general role of women in politics.

These results are largely consistent with one prediction of our simple model in the sense that faster convergence is observed for attitudes that are likely to generate larger transaction gains from assimilation, such as attitudes towards cooperation, compared to those for which transaction gains are likely to be smaller, such as the frequency of prayer and approval of prayer in public schools. Convergence is also slower for attitudes for which the utility gain to the parents from the child retaining the original trait is likely to be higher, such as some family values. Interestingly, the relatively faster convergence of attitudes towards women's work in the market, as opposed to their role in politics, can be explained by the large economic gains from having women participating in market work.

Our second important result is that time since the original immigration of the ancestors matters and that the 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 still closely reflect those of the country of origin, does not imply *per se* that attitudes are very persistent. For instance, the beliefs that shape trust of second generation immigrant towards other members of society still bear strongly the mark of the country of origin and are different for immigrants from different countries of origin. However, such differences become smaller when one considers fourth or higher-generation immigrants.

Finally, we find that persistence is "culture-specific" in the sense that the country from which one's ancestors came 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 and the degree of difficulty in learning English are (negatively) correlated with the fraction of attitudes for which we observe faster convergence. These results could also 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 involved, 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 we discuss how we measure cultural attitudes in the GSS, how we define generations and ethnic origin, and which European countries (or groups of countries) we use in our analysis. In Section 4 we describe how we

recover the country of origin effect for different generations, dynasties and time periods, while in Section 5 we illustrate our measure of cultural "convergence". In Section 6 we present and discuss our main empirical results. Section 7 contains several robustness checks and extensions. Section 8 concludes.

2 Why Persistence Can Differ Among Cultural Traits and Countries of Origin : A Model of Cultural Transmission

This section contains a simple model that will help interpret our main empirical findings, namely that different cultural traits may converge at varying speed, or not converge at all. Moreover, the dynamics of cultural convergence may differ across cultures i.e. in terms of our empirical work, across countries of origin. The model is based on the idea 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. The model draws on the vast literature carefully reviewed in Bisin and Verdier (2011).[11]

The model is set up as follows. Assume there is one cultural trait in the population that can take two values: one associated with the minority, denoted by m and the other associated with the majority, denoted by M. Think of the two traits as representing, for instance, the attitude towards pre-marital sex, one of the attitudes whose evolution we study in our empirical analysis. Recent immigrants (the minority) might still carry their cultural attitudes of the country of origin, which could be quite different from those of the majority in the United States, the new social environment in which they live.

We normalize the population to 1 and assume that the initial size of the minority is q. Consider a second-generation immigrant belonging to the minority group. Personal attitudes 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. For instance, if the norm in society (the norm of the majority) is that young people live together before deciding whether or not to get married, excluding pre-marital sex will make it more difficult for the child to find a partner and get married. However, breaking with a more traditional view of sexual morality may also generate a costly conflict with one's family, the more so the

[11] See also Pichler (2010), Vaughan (2012), and Panebianco (2014).

greater the parents' effort to educate the child.

We shall proceed in three steps. First we study the child's identity choice problem: what determines her decision whether or not to "assimilate", that is to abandon the minority trait and acquire the majority trait.[12] Building on Lazear (1999) and Konya (2005), we assume that switching from the old to the new 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 educating her. Then we shall go back and analyze 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. Her educational decision will balance these two incentives.

To keep the problem simple, we assume that each individual lives two periods. In the first period, after having been educated by her family, she interacts with others of the same cohort 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 received 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.

We show that 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 depends upon a set of parameters that capture the cost and benefits for the child and for the parent of assimilating or not, and that are likely to vary across cultural traits, and also across countries of origin.

2.1 The Child's Identity Choice Problem

The child's problem is a simple variant of Lazear (1999)[13]: V^i, ($i = m$ or M) denotes the surplus produced by a social interaction between two people 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 irrelevant for our results. The interaction between two

[12] See also the seminal paper on identity choice by Akerlof and Kranton (2000), as well as Bisin et al (2011).
[13] See also Konya (2005) for a dynamic extension.

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, that is 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). $d(\tau, t_i)$ 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 τ and also includes an additive stochastic component t_i that can be interpreted as the cost of learning the new (majority) trait, so that $d(\tau, t_i) = d(\tau) + t_i$, with $d(\tau)' > 0$. We assume t_i to be distributed randomly in the population according to the distribution function $G(.)$. The child knows t_i, while the parent does not observe it, but knows its distribution $G(.)$.

The child's meets at random individuals from the minority or majority groups with probability q and $1-q$ respectively. Following Lazear (1999) we assume that the child decides whether or not to assimilate at the beginning of the period, knowing the probability of meeting a minority or a majority member, but before having actually met them. Her expected utility is therefore equal to $qV + (1-q)(1-\theta^M)V$ when the child does not assimilate, and to $q(1-\theta^m)V + (1-q)V - d(\tau) - t_i$ when she assimilates. 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:

$$(1-q)V\theta^M - q\theta^m V - d(\tau) - t_i \geq 0 \tag{1}$$

Defining the cumulative density of t_i, with support $[\underline{t}, \bar{t}]$, the proportion of minority individuals that assimilate after a draw of t_i is given by:

$$G\left((1-q)V\theta^M - q\theta^m V - d(\tau)\right) \tag{2}$$

If $(1-q)V\theta^M - q\theta^m V - d(\tau) > \bar{t}$ the child will always decide to assimilate ($G(.) = 1$). If $(1-q)V\theta^M - q\theta^m V - d(\tau) < \underline{t}$ the child will never assimilate ($G(.) = 0$). When $\underline{t} \leq (1-q)V\theta^M - q\theta^m V - d(\tau) \leq \bar{t}$, the child will assimilate with some probability. Assume for simplicity that t_i is uniformly distributed on $[\underline{t}, \bar{t}]$. In this case the probability of assimilation and the proportion of minority individuals who assimilate is given by:

$$Prob\left(t_i \leq (1-q)V\theta^M - q\theta^m V - d(\tau)\right) = \int_{\underline{t}}^{(1-q)V\theta^M - q\theta^m V - d(\tau)} \frac{1}{\bar{t}-\underline{t}} dt = \frac{(1-q)V\theta^M - q\theta^m V - d(\tau)}{\bar{t}-\underline{t}} \tag{3}$$

2.2 The Parent's Socialization Problem

Each family is a single-parent family and produces only one child. As in Bisin and Verdier (2001) the parent can socialize the child at a cost $c(\tau)$, increasing in τ, and she derives utility $\varphi(\tau)$ 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 and how it is affected by her actions that contribute to determining, through $d(\tau)$, the probability of assimilation, and, hence, how productively the child will relate with the majority (and the minority). The extent of empathy is described by β: 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. We abstract from the components of the parent's utility that do not depend upon the costs and benefits of educating the child. Finally we also assume that the parent only cares about her immediate descendants.

Thus the parent maximizes her expected utility $w(\tau)$ given by:

$$\begin{aligned} w(\tau) \;=\; & -c(\tau) + \varphi(\tau) Prob(\text{no child assimilation}) + \\ & + \beta Prob(\text{no child assimilation}) \left[qV + (1-q)V(1-\theta^M)\right] \\ & + \beta Prob(\text{child asssimilation }) \left[q(1-\theta^m)V + (1-q)V - d(\tau)\right] - \\ & - \beta \int_{\underline{t}}^{(1-q)\theta^M V - q\theta^m V - d(\tau)} \frac{t_i}{\bar{t}-\underline{t}} dt_i \end{aligned} \tag{4}$$

Let us assume that $c(\tau) = \frac{c}{2}\tau^2$, $\varphi(\tau) = \varphi_0$, and $d(\tau) = d\tau$.[14] The parent's optimal socialization effort is determined by the following first order condition:

$$c\tau + \beta d \frac{(1-q)\theta^M V - q\theta^m - d\tau - \underline{t}}{\bar{t}-\underline{t}} = \frac{\varphi_0 d}{\bar{t}-\underline{t}} \tag{5}$$

The interpretation is simple: the left hand side is the marginal cost to the parent from varying τ, composed by the marginal direct socialization/education cost and by the expected change in the assimilation cost for the child, discounted by β (the parent's imperfect empathy parameter); the right hand side is the change in the expected direct benefit for the parent

[14] We could allow $\varphi_0 + \varphi_1\tau, \varphi_1 > 0$ but this would complicate the algebra without improving the intuition.

from non-assimilation. Solving for the optimal level of τ, τ^*, one obtains:

$$\tau^* = \frac{\varphi_0 - \beta[(1-q)\theta^M V - q\theta^m V - \underline{t}]}{\frac{c(\bar{t}-\underline{t})}{d} - \beta d} \tag{6}$$

For concavity of the objective function $\frac{\partial^2 w}{\partial \tau} = -c + \frac{\beta d^2}{\bar{t}-\underline{t}} < 0$ and hence the denominator in (6) is positive. We assume that $\varphi_0 - \beta[(1-q)\theta^M V - q\theta^m - \underline{t}] \geqslant 0$ to guarantee that the parent's effort is non negative. The comparative static for τ^* is intuitive. The parent's effort is increasing in φ_0, her benefit if the child does not assimilate. It is instead decreasing in c, the cost of the effort put into educating the child. It is also increasing in θ^M, the penalty for the descendant of a minority parent in interacting with members of the majority, if she holds on to the family trait, and decreasing in θ^m, the penalty for the descendant of a minority parent in interacting with members of the minority, if she adopts the majority trait. In the former case the benefit of assimilating for the child increases, while in the latter it decreases. A strong educational effort by the parent is thus a hindrance for the child, the more so the larger is θ^M and the smaller is θ^m. The empathic parent internalizes this and reduces her socialization effort the larger is θ^M and increases it the smaller is θ^m.

For given values of θ^M and θ^m, an increase in q has a positive effect on the parent's socialization effort because it decreases the probability of meeting a member of the majority, diminishing the expected penalty for descendants of minority parents associated with interacting with the majority (when not assimilated) and increases the cost of interacting with members of the minority (when assimilated). Note that our model does not display the "cultural sustainability property" of Bisin and Verdier (2001), whereby a minority parent makes a greater effort at socialization when q is small.

The effect on the parent's socialization effort of an increase in the total surplus from transactions is negative, as we have assumed that $q < \frac{1}{2}$ and $\theta^M > \theta^m$, so that the transaction net gains from assimilation are positive and the (partly) empathic parent takes this into account, therefore reducing τ^*. The effect of the parameter d, that captures the cost for the child of assimilating, and that depends on the parent's educational effort, is positive: the higher is d , the more effective is the socialization technology and this induces the parent to use it more intensely (increasing her effort). The effect of the discount factor β is ambiguous and the reason is simple: if β increases, it means that the parent gives more weight both the the child's net transaction benefits of assimilation ($(1-q)\theta^M V - q\theta^m$) and to the switching cost of assimilation ($d\tau$). The first effect leads the partly emphatic parent to decrease τ^*, so that the child can reap those benefits; the second leads to an increase in τ^*. Hence the effect of β is ambiguous. Finally, for a given spread of the distribution, $\bar{t} - \underline{t}$, a decrease in $\underline{t}$, which generates a leftward shift of the distribution, decreasing its mean, but keeping the

variance constant, is associated to a decrease in τ^*[15]: again, 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 $\underline{t}$, an increase in $\bar{t} - \underline{t}$ has the opposite effect by a similar logic.

2.3 Assimilation and Non-Assimilation Equilibria and Dynamics

Let us assume that that $\underline{t} \leq (1 - q(0))\theta^M V - q(0)\theta^m V - d\tau^* \leq \bar{t}$, 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. In this case the probability of assimilation evaluated at the optimal parent's effort, τ^*, is[16]:

$$G\left((1-q_t)\theta^M V - q\theta^m V - d\left(\frac{\varphi_0 - \beta[(1-q_t)\theta^M V - q_t\theta^m - \underline{t}]}{\frac{c(\bar{t}-\underline{t})}{d} - \beta d}\right)\right) \tag{7}$$

This is also the proportion of minority members in the population that assimilate. It is easy to see that this proportion is unambiguously increasing in V and θ^M, and decreasing in d, θ^m and q. This is the result of the direct effect of these parameters on G *(.)* and their effect through τ^*. The effect of the remaining parameters mimics the effect on τ^* with the opposite sign: the proportion of minority members that assimilates, increases in c and decreases in φ_0; the effect of the discount factor β is again ambiguous; for a given spread of the distribution, $\bar{t} - \underline{t}$, a decrease in $\underline{t}$, which generates a leftward shift of the distribution, decreasing its mean, but keeping the variance constant, is associated with an increase in *G(.)*; given $\underline{t}$, an increase in $\bar{t} - \underline{t}$, instead, decreases *G(.)*.

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]:

$$\begin{aligned} q_{t+1} - q_t &= -G\left((1-q_t)\theta^M V - q_t\theta^m V - d\tau_t^*\right) q_t \\ &= -\frac{(1-q_t)\theta^M V - q_t\theta^m V - d\tau_t^* - \underline{t}}{\bar{t} - \underline{t}} q_t \end{aligned} \tag{8}$$

[15]Recall that the mean of the uniform distribution is $\frac{\bar{t}+\underline{t}}{2}$, while the variance is $\frac{(\bar{t}-\underline{t})^2}{12}$.

[16]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 instant full assimilation.

[17]Assuming that no member of the majority acquires the minority trait is equivalent to assuming that $q\theta^{m,M}V - (1-q)\theta^{M,M}V - d^M\tau^M < \underline{t}^M$, where the superscript M (second superscript for the θ parameter) denotes the parameters for the majority. In other terms, for all members of the majority, the gain from more efficient transactions is exceeded by the combined costs of acquiring the minority trait.

with τ_t^* defined in (6). Equation (8) represents the dynamics of the system when $\underline{t} \leq (1-q_t)\theta^M V - q_t\theta^m V - d\tau_t^* \leq \bar{t}$. When $(1-q_t)\theta^M V - q\theta_t^m V - d\tau^* \leq \underline{t}$ nobody assimilates, $G(.) = 0$ and $q_{t+1} - q_t = 0$. This observation allows us to determine the possible steady state equilibria (where $q_{t+1} - q_t = 0$) and their stability properties. Consider first the value of q_t, $\tilde{q}$, such that $(1-\tilde{q})\theta^M V - \tilde{q}\theta^m V - d\tau* = \underline{t}$ so that there is no gain from assimilation. For greater (smaller) values of q the net gain is negative (positive). It is easy to show that (see Appendix 2 for details on the dynamics and on the steady-state equalibria):

$$\tilde{q} = \frac{\theta^M V - \frac{\varphi_0 d^2}{c(\bar{t}-\underline{t})} - \underline{t}}{\theta^M V + \theta^m V} \tag{9}$$

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. Recall that the equation of motion assumes that no member of the majority adopts the minority trait, which is reasonable if indeed we are dealing with a minority ($q_0 < \frac{1}{2}$). If $q_0 < \text{Min}(\frac{1}{2}, \tilde{q})$, the steady state equilibrium implies full integration ($q = 0$). 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. The phase line is upward-sloping and convex and it intersects the 45 degree line at 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 type of equilibria exist, one with full integration and one with no integration (associated, for instance, 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. Finally, it is easy to see 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, θ^M, with the size of the total surplus from the transaction, V, with the cost to the parents for the socialization effort, c, with an increase in $\bar{t} - \underline{t}$ for a given $\underline{t}$ (so that both its mean and variance increase). $\tilde{q}$ instead decreases with the penalty for an assimilated child of a minority parent from dealing with members of the minority , θ^m, with the effectiveness of the socialization technology, d, with the direct benefit to the parent of the child maintaining the original trait, φ_0, and with a shift to the right of the distribution of t_i (so that the mean increases for a given spread of the distribution). Note that the parent's discount factor, β, 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 τ, equation (5), is zero, i.e. there is no expected cost for the parent from the child assimilating. As a result, at $q = \tilde{q}$, β does not matter for τ^* and, hence, for $\tilde{q}$.[18]

[18]In the model we have considered the decision whether or not to assimilate along a single dimension,

Summarizing, our simple model can help us to 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 him, 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. Attitudes, such as trust, are likely to imply a large transaction gain for the child from assimilating. For other traits, such as deep religious attitudes, the transaction payoff from converging to the majority trait is likely to be smaller. Attitudes, such as those towards family values or gender roles, may imply large gains for the parents if the child maintains the minority trait, or a large cost for the child if he abandons her family's traditional values and beliefs. However, maintaining some of this traits or beliefs may come to a large cost for the child if they are not conducive to an active participation in the labor market. 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 the family 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 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 (22) waves of the GSS, starting in 1978 and ending in 2014. Each wave includes

that is a single attitude. The results however directly 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, as we have assumed so far. Assume that costs and benefits are additive and that there is no interaction between the two trais, that is *socialization* $c(\tau_1) + c(\tau_2)$ costs for the parents are and direct socialization benefits are $\varphi(\tau_1) + \varphi(\tau_2)$. Assume that switching costs are also additive for the child, $d(\tau_1)+d(\tau_2))$, and, to avoid multivariate distributions, that the two stochastic terms t_1 and t_2 are independent. Finally assume that the net benefits associated with each attitude are $\theta_a^{M*}(1-q_a)V_a - \theta_a^{m*}q_aV_a - d(\tau_a) - t_a$, $a = 1, 2$ again assuming lack of interaction. In this simple case the conditions for τ_1 τ_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 we leave this extension for future research.

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). For ease of interpretation, we have grouped attitudes (or questions) into several broad categories. The list of categories, variables, and coding choices is provided in Table 1. Group A deals with views on social life, social interactions, and cooperation. It includes questions about trustworthiness (*trust)*, fairness (*fair)*, and helpfulness of others *(helpful)*. Group B includes attitudes towards government intervention – should the government redistribute income (*eqwlth*), provide a safety-net for the poor (*helppoor*) – and overall political views (*polviews*). Group C surveys different 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 afterlife (*postlife*), and the approval of prayer in public schools (*prayer*). Group D includes attitudes about family and children. Questions in this group elicit 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*). Furthermore, this group includes views on preferred qualities in children such as obedience (*obey*) and independence (*thnkself*). Group E surveys views on gender roles. Participants in the GSS are asked to express their opinion concerning various statements describing the role of women in the labor market, in politics and at home: should a woman work even if the husband can support her (*fework*)?; can working mothers have a warm relationship with their children (*fechild*)?; women should take care of running the home while men run the country (*fehome*); women are not suited for politics (*fepol*). 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 elicit views on whether social mobility is a result of hard work versus help or luck (*getahead*).

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 because of 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.[19]

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 is 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 are 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 is born abroad. 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. The definition could, in principle, be made tighter by limiting our analysis to respondents who indicate only one country. This, however, would reduce substantially the number of observations, as only 50% percent of the sample chooses just one country. Therefore we will not pursue this option here.

[19]For other Southern and Eastern European countries and for the French we do not have enough observations, given the estimation strategy we will adopt in this version of the paper.

4 Recovering Country of Origin Effects for Different Generations, Dynasties and Time Periods

The way an individual perceives the world is shaped by the values and beliefs of his/her parents. The attitudes of one's parents are, in turn, shaped by their 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.[20] 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 and came 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:

$$Pr(y_t^i = 1) = \sum_{o \in O} \sum_{g \in G} \sum_{c \in C} \beta_{o,g,c} \left(I_{(Origin^i = o)} \times I_{(Generation^i = g)} \times I_{(Cohort^i = c)} \right) + \theta X_t^i \quad (10)$$

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 1; set G includes each of the four possible generations of immigrants; set C includes four groups of respondents – those born in the periods 1890-1914, 1915-1939, 1940-1964 and 1965-2000. The set of controls includes: income, education, mother's education, father's education, age, age^2, year-of-the-survey dummy, gender, number of children, marital status, work status, religion, regional indicators, and urbanization indicators. 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 education. Yet, we prefer to define country of

[20] Responses to each of the GSS questions are therefore re-coded to produce a binary outcome (see Table 1).

origin effects net of these factors, in an attempt to capture deeper cultural values and beliefs that go beyond personal characteristics and circumstances.[21] Consequently, the evolution of attitudes that this paper analyzes is not explained by changes in the level of education or income of immigrants over time. These individual controls are held constant when we compare changes of attitudes across different immigrants. Finally, note that we include survey-year effect 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 $o \in \{1,..,7\}$; $g \in \{1,..,4\}$; $c \in \{1890-1914, 1915-1939, 1940-1964, 1965-1990\}$.

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 dynasty of immigrants observable in our data* – the one that starts with the first generation arriving between 1890 and 1914 and ending with the last generation being born after 1965. The attitudes of the first generation of this dynasty — the one arrived in 1890-1914 — is captured by $\beta_{o,1,1890-1914}$, those of the second generation by $\beta_{o,2,1915-1939}$, those of the third generation by $\beta_{o,3,1940-1964}$, and, finally, those of the fourth generation (or higher) by $\beta_{o,4,1965-1990}$. For some countries the GSS does not have many respondents who are both first generation and belong to the cohort of 1890-1914. In order to have enough observations for the first generation of each country, we assume that the first generation of the 1890-1914 cohort and of the 1915-1939 cohort are characterized by the same coefficient ($\beta_{o,1,1915-39} = \beta_{o,1,1915-39}$). In Table 3, part one, we report the frequency of observations for each country, generation and cohort for the respondents of the question of trust. In Panel B we summarize the frequency of observations for the dynasty on which we focus.

5 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

[21] See also Algan and Cahuc (2007, 2010) and Giavazzi et al (2013). In our robustness section we also experiment with a more minimalist list of controls, including only age, age squared, year of the survey, gender, religion, regional indicators, and urbanization indicators.

the dominant culture. For each of the countries of origin we define

$$\widetilde{\beta}_{(o,g,c)} = \beta_{(o,g,c)} - \beta_{(ave,4,c)} \tag{11}$$

where $\widetilde{\beta}_{o,g,c}$ represents the difference of the 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) European immigrants from all European countries in our sample, $\beta_{ave,4,c}$. 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. To examine the experience of immigrants from different origins for the dynasty starting in the 1890-1914 period, we focus on two relationships. First, we compare $\widetilde{\beta}_{o,1,1890-1914}$ to $\widetilde{\beta}_{o,2,1915-1939}$, i.e. how the distance from the norm of the first member of the dynasty compares to the distance from the norm of the succeeding member 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 $\widetilde{\beta}_{o,1,1890-1914}$ to $\widetilde{\beta}_{o,4,1965-1990}$. We use this relationship to capture how the particular attitude of descendants changes from the first generation all the way to the fourth generation, relative to the respective norms.[22]

This methodology follows and extends the approach proposed by in Algan et al. (2012).[23] However, whereas they focus on the changes between the first and second generation, we analyze the evolution of attitudes over multiple generations. Most importantly, we keep the dynasty constant – only consider 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. $\widetilde{\beta}_{o,1,1890-1914}$ and $\widetilde{\beta}_{o,4,1965-1990}$). 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 the 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*

[22] We can also analyze the process of convergence between the first and third generation by comparing $\widetilde{\beta}_{o,1,1890-1914}$ to $\widetilde{\beta}_{o,3,1915-1939}$. 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.

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

converge from below, while points between the 45 degree line and the y-axis *monotonic divergence form below.* In Quadrant II, in which the difference relative to the norm is first negative then positive, the 135 degree line separates points of *divergent leapfrogging* (above it) from those representing *convergent leapfrogging* (below the line). Similarly, in Quadrant IV, 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.* This graph is useful to understand how the pattern of convergence differs for each cultural trait and each country.

We construct an overall index of convergence for each attitude by counting the proportion of countries that fall in the monotonic convergence from above or below, and in the convergent regression and 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* value of the distance from the norm going from the 1^{st} to the 4^{th} generation. Alternatively, we can do this for the 1^{st} and the 2^{nd} generation. We define the proportion of countries within these convergent region as π_{45}.

The drawback of π_{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 this end, 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 a third (π_{30}) or two thirds by generation 4 (π_{15}).

Note that this approach, particularly when using the π_{45} criterion, is related to β *convergence* as the latter focuses on whether the slope of the regression line of $\widetilde{\beta}_{o,4,1965-1990,}$ on $\widetilde{\beta}_{o,1,1890-1914}$ 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.

6 Results

In this section we present our results, using the definition of convergence based on the hourglass. We start by calculating the percentage of countries whose distance from the norm in generation four is less than half of the distance of their ancestor in generation one. We use this fraction to quantify the convergence that occurs in the particular attitude considered between the first and the fourth generation of the dynasty. We compare the convergence up to the fourth generation with that occurring between the first and the second generation. In this exercise we exclude Great Britain from the count because it plays a dominant role in defining the norm (with a weight of around 40%). After presenting the basic results, we will explore in the next section several robustness exercises and extensions, 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.

Finally, we shall also present evidence on the changing strength of the relationship between attitudes in the country of origin and immigrants' attitudes across generations. In particular we want to see whether and how the cultural distance of various generations of immigrants from the mother country *increases* for different traits. This last exercise is different from but complementary to what we do in the core of the paper, with our focus on whether or not the cultural distance between succeeding generation of immigrants and the US norm *decreases* for various attitudes.

In Table 4 we report the percentage of countries for which the initial gap has been cut at least in half ($\pi_{22.5}$ denotes this proportion) either going all the way to the fourth generation or by the second generation. In the table we order the attitudes from the slowest moving (top rows) to the fastest moving (bottom rows) in terms of our convergence criterion, going from the first to the fourth generation. Table 5 presents the results by attitude *and* country. Attitudes are organized in categories which facilitates the assessment of convergence of *groups* of attitudes. Importantly, this table allows us to assess whether or not there are country specificities in the process of convergence.

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: stopping at the 2^{nd} generation, as the literature has typically done, would miss the greater convergence of a number of attitudes. These can be seen comparing the percentage of countries converging by generation four (column 1) and by generation 2 (column 2) reported in Table 4. In approximately three quarter of the cases the percentage of convergent observations by the 4^{th} generation is larger than for the 2^{nd} generation (in the remaining cases there is either

no change or a slower convergence by the 4^{th}generation). When we focus on the average percentage of convergent cases for each group of attitudes, in all cases the percentage is larger for generation four compared to generation two (see the last columns of Table 5).

Focusing on the column of Table 5 for the average fraction of convergent cases by generation four, the ranking of *groups* of attitudes, from the slowest-moving to the fastest-moving are: Gender Role, Religion, Government and Politics, Family, Mobility/Success, Abortion, Cooperation, and Sexual Behavior. Note that the change in the proportion of convergent attitudes between the first and the second generation and the first and fourth generation is greater on average for the Cooperation and Sexual Behavior group. Moreover the 95% bootstrapped confidence interval does not include zero for Cooperation and, in this sense, we can reject the hypothesis of no change between the second and fourth generation. For the Sexual Behavior group the 95% confidence interval includes zero, but the 90% interval does not. The 95% confidence interval does not include zero also for the Family and Religion Group, but the change is smaller in size. It is even smaller and not significant for the remaining groups.

In terms of individual attitudes (see the first column of Table 4), the ones that converge more slowly by the fourth generation are those that describe some religious values such as prayer in public schools (*prayer*) and the frequency of personal prayer (*pray*), some family values and traditions concerning divorce, frequency of evenings spent with relatives and parental control on contraception (*divlaw*, *socrel*, and *pillok)* and views about the general role of women in society (*fehome:* the role of women is running the home, while men run the country) and the suitability of women for politics *(fepol).* General political views, and views towards the poor (*polviews* that distinguish conservative- from progressive-leaning individuals, and *helppoor*) also belong to this slow moving group. The next slowest group, in term of speed of convergence is mixed, containing views about women in market work (*fework)*, towards abortion without restrictions (*abany*) and the role of effort in getting ahead (*getahead*) [24]

Trust is among the fastest moving attitudes. It is the key attitude capturing cooperation. Interestingly, *trust* is one of the slow moving attitudes when one focuses on the change between the first and second generation. The group of fast-moving attitudes also contains attitudes toward children's independence (*thnkself and obey*), as well as homosexuality and

[24]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 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.

abortion with restrictions (*homosex* and *abrisk*). The next fastest convergence group contains the remaining attitudes towards cooperation (*fair* and *helpful*), *fechild* (whether or not a child suffer when the mother works), attitudes towards premarital sex (*premarsx*), some religious attitudes (such as *attend*, *reliten* and *postlife*) and *aged.* With regard to the latter, note that there is evidence that in the last decades there has been a return to a greater acceptance of sharing the home with grown children (see Fry 2014).

In conclusion, the summary convergence rates for groups of attitudes and for individual attitudes suggest that the slower moving ones are those connected with general gender views, general political views, and many (but not all) religious and family values. The fastest changing attitudes, instead, are those related to cooperation, sexuality, and children characteristics likely to determine their success in American society.

Lazear (1999) and Konya (2005), on which the child identity choice of our model is built, 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, as in Bisin and Verdier (2001). In our model the range of initial size of the minority for which full assimilation is the steady state equilibrium *and* the speed of assimilation in each period indeed increase with the net transaction gain.

This mechanism seems to be at work with many of our fast moving attitudes. For instance, there is much to be gained from sharing attitudes towards cooperation, as captured by *trust*, the fastest moving attitude: although there could be an initial gain from taking advantage of the trust of others, it is likely that the gain would be short-lived, followed by punishment if one is discovered cheating and not conforming to the social norm.[25] Moreover, even though the value attached to the ability of children to be independent, captured by *thnkself* and *obey,* are family attitudes, they affect the ability to profit from interacting with other members in a society, like the US, that greatly values independence. It is, therefore, not surprising to see that they are the *only* (very) fast moving family attitudes. The other family attitudes are instead more slow moving, which is fairly consistent with the spirit of our simple model.

Moreover, the fast convergence of views regarding the cost of women working in terms of

[25]See Guiso, Herrera and Morelli (2013) on how cultural clashes between countries (including the dimension of trust) may lead to the choice of inefficient policies once the countries join a union, with an application to the policy response to the Greek crisis.. There is also an extensive literature on the role of schools in shaping attitudes towards cooperation. See, for instance, Algan, Cahuc and Shleifer (2013) on the effect of teaching methods on beliefs underlining cooperation, and the references there on the effect of the quantity of schooling on social capital. Note that in deriving the country-generation effects we control for education of the respondent and of his/her parents.

the quality of the relationship with one's children can be explained by the large economic gains from having women participating in market work and the fact that generations of women have gradually learned about it.[26] Conversely, it is interesting that attitudes that have to do with women's general role in society and politics, relative to the home, move more slowly. Indeed many complex forces act on gender norms. Many authors (for instance, Goldin 2006 and Albanesi and Olivetti 2009) emphasize that technological innovations, structural change accompanying economic development, and medical improvements have had a powerful effect on gender roles in the labor market. Alesina, Giuliano and Nunn (2013), instead, find a persistent impact on gender norms today of the use of the plough as far back as a few millennia, even after accounting for the other factors mentioned above.

The fact that religious attitudes are on average slow to converge can be rationalized in terms of the less obvious net transaction gains that accrue from adaptation to the norm. However, it is not easy to explain why the speed of convergence of the belief in the after life (*postlife*) is greater than the one for the importance of personal prayer (*pray*), as they both capture deep religious attitudes. The fast evolution of *attend* and *religten* by the 4^{th} generation is more understandable in terms of the model, as they are embodied or likely to be embodied in public manifestations of one's belief. These are also attitudes for which conforming to the norm may confer social benefits. Gruber and Hungerman (2008) find that changes in shopping hours had a large impact on church attendance and conclude that this validates economic models of religiosity that highlight the importance of economic influences, such as the opportunity cost of church-going for religious participation. On the issue of redistribution, our results are broadly in line with those of Alesina and Fuchs-Schuendeln (2007), who find that this attitude can change rather rapidly. They differ instead from those of Luttmer and Singhal (2011) who present evidence that such attitudes are rather "permanent". It is true, however, than most political views tend to converge relatively slowly.

An interesting question is whether the probability that a cultural attitude converges or not depends upon how spread out across countries is the distribution of the trait in the first generation. Here the arguments may go both ways. Large differences in the first generation may make a movement towards the norm more advantageous; on the other hand it may be more difficult to reduce the distance. In our results the median initial standard deviation of the seven faster moving attitudes is larger than the median standard deviation for the slower moving ones (.45 versus .20). The difference in the standard deviation suggests that

[26] In our model, we do not allow for learning, See, however, Fernandez (2013) for a model of belief formation in which it takes time for people to update their beliefs about the implications for children's welfare of women working outside the home.

an initial larger dispersion may lead to faster convergence.

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 accurate for European immigrants to the US. Indeed, by the fourth generation, the majority of cultural attitudes of descendants of European immigrants has converged, consistently with *Assimilation Theory.* 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 terms, the temperature in the melting pot was hot, but not uniform throughout, as one would expect given the model of cultural transmission we have developed that emphasizes the fact that the speed of convergence is likely to differ across various attitudes.

Are there interesting country specificities in the pattern of convergence? The bottom row of Table 5 reports the total number of convergent attitudes by country. Ireland and Germany are the countries with the highest number of cases in which attitudes converge over the entire sample period. Mexico is at the bottom with Poland, while Italy and Scandinavia occupy intermediate positions. An interesting question is which factors can explain the number of convergent attitudes by country. For instance, one would expect, on average, that in countries of origin in which the family is a weaker social institution, direct transmission 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. Indeed there is a positive and significant rank correlation ($r = .62$) between the number of convergent attitudes and the average of the family coefficients for different countries of origin for the 1^{st} generation (weighted by the size of the 1^{st} generation in each period), taken as a proxy for the weakness of the family as an institution in the country of ancestry. However, this is not the only factor. The ease to learn English may also matter in acquiring other cultural traits. In our model this is captured by properties of the distribution of the stochastic component of the child 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[27]. The correlation with the number of changing attitudes is also significant (the rank correlation coefficient is .67). Finally, the number of convergent attitudes by country is negatively correlated ($r = -.47$) with a measure of residential segregation (See Borjas

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

1995)[28]. Although our model is silent on this issue as it does not include a residential choice, this is what one would expect since a neighborhood characterized by a high concentration of individuals from the same 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. All these results should be taken with a grain of salt given the small number of countries in our sample. The issue of how the composition of the neighborhood affects the evolution of attitudes at the individual level is a very important and interesting topic that we leave for future research.

7 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 criteria in terms of the definition of the convergence region? 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 all these questions, as we shall see in the next sub-sections, is yes.

Finally, in the last sub-section we investigate an issue that is important, though not directly related to our main result. In the paper we have investigated the convergence to the dominant norm across generations of immigrants. A different but interesting question is how do such attitudes relate, for succeeding generations, 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?

These two issues are related, but different: convergence (non convergence) to the norm in the US does not imply nor is implied by an increasing distance (non increasing distance) from the culture of the country of origin. 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 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. With this caveat in mind it is, however, interesting to present some evidence on the changing strength of the relationship between attitudes in the country of origin and attitudes of successive generations of immigrants.

[28]More precisely, 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 immigrants. Similar results are obtained using figures for the second generation.

7.1 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 A1 we present detailed results for the 4^{th} generation based on less or more stringent criteria for convergence: reducing that distance by any amount (π_{45}), by at least a third (π_{30}), and by at least two thirds (π_{15}). The (Spearman) rank correlation coefficients between the proportions of converging country-wave observations (by generation 4) in the baseline and those obtained using these alternative criteria are reported at the bottom of the table. All correlation coefficients with the ranking in our baseline case are very high (in excess of 80%). In other words the ranking of attitudes is robust to the degree of tightness of the convergence criterion and so are our general conclusions on the relative speed of convergence of different attitudes.[29]

7.2 Reducing the Set of Controls in the Probit Equation

In Table A2 we limit the set of common controls to include only age, age squared, year of the survey dummy, gender, religion, regional indicators, and urbanization indicators. Income, education, mother's education, father's education, number of children, marital status, and work status are excluded. The income and education level of a respondent will surely influence his/her attitudes. But both income and education (as well as the rest of the excluded individual controls) can be viewed as an outcome of factors encoded in the country-of-origin fixed effects. The main results in the paper focus on the ancestral influence on attitudes that cannot be explained by variations in income, education, and etc.. In this section we allow for the ancestral influence to capture these changes in individual characteristics as well. Our conclusions are largely unchanged. The Spearman rank correlation coefficients with our original ranking is 0.97.

7.3 Changing the definition of the Norm

In Table A3 we return to our baseline specification and experiment with changing the definition of the norm. More specifically we choose as reference point the fourth generation descendants of immigrants from Great Britain. The rank correlation coefficient with our original ranking is 0.78 and our conclusions remain largely the same. This should not be

[29]The Spearman rank correlation coefficient remains high for an even tighter convergence criterion, requiring that the original gap is cut by at least three quarters.

surprising since descendants of British immigrants represent a large share (around 40%) of the immigrants who are fourth generation (or higher).

7.4 Immigrants' Attitudes and Attitudes in the Country of Origin

As we have remarked in the introduction to this section, the relationship between the attitudes of succeeding generations of immigrants and those of individuals who have not migrated and kept living in the country of origin is related, but distinct from the main question investigated in this paper. A weakening (non-weakening) link with the original culture is neither a necessary nor sufficient condition for convergence (non-convergence) to the US prevailing norm. However, it is a very interesting issue and one the literature has often addressed, as do in this section.[30] We measure attitudes in the countries of origin using the European Value Survey (EVS) and the World Value Survey (WVS) which ask largely identical questions, some of which coincide or, more often, are similar to those asked in the GSS and used in our baseline results. The match 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, divlaw, fechild, fehome, fework,* and *abany* (See Table A4). 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, for each of these periods, we have estimated the coefficient of country-cohort specific dummies in a Probit model for each attitude, controlling for age, age squared, gender, and marital status.[31] In the second stage, we have then associated these country-cohort-specific effects with the data in each GSS survey, so that each individual as 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 each cultural attitude on the GSS data, as we did before, but replacing the period-origin-generation and origin-cohort dummies with the time varying and country specific cultural proxy 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 time 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.

The results are reported in Table 6. First, considering all attitudes, in seven out of twelve

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

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

cases the coefficients of the culture of the country of origin for the first or second generation are significant. The association is closest for the attitudes that bear a close correspondence in the actual question surveyed. This emphasizes the fact that an imperfect match between the EVS-WVS and the GSS questions is likely to lead us to underestimating the strength of the association with the culture of the country of origin. 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, as one would expect. For instance, in the case of *trust,* the coefficient decreases from .48 to .23, .18, .11 as we go from the 1^{st} to the 4^{th} generation, and remains significant (or almost so) at conventional levels from the 1^{st} to the 4^{th} generations. A similar pattern is displayed by *attend, pray, thnkself, fechild*, and, to some extent, by *divlaw and homosex.* Five of the attitudes displaying this decaying pattern are in the top half of the distribution in terms of convergence speed, according to our preferred criterion.

8 Conclusions

Do cultural traits persist relatively unchanged over long periods of time, or do they converge rather rapidly to a country's prevailing norm? In this paper we have presented new evidence on this question by analyzing cultural attitudes of different generations of European immigrants to the US and we have provided a simple model to shed light and interpret the evidence on the speed of convergence.

We show that persistence is not the same across cultural traits. Some traits converge slowly to the prevailing norm: this is the case, for instance, of some family and gender values, political views, and deep personal religious values. Other traits, instead, show a faster pace of convergence: this is true, for example, for attitudes towards cooperation (the trustworthiness and helpfulness of others), children's independence, and attitudes towards sexuality, and also attitudes towards the effect of women's work on the child-mother relationship. Slow-moving attitudes are mostly the ones for which direct transmission within the family is likely to be more important and effective. Fast-changing ones are those for which the benefits of assimilation as a result of economic and social interactions are greater and the switching costs smaller.

Importantly, we show 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 "culture specific" in the sense that the country from which one's ancestors came matters for the pattern of generational convergence (or lack

thereof).

The implication of our results for the debate about the "melting pot" is that the latter was certainly at work for European immigrants for many-cultural traits and beliefs. However, descendants of immigrants from different countries of ancestry have maintained over several generations a degree of cultural distinctiveness along some other traits. 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. In this last respect, our results also show that the overall pattern of convergence differs across countries of origin in a manner largely consistent with the model predictions.

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 could be fertile ground for future research.

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 $x_{GSS} < 4$)
	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 $x_{GSS} < 3$)
	fehome	women should take care of running homes (y=1 for no if $x_{GSS} = 2$)
	fepol	women not suited for politics (y=1 for no if $x_{GSS} = 2$)
	fework	women should work even if husband can support them (y=1 for yes if $x_{GSS} = 1$)
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 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. $abrisk = abhlth \cap abrape \cap abdefect$. x_{GSS} denotes the numerical value of the answers to the GSS questions. Some allow for a gradation of response.

9 Tables and Figures

Table 2: Country Groups

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

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

	Cohort 1890-1915				Cohort 1916-1940				Cohort 1941-1965				Cohort 1966+			
	Gen1	Gen2	Gen3	Gen4	Gen1	Gen2	Gen3	Gen4	Gen1	Gen2	Gen3	Gen4	Gen1	Gen2	Gen3	Gen4
GER	12	67	54	112	47	83	308	639	63	86	340	1,528	32	39	62	587
POL	13	40	3		15	89	60	15	25	29	203	75	7	8	21	68
SCA	10	58	12	4	12	74	127	71	16	28	179	295	6	3	21	124
IRE	7	29	25	106	12	57	161	508	26	44	230	1,115	11	19	51	483
ITA	19	48	2	1	38	186	75	13	36	80	380	157	8	34	78	202
UK	19	38	48	208	61	87	124	1,046	68	81	163	1,460	22	19	28	461
MEX	1	3		3	28	45	13	12	144	105	85	72	270	170	43	77

	Dynasty 1890			
	Gen1	Gen2	Gen3	Gen4
GER	59	83	340	587
POL	28	89	203	68
SCA	22	74	179	124
IRE	19	57	230	483
ITA	57	186	380	202
UK	80	87	163	461
MEX	29	45	85	77

Table 4: Convergence by Cultural Attitude: Comparing Generation 4 and 2

	Gen 4 $\pi_{22.5}$	Gen 2 $\pi_{22.5}$	(Gen 4 $\pi_{22.5}$ - Gen 2 $\pi_{22.5}$)
prayer	17%	17%	0%
socrel	17%	17%	0%
pray	33%	17%	17%
divlaw	33%	0%	33%
fehome	33%	33%	0%
polviews	50%	50%	0%
pillok	50%	33%	17%
helppoor	50%	67%	-17%
fepol	50%	33%	17%
fework	67%	50%	17%
abany	67%	83%	-17%
getahead	67%	83%	-17%
attend	83%	67%	17%
aged	83%	33%	50%
eqwlth	83%	33%	50%
fair	83%	17%	67%
fechld	83%	67%	17%
helpful	83%	33%	50%
reliten	83%	50%	33%
postlife	83%	50%	33%
premarsx	83%	50%	33%
trust	100%	33%	67%
abrisk	100%	83%	17%
obey	100%	50%	50%
homosex	100%	50%	50%
thnkself	100%	33%	67%

Notes: Percentage of country-wave observations for which the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 2 or 4

Table 5: Convergence by Cultural Attitude and Country

		GER	POL	SCA	IRE	ITA	MEX	Total	Gen 4 $\pi_{22.5}$	Gen 2 $\pi_{22.5}$	$\triangle$	90% CI	95% CI
Group A - Cooperation	trust	1	1	1	1	1	1	100%	89%	28%	61%	(22%, 61%)	(17%, 61%)
	fair	1	1	1	1	1	0	83%					
	helpful	1	1	0	1	1	1	83%					
Group B - Government/Politics	eqwlth	1	1	0	1	1	1	83%	61%	58%	11%	(0%, 39%)	(-6%, 44%)
	helppoor	1	0	1	1	0	0	50%					
	polviews	0	1	0	1	1	0	50%					
Group C - Religion	attend	1	1	1	1	0	1	83%	60%	40%	20%	(7%, 40%)	(3%, 40%)
	pray	0	0	0	1	0	1	33%					
	reliten	1	1	1	1	1	0	83%					
	postlife	1	0	1	1	1	1	83%					
	prayer	0	0	0	1	0	0	17%					
Group D - Family	thnkself	1	1	1	1	1	1	100%	64%	28%	36%	(17%, 40%)	(14%, 47%)
	obey	1	1	1	1	1	1	100%					
	pillok	1	0	1	0	1	0	50%					
	aged	1	1	0	1	1	1	83%					
	divlaw	1	0	1	0	0	0	33%					
	socrel	0	0	0	1	0	0	17%					
Group E - Gender Roles	fechld	1	1	0	1	1	1	83%	58%	46%	12%	(-4%, 29%)	(-8%, 33%)
	fehome	1	0	1	0	0	0	33%					
	fepol	0	0	1	1	0	1	50%					
	fework	1	1	0	1	1	0	67%					
Group F - Abortion	abany	1	0	0	1	1	1	67%	83%	83%	0%	(-8%, 42%)	(-8%, 42%)
	abrisk	1	1	1	1	1	1	100%					
Group G - Sexual Behavior	premarsx	1	1	1	1	0	1	83%	92%	50%	42%	(.01%, 50%)	(0%, 50%)
	homosex	1	1	1	1	1	1	100%					
Group H - Mobility/Success	getahead	1	0	1	1	1	0	67%	67%	83%	-16%	(-17%, 50%)	(-17%, 67%)
		81%	58%	62%	88%	65%	58%						

Notes: The figures in the table represent the number of times we observe convergence for each country and each attitude. 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). The last two columns report the bootstrapped 90% and 95% confidence intervals, based on 500 replications estimating the Probit equation, based on stratified sampling with replacement in the country-generation-cohort cells.

Table 6: The Impact of European Attitudes on US Immigrants across Generations

	$Cult_o \times I_{(g=1)}$	$Cult_o \times I_{(g=2)}$	$Cult_o \times I_{(g=3)}$	$Cult_o \times I_{(g=4)}$
trust	0.48	0.23	0.18	0.11
	(5.21)	(3.06)	(2.80)	(1.82)
attend	0.18	0.02	0.06	-0.01
	(4.12)	(0.54)	(2.73)	(-0.76)
pray	0.38	0.09	0.02	-0.02
	(3.81)	(1.27)	(0.35)	(-0.62)
postlife	0.07	-0.13	0.18	0.00
	(0.39)	(-1.24)	(2.57)	(-0.08)
thnkself	0.65	0.24	-0.06	0.02
	(4.15)	(2.19)	(-0.66)	(0.38)
obey	-0.15	0.13	0.05	-0.17
	(-0.77)	(0.74)	(0.47)	(-3.16)
divlaw	0.09	0.16	0.02	-0.01
	(0.99)	(2.13)	(0.35)	(-0.15)
fechild	0.28	0.09	0.05	0.06
	(2.25)	(1.17)	(0.81)	(1.32)
fehome	-0.19	0.10	0.14	0.03
	(-1.56)	(0.97)	(1.40)	(0.40)
fework	0.09	-0.02	0.02	-0.03
	(1.05)	(-0.25)	(0.28)	(-0.61)
abany	-0.01	-0.01	0.01	0.03
	(-0.13)	(-0.23)	(0.28)	(0.88)
homosex	0.12	0.12	-0.02	0.07
	(1.38)	(1.81)	(-0.42)	(1.50)

Notes: $Cult_o$ denotes the culture of the country of origin. Generation specific coefficients are reported. z statistics in parentheses.

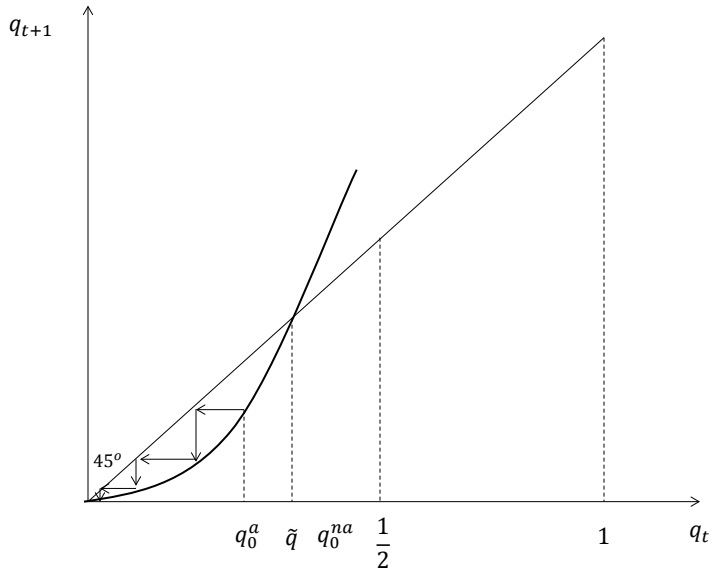

Figure 1a: Dynamics and Equilibria: Full Assimilation and Non-assimilation Equilibrium

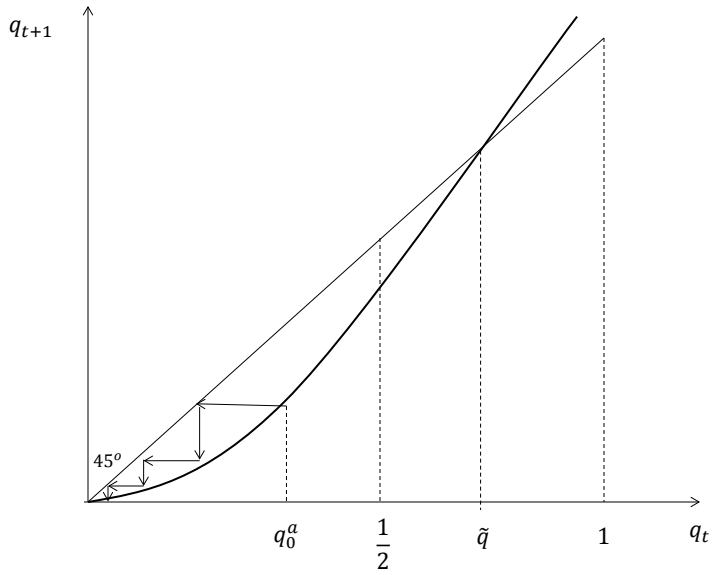

Figure 1b: Dynamics and Equilibria: Only Full Assimilation Equilibrium

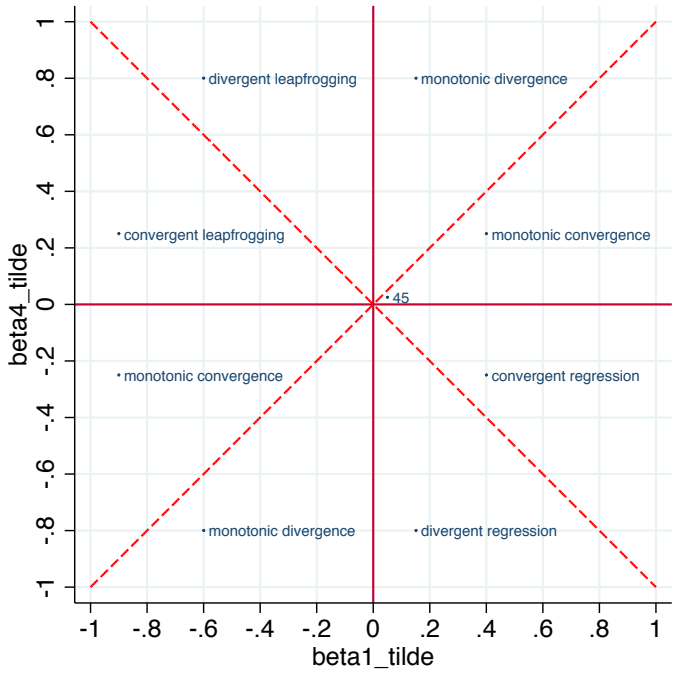

Figure 2a: Generational Convergence and Non-convergence Regions (by type)

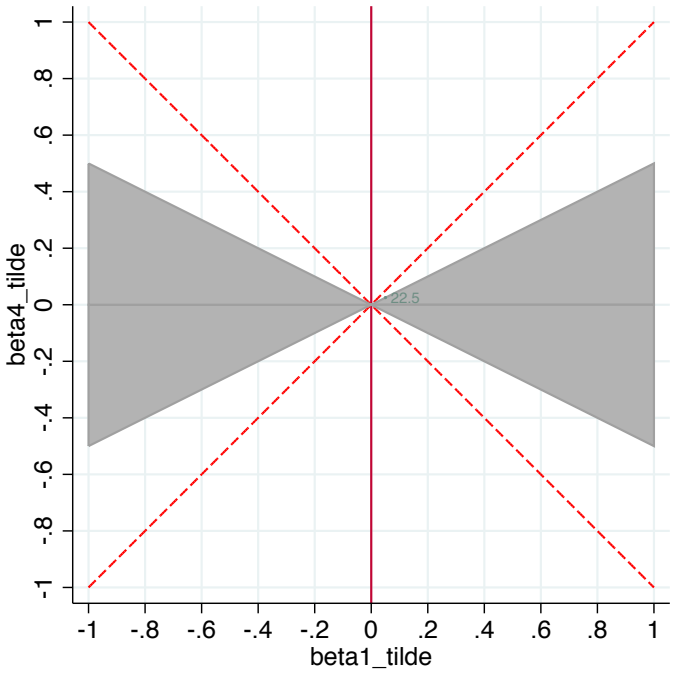

Figure 2b: Convergence Region Implied by the 22.5^o Cut-off Rule

Table A1: Sensitivity of Convergence Across Different Criteria

	π_{45}		π_{33}		$\pi_{22.5}$		π_{15}
prayer	33%	prayer	17%	prayer	17%	divlaw	0%
fehome	33%	socrel	17%	socrel	17%	socrel	0%
polviews	50%	pray	33%	pray	33%	prayer	17%
socrel	50%	fehome	33%	divlaw	33%	polviews	33%
helppoor	67%	helppoor	50%	fehome	33%	pray	33%
pray	67%	polviews	50%	polviews	50%	fehome	33%
fework	67%	pillok	50%	pillok	50%	fepol	33%
getahead	67%	divlaw	50%	helppoor	50%	helppoor	50%
reliten	83%	fepol	67%	fepol	50%	helpful	50%
postlife	83%	fework	67%	fework	67%	pillok	50%
pillok	83%	abany	67%	abany	67%	eqwlth	50%
divlaw	83%	getahead	67%	getahead	67%	abany	50%
fechld	83%	attend	83%	attend	83%	premarsx	50%
fair	83%	aged	83%	aged	83%	homosex	50%
fepol	83%	helpful	83%	eqwlth	83%	getahead	50%
attend	83%	fair	83%	fair	83%	attend	67%
abany	83%	fechld	83%	fechld	83%	fework	67%
helpful	83%	eqwlth	83%	helpful	83%	fechld	83%
trust	100%	reliten	83%	reliten	83%	reliten	83%
aged	100%	postlife	83%	postlife	83%	trust	83%
thnkself	100%	premarsx	83%	premarsx	83%	fair	83%
eqwlth	100%	trust	100%	trust	100%	thnkself	83%
abrisk	100%	abrisk	100%	abrisk	100%	abrisk	83%
premarsx	100%	obey	100%	obey	100%	obey	83%
homosex	100%	homosex	100%	homosex	100%	postlife	83%
obey	100%	thnkself	100%	thnkself	100%	aged	83%

Rank Correlation

	π_{45}	π_{30}	$\pi_{22.5}$	π_{15}
π_{45}	1.00			
π_{30}	0.87	1.00		
$\pi_{22.5}$	0.84	0.95	1.00	
π_{15}	0.61	0.81	0.85	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 (π_{45}), by a third (π_{30}), by half ($\pi_{22.5}$), and by two thirds (π_{15}) by generation 4. The second table lists the rank correlations between the different convergence criteria.

Appendix 1

Table A2: Limited Controls: Convergence by Cultural Attitude: Comparing Generation 4 and 2

	Gen 4 $\pi_{22.5}$	Gen 2 $\pi_{22.5}$	(Gen 4 $\pi_{22.5}$ - Gen 2 $\pi_{22.5}$)
prayer	17%	17%	0%
socrel	17%	17%	0%
pray	33%	17%	17%
divlaw	33%	0%	33%
fehome	33%	33%	0%
polviews	50%	50%	0%
pillok	50%	33%	17%
helppoor	50%	67%	-17%
fepol	50%	33%	17%
fework	67%	50%	17%
abany	67%	83%	-17%
getahead	67%	83%	-17%
attend	83%	67%	17%
aged	33%	83%	50%
eqwlth	83%	33%	50%
fair	83%	17%	67%
fechld	83%	67%	17%
helpful	83%	33%	50%
reliten	83%	50%	33%
postlife	83%	50%	33%
premarsx	83%	50%	33%
trust	100%	33%	67%
abrisk	100%	83%	17%
obey	100%	50%	50%
homosex	100%	50%	50%
thnkself	100%	33%	67%

Notes: This table replicates Table 4 using a limited set of controls. Percentage of country-wave observations for which the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 2 or 4.

Table A3: UK Benchmark: Convergence by Cultural Attitude: Comparing Generation 4 and 2

	Gen 4 $\pi_{22.5}$	Gen 2 $\pi_{22.5}$	(Gen 4 $\pi_{22.5}$ - Gen 2 $\pi_{22.5}$)
prayer	0%	0%	0%
socrel	17%	17%	0%
fehome	17%	50%	-33%
divlaw	33%	0%	33%
fepol	33%	33%	0%
pray	50%	17%	33%
reliten	50%	50%	0%
postlife	50%	50%	0%
pillok	50%	33%	17%
helpful	50%	50%	0%
premarsx	50%	33%	17%
attend	67%	83%	-17%
eqwlth	67%	33%	33%
polviews	67%	17%	50%
helppoor	67%	50%	17%
fework	67%	50%	17%
abany	67%	83%	-17%
getahead	67%	67%	0%
obey	83%	50%	33%
fair	83%	17%	67%
homosex	83%	50%	33%
fechld	83%	67%	17%
abrisk	100%	50%	50%
trust	100%	17%	83%
thnkself	100%	50%	50%
aged	100%	50%	50%

Notes: This table replicates Table 4 using the attitude of the fourth generation of UK immigrants as a benchmark. Percentage of country-wave observations for which the absolute value of the deviation from the norm has been cut at least in half between generation 1 and generation 2 or 4.

Table A4: 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 $x_{EVS} = 0$)
divlaw	f121	Justifiable: divorce (y=1 for yes if $x_{EVS} > 3$)
fechild	d061	Pre-school child suffers with working mother (y=1 for yes if $x_{EVS} > 2$)
fehome	d057	Being a housewife just as fulfilling (y=1 for no if $x_{EVS} > 1$)
fework	d058	Husband and wife should both contribute to income (y=1 for yes if $x_{EVS} = 1$)
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.

Appendix 2: Phase Diagram and Location of $\tilde{q}$

Re-writing equation (8) in the text, the dynamics of assimilation is determined by:

$$q_{t+1} = \left(1 - \frac{(1-q_t)\theta^M V - q_t\theta^m V - d\left(\frac{\varphi_0 - \beta[(1-q_t)\theta^M V - q_t\theta^m V - \underline{t}]}{\frac{c(\bar{t}-\underline{t})}{d} - \beta d}\right) - \underline{t}}{\bar{t} - \underline{t}} \right) q_t \qquad \text{(A1)}$$

$$\frac{dq_{t+1}}{dq_t} = \left(1 - \frac{(1-q_t)\theta^M V - q_t\theta^m V - d\left(\frac{\varphi_0 - \beta[(1-q_t)\theta^M V - q_t\theta^m V - \underline{t}]}{\frac{c(\bar{t}-\underline{t})}{d} - \beta d}\right) - \underline{t}}{\bar{t} - \underline{t}} \right) + \left(\frac{\theta^M V + \theta^m V + \beta d \frac{[\theta^M V - q_t\theta^m V]}{\frac{c(\bar{t}-\underline{t})}{d} - \beta d}}{\bar{t} - \underline{t}} t \right) q_t > 0 \qquad \text{(A2)}$$

$$\frac{d^2 q_{t+1}}{dq_t^2} = \frac{2c(\theta^M V + \theta^m V)}{c(\bar{t} - \underline{t}) - \beta d^2} > 0 \qquad \text{(A3)}$$

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 $(1-\tilde{q})\theta^M V - \tilde{q}V\theta^m V - d\tau^* = \underline{t}$,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:

$$\tilde{q} = \frac{\theta^M V - \frac{\varphi_0 d^2}{c(\bar{t}-\underline{t})} - \underline{t}}{\theta^M V + \theta^m V} \qquad \text{(A4)}$$

The numerator of the first line on the right hand side of (A4) is strictly positive, because we assume that $(1-q)\theta^M V - q\theta^m V - d\tau^* \geq \underline{t}$ which implies that $(1-q)\theta^M V - q\theta^m V - \frac{\varphi_0 d^2}{c(\bar{t}-\underline{t})} - \underline{t} \geq 0$. Hence $\tilde{q} > 0$. The numerator and denominator of (A4) also imply that $\tilde{q} < 1$. Therefore, $0 < \tilde{q} < 1$ as claimed in the text.

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