Schooling and Intergenerational Transmission of Values

by
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Abstract

We present a model of the evolution of identity via dynamic inter-
action between the choice of education and the transmission of values
in a community from parents to children, when parents care about the
preservation of their traditional community values, different from the val-
ues of the host society. We compare the educational and socio-economic
outcomes in different scenarios (melting pot versus multiculturalism). If
schooling shifts children's identity away from their parents' values par-
ents may choose lower levels of education for their children, at the cost
of reducing their future earnings. We show how this effect can be attenu-
ated and reversed when the school or, indeed, the host society are willing

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to accommodate the values of the community and/or to adjust to these values; otherwise the community gradually becomes alienated. This approach may be applied to the analysis of temporal changes in values and attitudes in a community of immigrants, as well as ethnic, religious, or other minority groups.

Key words: values, education policies, overlapping generations.

JEL classification numbers: I20, J15, H8

1   Introduction

Immigration has featured as an increasingly important political issue in European debates over the past two decades, and the integration of migrants into their host societies is a subject raising anxieties both in the recipient countries and amongst the migrants themselves. In the United Kingdom, nearly three quarters of teachers (72%) regard the promotion of British values as part of a teacher's role, with one in five teachers (21%) seeing this as a central part, according to YouGov research, commissioned by Teachers TV. This is despite the fact that the poll, published to coincide with a week of programming dedicated to Britishness and culminating in a debate on the issues, found that there were a significant proportion of teachers (36%) who did not identify strongly as being British.[1] When the opportunities offered to the migrants' children by the

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[1] Press release of Teachers TV published online (http://www.teachers.tv/node/29223). Research was conducted online by YouGov Plc between 17th and 22nd September 2008. YouGov interviewed 643 primary and secondary school teachers. Results have not been weighted. YouGov is a member of the British Polling Council.

education systems of host countries entail embracing a system of values radically different from their own, it is not uncommon that changes in children's values under the school's influence is a source of frustration for parents, causing tensions not only within the family but also between the community and the host society. This paper is an attempt to model how the values of the host society, promoted by the system of education, and the traditional values of a community of, say, ethnic minority, inculcated within the family, interact in shaping the identity of the new generation of the community members, and how this process may evolve and affect the subsequent generations. In doing so, we also provide a template to discuss the dynamic interaction between the values of minority communities and the societies in which they are located.

There exists a large economic literature looking at the social and economic position of migrants and their children in Europe and North America (for a comprehensive review see Corak, 2004; and for a recent study of the Canadian case see Aydemir et al, 2008 and 2009). The common finding is that some socioeconomic outcomes are transmitted from immigrant parents to their children, though convergence to host society outcomes also occurs over time. For example, recently Blau et al (2008), using a sample of second- generation women in the US, found that their education, labour supply and fertility are significantly affected by those of the immigrant generation. They also find that whilst after two generations education and labour supply converge to those of the host population (between 4 and 13 per cent of education and between 3 and 4 per cent of labour supply shortfall), fertility shows instead more persistence (between 16

and 42 per cent of excess fertility remains).

Research on the development of ethnic identity by immigrants (Constant et al., 2009) shows that values are important to the process of creating an ethnic identity and the latter is then an important determinant of economic behaviour. Constant and Gataullina define ethnic identity as '*the balance between commitment or self-identification with the culture and society of origin and commitment or self-identification with the host culture and society, achieved by an individual after migration*' (p.276), and discuss possible outcomes of the process in terms of assimilation (cultural and social conformity), integration (strong identification with ethnic culture and social conformity to host society), marginalisation (weak cultural identification and weak social conformity), and separation (strong identification to culture of origin and weak involvement in host society). The study uses the data from the German Socio-Economic Panel 2000-2002 to investigate the relationship between the ethnic identity outcomes (on the basis of language use, cultural aspects, ethnic networks, migration history and ethnic self-identification) and the individual's current age, age at entry, religion, education levels and entry origin for a sample of immigrants from different countries and finds that schooling in the home country overall keeps migrants inflexible towards adjustment and creates separation, although immigrants with college and higher degrees, especially if younger, integrate in the host society better, while retaining their ties with their ethnic identities. Immigrant parents have consistently been found in the psychological literature to hold on to their cultural values more strongly than their children, and to have more difficulties adapt-

ing to new cultures and learning new languages: this pattern has been defined 'dissonant acculturation' (Portes, 1997). This affects both the distance between immigrant parents' and their children's values, and the way immigrants shape their expectations regarding their children: For example, Reese (2001) discusses the adaptive struggle faced by Mexican immigrants in the United States trying to raise children who would do well economically but not fall prey to the 'moral dangers' of the host society. These processes are not uniform across immigrant communities and depend on a host of factors, including children's gender: Patel et al (1996), for example, show for the case of Gujarati immigrant families in the US that parental attitudes and behaviour are affected differently by factors such as modernity, acculturation, and time in the US, depending on parent's and child's gender. As a part of the International Comparative Studies of Ethnocultural Youth (ICSEY) project, Phinney et al (2000) investigated broad value discrepancies amongst parents and adolescent children in three immigrant (Armenian, Mexican, and Vietnamese) and two non-immigrant groups of families (African American and European American) in Southern California (an area with the highest rate of immigration in the US), assessing parents and adolescents independently. The authors maintain that the discrepancy may have different implications for nonimmigrant and immigrant families, and a conflict may well be more disruptive for the latter. The greatest intergenerational discrepancy exists amongst Vietnamese immigrants, which the authors explain by the fact that Vietnamese immigrants tend to live in the smallest immigrant communities. Thus, Vietnamese immigrant adolescents have on average both

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lower levels of ethnic language proficiency and intra-group social interaction, compared to other ethnic groups (see also Phinney et al 2001). In the European context, Drbohlav and Dzúrová (2007), using Berry's acculturation strategies model and Portes and Zhou's (1993) segmented assimilation model, discuss the mode of inclusion into Czech society of immigrant groups and its relation to their level of satisfaction of the immigrants with their new lives. Their findings suggest that the immigrants' inclusion in Czech society in Prague has developed into specific modes: Ukrainians are typical of their specific transnationalization patterns, Vietnamese represent a well-off but separated and segregated community, and Armenians practice a clear assimilation strategy, while approaching the mainstream in terms of socio-economic status. The immigrants most satisfied with their quality of life are those for whom it is not important to live close to their compatriots and those whose knowledge of the spoken Czech language is above average. The least satisfied are those who prefer to live close to their compatriots, those with university education, and those with a low income.

These and similar findings in the socio-economic literature provide an evidence of a process of values transmission across generations, influenced by the values of the host society and mediated by various policy channels addressing social inclusion. In this paper we concentrate on the effect of education; in particular, the mitigation of the degree of conformity with school norms by the conformity with community norms (a reflection of the ethnic and social mix of the neighbourhood of residence).

The importance of both family and school for the development of values is

well documented in economic and sociological literature. Akerlof and Kranton (2002) address the role of school norms and students' background in determining educational outcomes, given the amount of resources devoted to education. In their model the effectiveness of resources depends on the interaction between resources used and student formation of academic identity. The basis for their model is found in the sociological literature which suggests that student motivation may derive from ethnic background (which also influences levels of school funding) and match with the school. Conversely, positive developmental outcome from cross-racial and cross-ethnic friendships at school have emerged from empirical studies in developmental psychology (see Kawabata and Crick, 2008), and the influence of school rules, particularly relational ones, on children's values is well documented in the educational literature (see Thornberg, 2008). Hoffmann and Dufur (2008) use the data from the 1990 National Educational Longitudinal Study and the 1994–1995 National Longitudinal Study of Adolescent Health to support the claim that family environment and school-based social environment may serve as substitute or complementary forms of capital in forming the behaviour of students, in particular, youth delinquency.

Social norms and values have long featured in explanations of individual and group behaviour by economists, from the early work on social norms and conformism by Akerlof1(980) and Jones (1984) to the recent contribution on status by Besley and Ghatak (2008), among others. At the same time, the role of identity in individual welfare and decision-making has only relatively recently featured in economic models. Our approach falls within the tradition of the

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economics of social norms and identity (Akerlof and Kranton, 2000) in which norms act as motivating devices and the inherent sociability of humans creates a loss of utility from not conforming with the prevailing norms. In our model the frame of reference for each generation are the norms of their parents and those of the host society. The key assumption in our model of two-way interaction of values between a minority community and the host society are based on studies of education and transmission of values in the minority communities conducted in psychology, sociology and economics. In this paper we aim to address policy issues related to education, immigration and social inclusion.

We focus on the interaction between the values of the community and the host society through the system of education, while explicitly considering how specific policy parameters can affect the degree of assimilation of individuals in their society, as well as the degree of integration between immigrant (or minority) and host society. This gives an additional, policy angle to our approach and distinguishes our model from a number of positive studies, in the spirit of Bisin and Verdier (2001). For example, in Saez-Marti and Sjogren (2008) the evolution of values follows a probabilistic rule and is affected by peers as well as the parents. In a similar probabilistic framework, Corneo and Jeanne (2009a,b) explore the endogenous emergence of tolerance in a heterogenous society; they also analyze how the evolution of values affects the economic growth and development through the occupational choice. The difference between their and our approaches is also in the source of the alternative values; we believe that indoctrination through the schooling system is no less important than informal

peer pressure, and furthermore, if much of the interaction with peers occurs within school, the policies of the latter with regards to the diversity and related issues can have a strong influence upon the attitudes of the peers. Dasgupta and Kanbur (2005, 2007) consider a similar interaction between the values of two co-existing communities. In their framework values are modelled as a local public good, with members of the community affecting them directly by choosing their contributions towards its provision. In our model the behaviour of agents affects the values indirectly, through the choice of education. The decision problem here is intertemporal, and this allows, in line with Akerlof's work on endogenous social norms (Akerlof, 1980), to derive the dynamic path of the endogenous change in values over time, which has not been done in the literature before, to the best of our knowledge. In addition to processes affecting intergenerational value transmission in a minority community (migrants, ethnic or religius groups), we model the forces governing the assimilation of their values by the host society, and show how convergence of values can be achieved.

Our theoretical analysis describes how values change across generations when children's values are shaped both by their families and their schooling, so that the norms of reference for each new generation are different from those of the previous one. To our knowledge, there is no longitudinal dataset currently available which would provide sufficient amount of data on individual and socio-economic characteristics of migrants, to test the empirical implications of the model (see Joshi, 2008 for the representation of ethnic minority groups in UK cohort studies). Examples of rich datasets on immigrants are ICSEY mentioned

above, and the current TIES study. The former is a multi-country survey of immigrant parents and their adolescent children. The latter is a comparative research project on the descendants of immigrants from Turkey, the former Yugoslavia and Morocco who live across eight European countries: Austria, Belgium, France, Germany, the Netherlands, Spain, Sweden and Switzerland, surveying second generation immigrants aged 18-35. Whilst these projects provide a large number of interesting details they give only a one-time snapshot. Thus, testing for an empirical evidence of the intertemporal interaction between schooling and the values transmission is necessarily limited. Nevertheless, the results of the numerical simulations of the model are qualitatively consistent with the observed patterns, even though it was not possible to calibrate the model for the lack of the proper data.

In the next section we present our model and characterize the equilibrium. Section 3 presents the results of numerical simulations. In Section 4 we discuss some policy implications and conlude.

2 The Model

Consider a community of families whose traditional values differ from the values of the society outside the community, or the external values. This can be a community of immigrants, a religious minority, etc. To analyze the dynamics of the changes in the traditional values when the new generations are exposed to the external values, in particular, through schooling, we use a two-period overlap-

ping generations model. There is no population growth. A community member of generation t is an adult born in period $t-1$; from now on they are referred to as 'agent t'. In the first period of life each individual receives education in the amount chosen by their parent. In the second period each individual works and divides their earnings between consumption and investment in education of their offspring (there is no bequests). The education system is maintained by the host society and performs two roles, an academic and a social one. Firstly, it enhances a student's skills and, therefore, increases his or her future labour earnings. Secondly, it promotes the values of the host society and, therefore, affects the identity of a student. Parents care about their offsprings' future wealth, as well as about preserving traditional values of the community. In particular, they dislike their children's values deviating from the values currently prevailing in the community.

We assume that the values of an agent t are summarized by a one-dimensional parameter, θ_t. In period t the values of the community are the average of the values of all adult members of this community. Note that θ can be thought of as an aggregate of a number of factors, e.g. respect for elderly, status of women in the family, tolerance to pre-marital relationships, religiosity, etc., – rather than a measure of strength of any such particular custom or institution, – such that the difference in θ between two generations (or between two societies) reflects how one perceives oneself different from the other.

The preferences of agent t are described by the following utility function:

$$U_t = u\left(x_t\right) + v\left(w_{t+1}\right) - g\left(\left[\theta_{t+1} - \theta_t^C\right]^2\right);$$

we impose the standard assumptions: $u', v', g' > 0$, $u'', v'' > 0$, and $g'' > 0$. Here x_t is agent t's level of consumption, w_{t+1} is the wealth (here equal to the labour earnings), of agent t's offspring, i.e. that of an individual born and educated in period t; and θ_{t+1} is the offspring's future identity (their position on the scale of values when adult); thus, $\left[\theta_{t+1} - \theta_t^C\right]^2$ is the (squared) distance between the future generation's values and the current community values. We assume $g(0) = 0$ and $g > 0$ everywhere else. The magnitude of θ_{t+1} depends on the amount of education received by the child, e_t, as well as the parent's values, θ_t, and the values prevailing in the host society and promoted by the schooling system, θ_t^H. We model θ_{t+1} as a weighted sum of θ_t and θ_t^H:

$$\theta_{t+1} = [1 - \lambda(e_t)]\theta_t + \lambda(e_t)\theta_t^H. \tag{1}$$

We make the following assumption on the weighting function, $\lambda(e_t)$:

$$\lambda(0) = 0, \ \lambda'(0) > 0, \lambda''(\cdot) \leq 0.$$

Thus, when community members are not exposed to education outside the community their values do not change (this assumption is consistent with findings from longitudinal studies of immigrant children's values discussed in our literature review). Moreover, we allow for the effect of the host society's values changing non-monotonically with education; in particular, it may take an inverted-U shape, – in line with findings in the developmental psychology and education literature, this means that primary schooling strongly instills the host society values, whilst higher education promotes the development of a critical outlook and to re-evalution of personal attitudes and values.

The optimization problem of agent t is to maximize their utility, U_t, by choosing their consumption level and the amount of education for their offspring, subject to the budget constraint,

$$w_t \equiv w\left(e_{t-1}\right) \geq x_t + c\left(e_t\right),$$

where wealth w and cost of education c are such that

$$w\left(0\right) > 0, \ w' > 0, \ w'' \geq 0, \ c\left(0\right) = 0, \ c' > 0, \ c'' > 0.$$

In the optimum the budget constraint holds with equality. Using this to eliminate consumption from the objective function we can rewrite the optimization problem as

$$\max_{e_t} U^t = u\left(w_t - c\left(e_t\right)\right) + v\left(w\left(e_t\right)\right) - g\left(\left[\theta_{t+1}\left(e_t\right) - \theta_t^C\right]^2\right).$$

The state variable is e_{t-1}, the level of education of agent t, which also determines her position on the scale of values, θ_t, and her wealth, w_t. The derivative of the objective function with respect to e_t is

$$U_t' = -u'c'\left(e_t\right) + v'w'\left(e_t\right) - 2g'\theta_{t+1}'\left(e_t\right)\left[\theta_{t+1}\left(e_t\right) - \theta_t^C\right].$$

If the interior solution $\left(e_t > 0\right)$ for the optimization problem exists, it satisfies $U_t' = 0$:

$$
\begin{aligned}
v'w'\left(e_t\right) &= u'c'\left(e_t\right) + 2g'\theta_{t+1}'\left(e_t\right)\left[\theta_{t+1}\left(e_t\right) - \theta_t^C\right] \\
&= u'c'\left(e_t\right) + 2g'\lambda'\left(e_t\right)\left(\theta_t^H - \theta_t\right)\left[\lambda\left(e_t\right)\left(\theta_t^H - \theta_t\right) + \theta_t - \theta_t^C\right].
\end{aligned}
$$

This condition states that in the interior optimum marginal benefit from education (returns to education in terms of labour earnings) equals its marginal cost,

comprised of the physical cost of education and the disutility from the change in the offspring's values caused by education. When marginal cost exceeds marginal benefits for $e_t \geq 0$ the optimal choice of education is zero.

In a homogenous community, when all the agents in generation zero have identical values and preferences, $\theta_t^C = \theta_t$, the evolution of the values in the community is described by the following system of difference equations:

$$
\theta_{t+1}^C = [1 - \lambda(e_t)] \theta_t^C + \lambda(e_t) \theta_t^H,
$$

$$
e_t = \max\left\{0, e^* : v'w'(e^*) = u'c'(e^*) + 2g'\lambda'(e^*)\left(\theta_t^H - \theta_t^C\right)\left[\theta_{t+1}(e^*) - \theta_t^C\right]\right\}.
$$

If the interior solution for the second equation is unique and θ_t^H evolves independently of θ_t (or, indeed, θ_t^C), the path for θ_t (and for e_t) will be uniquely determined by two initial conditions, say, e_0 and θ_0.

For the process in θ_t^H we consider two scenarios. In the first scenario θ_t^H is exogenously fixed: the host society, or its core values promoted by its educational system are not influenced by the community nor do they change over time. In the second scenario θ_t^H is allowed to vary according to the following process:

$$
\frac{\theta_{t+1}^H - \theta_t^H}{\theta_t^H} = f\left(\frac{\theta_t^H - \theta_t^C}{\theta_t^H}\right),
$$

where f is a continuous and twice differentiable function, with $f(0) = 0$, $f'(0) < 0$, and $f''(0) > 0$. This intends to decribe a situation when the community is influential, perhaps, because of its large size, so that its values affect the values of the host society.

2.1 Steady state: separation, assimilation and melting pots.

We define the steady state in this economy as the one characterized by the constant level of education across the generations in the same family, and constant values of the community. In particular, a steady state with $e_t = 0$ for all $t \geq 0$ may exist if $\theta_t^H = const.$ (the host society is not willing to adjust to the community) and the optimal choice of education in every period is zero, because at time zero the marginal cost of education exceeds it marginal benefits,

$$\frac{v'w'(e^*)}{u'} < c'(e^*) + 2\frac{g'}{u'}\lambda'(e^*)\lambda(e^*)\left(\theta_0^H - \theta_0\right)^2.$$

This may occur when (i) education is prohibitively expensive, or (ii) the returns to education are low, or (iii) the weight parents put on their children's wellbeing is low, or (iv) the parents' dislike for the change in children's values is strong, or (v) when the effect of schooling on children's values at lower levels of education is strong, or (vi) when the values of the community and those of the host society differ widely. If this is the case, then all the subsequent choices of e_t are also optimally set to zero: the community falls in a low-skill or even a poverty trap, and the distance between the values of the community and the host society does not change. Note that all the conditions described above are indeed typically present in the case of the separated communities described by Constant et al (2009).

A steady state with $e_t = \hat{e} > 0$ may also exist; this, however, implies equalization of the values of the community and of the host society are the same:

$$\theta_t^H(\hat{e}) = \theta_t^C(\hat{e}) = \hat{\theta} = const.$$

The corresponding level of education solves

$$v'w'(\widehat{e}) = u'c'(\widehat{e}).$$ (2)

This equation may have more than one solution, and different solutions can have different local and global stability properties. Note that this equation does not contain f and λ, and therefore the level of $\widehat{e}$ is independent of the process of adjustment. However, the location of common values $\widehat{\theta}$ achieved in the steady state, depends on how fast the the community's and the host society's values change, and therefore does depend upon f and λ.

If there are multiple steady states they are characterized by different levels of education that can be attained by a given dynasty. These can be Pareto ranked. Define the welfare of a given dynasty in a steady state as the level of utility achieved by a member of this dynasty. In the steady state it equals

$$W(\widehat{e}) = u(w(\widehat{e}) - c(\widehat{e})) + v(w(\widehat{e})).$$

Differentiation with respect to $\widehat{e}$ gives

$$
\begin{aligned}
W'(\widehat{e}) &= u'(w(\widehat{e}) - c(\widehat{e}))[w'(\widehat{e}) - c'(\widehat{e})] + v'(w(\widehat{e}))w'(\widehat{e}) \\
&= u'(w(\widehat{e}) - c(\widehat{e}))w'(\widehat{e}) > 0.
\end{aligned}
$$

Thus, the steady state in which every dynasty has higher education attainment strictly Pareto dominates the one with the lower attainment. This will not necessarily be the case when there is heterogeneity in preferences or in the level of education of generation zero, although one could argue that the latter may have lesser role.

2.2 Dynamic path and intermediate scenarios.

In order to proceed with the analysis of the dynamic path of the economy we need to adopt specific functional forms. From now on we assume the following:

$$u(x) = \ln x, \qquad c(e) = r \cdot e + \frac{p}{2}e^2,$$

$$v(w) = \beta \ln w, \qquad \lambda(e) = a \cdot e - \frac{b}{2}e^2,$$

$$g(z^2) = \frac{q}{2}z^2, \qquad w(e) = w_0 \exp(\rho \cdot e),$$

$$f(z) = -c \cdot z + \frac{d}{2}z^2$$

where $a, b, p, q, r, \beta, \rho$ are non-negative constants.

Parameter q in the utility function measures the importance of community values for its adult members. In the analysis this is assumed to be constant across individuals, however in the simulations we allow this parameter to vary (in particular, by assuming that each family is characterized by its own value of q, drawn randomly from a uniform distribution). Parameter a in the weighting function λ captures the leverage of primary education on values (thus smaller magnitudes of a correspond to higher segregation), whilst parameter b represents how fast the effect of school norms on students' values weakens at higher levels of education, so that a higher magnitude of b reflects a poorer fit of students with the school norms. This implies that given a level of education, an individual will develop values closer to the community if the leverage of primary education on values is small and they are further from school norms (as per Akerlof and Kranton, 2002), whilst they will develop values closer to those of the host society values if the leverage of primary education on values is large (in line with Phinney et al, 2000, and the ICSEY project findings) and they fit better

with school norms (as in Goldin and Katz, 1997; and Alesina et al, 1999).

With these functional forms the evolution of the economy is described by the following system of equations,

$$\theta_{t+1} = \left(1 - a \cdot e_t + \frac{b}{2}e_t^2\right)\theta_t + \left(a \cdot e_t - \frac{b}{2}e_t^2\right)\theta_t^H,$$

$$\theta_{t+1}^H = \theta_t^H - c \cdot \left(\theta_t^H - \theta_t^C\right) + d \cdot \frac{\left(\theta_t^H - \theta_t^C\right)^2}{2\theta_t^H},$$

$$e_t = \max\{0, \widetilde{e}\}$$

where $\widetilde{e}$ solves

$$\beta\rho = \frac{r + p \cdot \widetilde{e}}{w_0 \exp\left(\rho \cdot e_{t-1}\right) - r \cdot \widetilde{e} - p \cdot \widetilde{e}^2/2} \\ + q\left[\left(a \cdot \widetilde{e} - \frac{b}{2}\widetilde{e}\right)\left(\theta_t^H - \theta_t^C\right) + \theta_t - \theta_t^C\right](a - b\widetilde{e})\left(\theta_t^H - \theta_t^C\right).$$

The solution describes the dynamics of the values of the community, given the initial conditions, say, $\left(\{e_0, \theta_0\}, \theta_0^H\right)$.

There is a possibility, observed in the simulation, that the realized dynamic path of the host society values is non-monotone: the host society may have a tendency to distant itself from the community at first, and gradually become more tolerant and start making steps towards integration, which it can do through schools that are willing to adjust to the diverse student body. The values can also diverge; the outcome depends on the initial values, as well as the parameters of the model. Note that the evolution of θ_t^H, rewritten as

$$\theta_{t+1}^H = \theta_t^H - c \cdot \left(\theta_t^H - \theta_t^C\right) + d \cdot \frac{\left(\theta_t^H - \theta_t^C\right)^2}{2\theta_t^H}, \ c > 0, \ d \geq 0,$$

or

$$\frac{\theta_{t+1}^H - \theta_t^H}{\theta_t^H} = -\frac{\theta_t^H - \theta_t^C}{\theta_t^H} \left[c - \frac{d}{2} \cdot \frac{\theta_t^H - \theta_t^C}{\theta_t^H} \right],$$

describes a partial adjustment at a diminishing rate or divergence at an increasing rate. Below we refer to the situation with $c = d = 0$ as the 'static case'.

One can see that in this economy the steady state with $e_t = e_0 = 0$ may exist in the static case, when the preferences are such that β is small (parents put low weight on their children's welfare) or q is large (the parents' discontent with the change in children's values is strong). It is also likely to happen when ρ is small (low returns to education), r and/or p are large (the physical cost of education is high), or a is large (the effect of elementary schooling on children's values is strong), or when $(\theta_0^H - \theta_0)$ is large (the initial gap between the values of the community and those of the host society is wide).

The situation with adjustment is fundamentally different from the static case. Given the same configuration of parameters, when the school, or, indeed, the host society, particularly through an inclusive schooling policy, is willing to adjust its values toward the community, it is possible that the gap between their values shrinks from $t = 0$ to $t = 1$. Thus, given $e_0 = 0, \theta_1^C = \theta_0^C$, is it easy to obtain the condition

$$\left(\theta_1^H - \theta_1^C \right)^2 < \left(\theta_0^H - \theta_0^C \right)^2 \text{ if } \frac{2-c}{d/2} < \frac{\theta_0^H - \theta_0^C}{\theta_0^H} < \frac{c}{d/2}.$$

With the sufficient reduction in the distance between the values, and therefore the sufficient reduction in the 'marginal discontent', it may become optimal for

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the new generation of parents to choose $e_1 > 0$. In the next period the gap will shrink even more as θ_1^C approaches θ_0^H due to $e_1 > 0$, which in turn induces higher e_2, and so forth. The process of convergence may, however, reverse, in particular, if the effectiveness of indoctrination at school weakens significantly at higher levels of education (b is sufficiently large relative to a). Thus, the outcome depends on both the schooling effect and the degree of influence of the community.

We now briefly analyze the existence of the steady state and the welfare implications of multiplicity of the steady states for this economy, assuming that the community members have identical preferences, so that $\theta_t^C = \theta_t$. Using the chosen functional forms we can rewrite (2) as

$$\frac{v'\left(w\left(\widehat{e}\right)\right)}{u'\left(w\left(\widehat{e}\right) - c\left(\widehat{e}\right)\right)} w'\left(\widehat{e}\right) = c'\left(\widehat{e}\right),$$

or

$$w_0 \exp\left(\rho\widehat{e}\right) = \frac{r}{\beta\rho} + \left(\frac{p}{\beta\rho} + r\right)\widehat{e} + \frac{p}{2}\widehat{e}^2, \tag{3}$$

where $\widehat{e}$ is the steady state level of education. Both sides of the equation are strictly increasing and convex in $\widehat{e}$. It is easy to see three different cases are possible:

(i) There is no solutions if $w_0 > \max\left\{\dfrac{r}{\beta\rho}, \dfrac{r}{\rho} + \dfrac{p}{\beta\rho^2}\right\}$;

(ii) There is a unique solution if $\dfrac{r}{p} > \dfrac{1}{(1-\beta)\rho}$ (this ensures $\dfrac{r}{\beta\rho} > \dfrac{r}{\rho} + \dfrac{p}{\beta\rho^2}$)
   and $\dfrac{r}{\rho} + \dfrac{p}{\beta\rho^2} < w_0 < \dfrac{r}{\beta\rho}$;

(iii) There are two solution if $\dfrac{r}{p} < \dfrac{1}{(1-\beta)\rho}$ and $\dfrac{r}{\beta\rho} < w_0 < \dfrac{r}{\rho} + \dfrac{p}{\beta\rho^2}$;

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(The knife-edge situations when $w_0 = r/(\beta\rho)$ or $w_0 = r/(\rho) + p/(\beta\rho^2)$ are of less interest.) In case (iii) the two steady states are characterized by different levels of education.

Local stability properties of a given steady state are determined by the magnitude of de_t/de_{t-1} at the point $e_t = e_{t-1} = \widehat{e}$. Straightforward calculations give

$$\left. \frac{de_t}{de_{t-1}} \right|_{e^*} = \frac{w'(\widehat{e})}{2c'(\widehat{e})} = \frac{\rho w_0 \exp(\rho\widehat{e})}{2(r + p\widehat{e})}$$
$$= \frac{1}{2\beta} + \frac{\rho\widehat{e}}{4} \left(1 + \frac{r}{r + p\widehat{e}} \right),$$

where the last equality follows from (3). The steady state is locally stable when this quantity is between zero and one; for this to be the case β has to be sufficiently large, and ρ sufficiently small; not much more can be said since the analytical form for the solution does not exist, although one can argue that if there are two steady states with $\widehat{e} > 0$ then the one with lower $\widehat{e}$ is likely to be locally stable, while if the steady state with $\widehat{e} > 0$ is unique then it is locally stable. (see Appendix for the details).

3 Simulation results

In this section we present the results of simulations of our model with heterogenous community (q drawn from a uniform distribution[2]) for different combinations of the magnitudes of the model parameters, which we use to discuss

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[2] We also ran simulations for a heterogenous community with different levels of education in the first generation, drawn from a uniform distribution. The results differ only in levels, while the shapes of the paths are essentially the same.

alternative outcomes with respect to integration, as well as how these can be influenced by policies. On the graphs below we plot the choice of education, the resulting shifts in the values of the community (blue lines) and the host society (red lines) over time, and the path of welfare. Our simulations for various configurations of parameter values appear to result robustly in a number of different scenarios, some of which are illustrated in the figures below, as the most interesting representative cases. In all simulations presented in this section we use $w_0 = 1$, $\rho = 0.25$, $p = 0.2$, $r = 0.1$, $\theta_0^H = 3$, $\theta_0^C = 1$, $e_0 = 0$, $\beta = 0.75$, $c = 0.1$. The first set of figures represents simulations for $E[q] = 0.1$, while in the second set $E[q] = 0.5$ so the average disutility from the future deviation of chidren's value from the parents' values is higher in the second case. It is obvious that when the community is more conservative, parent's choice of education for their child is substantially lower, compared to the first case, and so the values in the community do not change much over time. In addition, the first set of figures illustrates two different values of a parameter describing the community, while the second set does so for a parameter describing the host society.

In Figure 3 two cases are plotted for comparison. The solid curves correspond to $a = 1/3$ and $b = 9/5$, and the dashed curves correspond to $a = 1/3$ and $b = 2/3$; in both cases $c = 0.1$ and $d = 0.5$. The choice of education is higher in the second case, but the difference between the two cases is relatively small. The shifts in the values, however, are very different: in the first case, characterized by a higher b, or a poorer fit with school norms, the values of the community and the host society diverge, while in the second case the gap between values shrinks over

time. Thus, the first situation describes a community of well-educated minority (say, ethnic or religious) that is immune to the effects of the ouside culture and is not willing to integrate into the host society; this attitude makes the initial trend in the host values towards the community to reverse. As the community is alienated from the host society, the latter distances itself from the community even more. In the second case, when the effect of schooling diminishes slowly, the gradual shift of the community values towards the host society is met by the reciprocal shift in the host society values; the gap eventually shrinks: the two cultures "embrace each other". The welfare of the community is higher in the second case, primarily because of the smaller loss of utility due to the more gradual change in values.
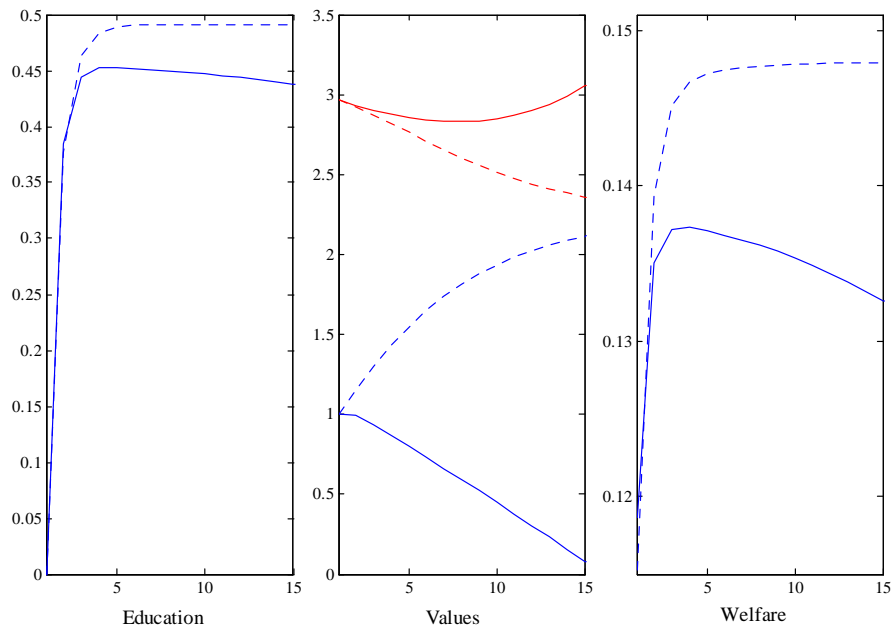
Figure 3 was obtained for $c = 0.1, d = 0.5$ (solid lines) and for $c = 0.1, d = 0.25$ (dashed lines). A higher value for the parameter d in the first case means that the host society is less willing to accommodate the community when the difference in values is large, compared to the first case with lower d. (In both cases we used $a = 4/3$ and $b = 2/3$, so that the effect of schooling does not diminish very much as the amount of education increases.)

One can see that in the first case the distance between the community and the host society increases over time, while education remains at a rather low level. Because now the disutility from changing values is relatively low, the community moves towards the host society, however, at the same time the society moves away. This describes, say, a low-skilled ethnic minority, trying to imitate and become integrated into the host culture, while the schooling system, or, indeed, the host society continues to emphasize the difference and maintains, or even increases, the distance from the community. In the second case the host society adjusts to the community, and both the educational outcomes and welfare are strikingly higher, – the latter not only due to the higher earnings, but also because with the adjusting host society its values, instilled in children through schooling, are now closer to the community values and so do not cause discontent to the parents. This describes the situation when the willingness of the host society to embrace the values of the minority is reinforced by the willingness of the minority to adjust.

Thus, through a simple representation of the relationship between values and education our model generates a variety of different scenarios of cultural

integration or segregation of minority groups characterised by different patterns of human capital accumulation and welfare. The outcomes for the community under these scenarios are summarized in a table below.
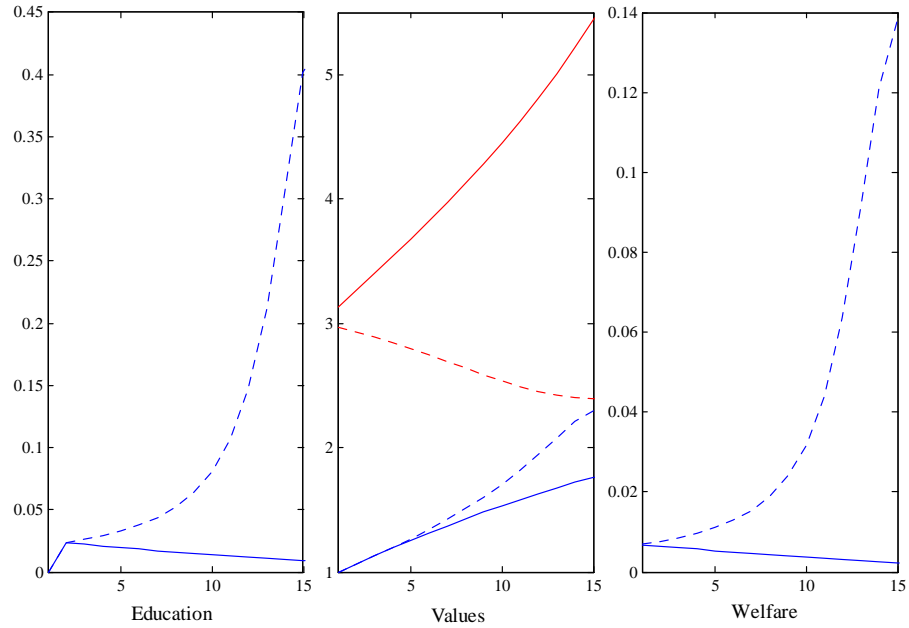
parameters	high d, low q	high d, high q	low d, high q
high b	high-skill, reclusive	high-skill, integrated	high-skill, reclusive
low b	high-skill, integrated	low-skill, rejected	high-skill, integrated

4   Discussion and conclusions

Our paper presents a model of values transmission across generations and communites and of the effect that different education and integration policies can

have on minorities' welfare, as well as on cultural integration. Using numerical simulations, we compared educational and socio-economic outcomes in different scenarios generated by the different relative importance attributed by parents to their tradional values and to their children's education, as well as by the different policy parameters, particularly regarding the school norms. In our simluations we chose a parameterisation that allows us to focus on social and educational policy options. For example, given parental incomes, values and preferences, a society comprised of segregated communities may need to put particular efforts in the short run into inclusive schools, in order to dampen the effect of exisiting segregation. We find that the initial heterogeneity in education and in preferences (the relative weight attributed to the preservation of values) in our framework does not matter for their corresponding dynamic paths: all families with different education level of generation 0 rapidly converge to the same path, as do those with different weights on the preservation of values. We also find that when the values of the community move towards those of the host society the welfare of the community is higher if the host society adjusts. In our framework there is a direct effect of higher levels education on welfare, through higher income, as well as an indirect effect, through moderation of the changes in community values, resulting in the mitigation of the parents' discontent and attenuation of an inter-generational conflict. On the other hand, our results support the view that alienation, or divergence of values, can occur if schools attempt to impose homogeneity and achieve complete conformity of the migrants with the external values. Thus, the dangers of indoctrination call for

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attention to school policies, particularly in relation to their attitude to cultural diversity.

Policies to reduce segregation within schools and communities appear to be effective in raising the educational attainment of immigrants' children in the long run (for a discussion of the role of insitutional and social capital in migrants' integration and well-being see Della Giusta and Kambhampati, 2006). The model simulations also allow to explore the effects of policy variables on the persistency of community values: these adjust and eventually converge to the external values only if the segregation is relatively low and students' fit with the school norms is relatively high; an empirical study by Balu et al. (2008) of the second-generation immigrant fertility in the United States shows that even in this case it takes considerable time before convergence in values takes place.

Whilst our model remains necessarily simple vis-a-vis the complex reality of minority communities, it allows to describe the key features of the evolution of individual identity and their effect on broader community outcomes, in terms of both education and welfare, as well as social inclusion. Our framework provides a tool for the analysis of the process of interaction between the individual identity and social values, and for the assessment of the relative effectiveness of different existing schooling and inclusion policies. We hope that our results will inform policy debates on the modes of social inclusion and academic discussions on identity and its importance for the socio-economic outcomes.

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A Local stability of the steady state

The steady state in the model economy is locally stable if

$$\left.\frac{de_t}{de_{t-1}}\right|_{e^*} = \frac{1}{2\beta} + \frac{\rho\widehat{e}}{4}\left(1 + \frac{r}{r+p\widehat{e}}\right) < 1,$$

where $\widehat{e}$ solves (3). This condition can be rewritten as

$$\beta p \rho^2 \widehat{e}^2 - 2\rho\left(2\beta p - p - r\beta\right)\widehat{e} + 2r\rho\left(1 - 2\beta\right) < 0. \tag{4}$$

The discriminant of the quadratic polynomial in $\widehat{e}$ in (4) is

$$D = 4\rho^2\left[\left(r^2\rho^2 + 4p^2\right)\beta^2 - 4\beta p^2 + p^2\right] > 0,$$

since the quadratic polynomial in β in square brackets has a negative discriminant, $-\left(2rp\rho\right)^2$. Therefore, the polynomial in (4) has two real-valued roots,

and the inequality in (4) holds for $\widehat{e} \in (e^-, e^+)$, where

$$e^\pm = \frac{\beta\left(2p - r\rho\right) - p \pm \sqrt{\left(r^2\rho^2 + 4p^2\right)\beta^2 - 4\beta p^2 + p^2}}{\beta p \rho}.$$

Two steady states are possible if both e^- and e^+ are positive (case 1), and only one steady state is possible if e^- is negative and e^+ is positive (case 2). If the configuration of parameters is such that for $e_0 = 0$ the optimal choice is $e_1 > 0$ (which is the situation we are interested in) then in case 1 the lower $\widehat{e}$ is between e^- and e^+, and the higher $\widehat{e}$ is above e^+, so the lower steady state is locally stable. Similarly, in case 2 the unique $\widehat{e}$ is below e^+, and so the unique steady state is locally stable.