A Theory of Tolerance

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Abstract

We propose a theory of tolerance where endogenous lifestyles and exogenous traits are invested with symbolic value by people. Value systems chosen by parents for their children affect the esteem enjoyed by individuals in society. Intolerant individuals attach all symbolic value to a small number of attributes and are irrespectful of people with different ones. Tolerant people have diversified values and respect social alterity. We study the formation of values attached to various types of attributes and identify circumstances under which tolerance spontaneously arises. Policy may affect the evolution of tolerance in distinctive ways, and there may be efficiency as well as equity reasons to promote tolerance.

Keywords: tolerance, value systems, cultural transmission.

JEL-Classification: Z1, D1.

1 Introduction

Tolerance - i.e. respect for diversity - is often viewed as a distinctive feature of modern western societies, one that clearly differentiates them from traditional ones. Whereas "traditional man" surrenders to social norms and heavily sanctions those who deviate, "modern man" accepts social alterity without raising his eyebrows. Tolerance may promote peaceful coexistence between diverse groups and favor individual self-actualization. Conversely, intolerance hinders the manifestation of proclivities and talents and demands a heavy toll on those who dare to be different. Minorities enjoy a substantial degree of protection only in tolerant societies, and that protection strengthens democratic political rights.

While tolerance might be desirable in principle, not all contemporary societies can be qualified as tolerant. Supporting this, empirical evidence comes from the World Values Surveys - waves of representative national surveys about attitudes, starting in the 1980s and covering many countries. Those surveys show that present pre-industrial societies exhibit distinctly low levels of tolerance e.g. for abortion, divorce, and homosexuality (Inglehart and Baker, 2000). Cross-country differences with respect to tolerance are typically explained by sociologists and political scientists resorting to so-called theories of cultural modernization. Accordingly, along with economic prosperity and with the deepening of market relations, deferential orientations, which subordinate the individual to the community, give way to "democratic personalities" and "liberal attitudes" that entail growing tolerance of human diversity (e.g. Nevitte, 1996; Inglehart, 1997). Economists are perhaps the only social scientists who have been silent about the nature of tolerance. However, economic reasoning may contribute original insights into the determinants and consequences of tolerance. In the current paper, we develop a framework based on utility-maximizing agents to think about tolerance.

In our model, every individual is equipped with a value system. The latter maps each element of a set of judgeable types into a scalar. The value system of an individual determines how much esteem he allocates to himself and others. In turn, self-esteem and the esteem received from others are arguments of an individual's utility function.

We study equilibria in which not only ressource allocation and relative prices but also symbolic values are endogenously determined. A comparison with price models may illuminate our approach. Economists have developed formal models to explain how prices form within various market structures. Similarly, value formation can be explained with reference to various socialization structures. While perfect market competition is the reference mechanism for studying prices, perfect socialization by altruistic parents can be considered the benchmark model for studying symbolic values. This means that parents choose the value system of their children so as to maximize their children's expected utility.[1]

We propose to think of tolerance as a property of the value system endorsed by people. A person is tolerant if she attaches symbolic value not only to her own characteristics but also to those that she does not have - but others have. Conversely, an intolerant person has an unbalanced value system that makes her at the same time complacent and irrespectful of traits and lifestyles that are not her own. A theory of tolerance must identify the circumstances under which parents have an incentive to educate their children to open minds, i.e. transmit a value system that attaches relatively equal worth to different traits and lifestyles.

The judgeable attributes that enter value systems and for which tolerance can be defined are as diverse as ethnic group, gender, profession and sexual orientation. The current paper is organized around three headings: endogenous attributes (e.g. occupation, dealt with in Sect. 3), exogenous stochastic attributes (e.g. homosexuality, dealt with in Sect. 4), and exogenous deterministic attributes (e.g. race and gender, dealt with in Sect. 5). While in some cases it may be debatable how to classify a particular attribute (e.g. religion), this way of proceeding enables us to present the relevant trade-offs in a very clear fashion.

Occupation is a central category for defining one's identity and a natural object of evaluation. Today, occupational diversity, with the exception of illegal activities, is accepted by virtually everyone; by contrast, intolerance with respect to various occupations was not rare in medieval european society. To put it in positive terms, craft honour and local patriotism were much stronger in those societies than today. The model presented in Section 3 offers an explanation for such a change.

In the case of endogenous attributes, a value system can be seen as an incentive mechanism designed by a benevolent parent. If the parent knows in which occupation the offspring will fare at best, the parent optimally tilts his child's value system in favor of that occupation. By teaching pride for that occupation and contempt for the remaining ones, the parent enhances the offspring's self-esteem at no private cost. Value systems will instead be balanced if socialization occurs behind a veil of ignorance. If parents are sufficiently uncertain about their offspring's talent or the future income opportunities

[1] Parents actually compete with other agencies like school, churches, and commercial advertisers, which all invest resources in order to affect the value systems of people. The key role of the family in shaping people's values has been documented in many empirical studies.

associated with the various occupations, value diversification is optimal, as it avoids the risk of very low self-esteem due to the wrong combination of values and behavior.

Pre-industrial societies displayed both rare occupational change (because of entry restrictions and slow technical progress) and low geographical mobility (because of exhorbitant mobility costs). This implied a relatively high degree of predictability of future activity and location. We suggest that craft honour and local patriotism began to vanish because technological and political innovations dramatically increased professional and geographical mobility.

Section 4 employs the notion of symbolic values to shed light on tolerance with respect to exogenous traits that parents cannot observe when they socialize their children, like homosexuality. Because of the insurance effect just described, the symbolic value associated with a given trait increases with the subjective probability held by the parents about their child developing that trait. As a consequence, beliefs dynamics can be a crucial ingredient for explaining the rise of tolerance.

To illustrate the role of beliefs dynamics, we develop a simple model where societies may be trapped in an intolerant equilibrium. In such a situation, individuals with the minority trait hide their true identity and by doing this confirm the belief that the trait is rare. This, in turn, leads families to instill intolerant values which justify the mimicking behavior of those with the minority trait. In such a situation, an anti-discrimination law that weakens the incentive to hide the trait may induce outing, updating of beliefs about trait frequency, and, eventually, a more tolerant value system.

Nowadays, the hottest issue concerning tolerance is, at least in Europe, the one about the ethnicity of immigrants. In terms of our approach, this is an example of a deterministic exogenous trait, similar in this to gender and race. Section 5 develops a simple model devoted to the emergence of tolerance for such traits.

The main thrust of that model is that educating to respect for alterity can be seen as an investment prior to matching. When individuals compete for matches, e.g. between national business owners and immigrated workers, being tolerant may yield a competitive advantage to its carrier since the latter can be expected to respect the partner's identity and is therefore a more attractive companion. Thus, the emergence of tolerant values requires both complementarity between the services provided by carriers of different traits and "personalized" teams, where members care about the treatment that they receive from the other team members. The resulting degree of tolerance depends on the intensity of competition for good matches.

2 Symbolic values and related literature

Our theory of symbolic values is based on four main assumptions. First, we posit that individuals pass judgments of approval, admiration, etc., and their opposite upon certain traits, acts, and outcomes. Those judgements obey an individual's value system, which is a way to allocate value to bundles of judgeable characteristics. Formally, we shall describe the value system of an individual as a function that maps the set of judgeable types onto the real line. We take the set of judgeable types as exogenously given.[2]

We think of the evaluation of types as an essentially relative procedure by which granting more value to a type implies that less value is attributed to the remaining ones. A special case is one where the individual ranks all types and the symbolic value that the individual associates with any particular type is that type's rank. Since the total number of ranks is given, assigning a higher value to a given type would imply that a lower value is associated to other types. However, we do not want to restrict value systems to be rank-dependent because people' s judgements seem to entail more than rank information: two types that rank one after the other may be close or far apart in terms of their symbolic values and that difference should be captured by two different value systems. Therefore, in order to capture both the relative dimension of values and value differences that do not stem from differences in rank, we normalize the total amount of value that an individual associates with all types to a constant; the allocation of that amount to the various types is then defined as the individual's value system.

Second, we assume that individuals desire a good opinion of oneself on the part of other people. The relevant human environment for approbativeness may be an individual's family, friends, colleagues, neighbors, or society at large. The desired ways of thinking may be in a scale that distinguishes contempt, indifference, interest, approval, praise, admiration, and veneration.

Third, individuals have a desire for self-esteem. This desire for a pleasing idea of oneself presupposes self-consciousness. Humans are both actors and spectators of what they are doing. Since they are evaluative beings, they also judge themselves.

Fourth, we posit that the standards of approbation or disapprobation which the individual applies to himself are the same as those which he applies to other people. This postulate corresponds to the rule of judging yourself as you would judge of others. While psychologists have identified ways of self-deception, i.e., methods that individuals adopt to manipulate their self-image, in the main individuals are subject to the control by the logic of consistency. It is difficult to systematically approve in oneself acts which one condemns

[2] A similar approach is adopted in the models of cultural evolution and identity discussed later. There, the existence of a culturally relevant trait and that of a social category are taken as given.

in others, and when one does so, his fellows are quick to point out the inconsistency.

In the current paper, value systems stem from socialization by altruistic parents.[3] This approach is closely related to models of cultural evolution proposed by Bisin and Verdier (2000, 2001), who have studied settings in which parents purposely socialize their children to selected cultural traits.[4] In their models, vertical socialization, along with intragenerational imitation, determines the long-term distribution of cultural traits in the population.

Our theory differs from Bisin and Verdier's mainly in two respects. First, Bisin and Verdier assume that parents want their children to have the same cultural trait as themselves. They motivate this assumption by the possibility of "imperfect empathy" on the side of parents. This means that parents evaluate their children's actions using their (the parents') preferences. In our theory, parents choose the value system of their children so as to maximize the child's utility. Second, the objects that are transmitted from parents to children are modeled in different ways. Whereas in Bisin and Verdier's theory parents transmit a preference trait, in ours they transmit a value system. The essential property of a value system is that, taking it in conjunction with an individual's attributes, it determines the esteem enjoyed by the individual. In our theory, individuals have preferences over esteem and the usual list of consumption goods. The advantage of modeling socialization to a value system rather than to a preference trait is that one keeps preferences fixed, so that normative analysis based on the Pareto criterion is possible. A cost of this modeling approach is that one has to add esteem to the standard arguments of the utility function. This is also true of Bisin and Verdier's theory, which introduces the offspring's preference parameter in the parent's utility function.

A related approach has been developed by Akerlof and Kranton (2000, 2005), whose notion of identity shares some important features with our notion of self-esteem. In their theory, a person's identity is associated with different social categories and how people in these categories should behave. Violating behavioral prescriptions causes a utility loss and may produce responses by others who want to defend their sense of self. We follow Akerlof and Kranton's theory in that we also generalize the utility function so as to include

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[3]An alternative route followed by the literature - e.g. Frank (1987) and Fershtman and Weiss (1998) - is the evolutionary approach, where the preference profile in society is determined by a process of economic selection. In that framework, the exogenously given preferences are replaced by an exogenous "fitness" criterion which determines the number of individuals with given preferences. Our approach is consistent with the view that caring about esteem may be wired into human beings as the outcome of evolutionary selection, whereas the symbolic values of attributes are the outcome of a socialization process. Such a dualistic view was proposed by Pugh (1978).

[4]See also Bisin *et al.* (2006). Empirical evidence on cultural transmission from parents to children has been presented e.g. by Fernandez *et al.* (2004), who argue that mothers affect their sons' preferences over women.

arguments that capture important nonpecuniary motivations of human action. However, we employ a different method to determine the prevailing norms of behavior. Akerlof and Kranton use sociological evidence to formulate assumptions about behavioral prescriptions that are likely to capture important aspects of reality. We derive those prescriptions as part of an equilibrium in a model based on individual optimization under constraints.[5]

An alternative route to behavioral prescriptions is proposed by Brekke *et al.* (2003) to explain voluntary contributions to public goods. In their model, individuals derive self-esteem from conforming to a contribution norm that is endogenously determined. The ideal contribution level is the one that maximizes social welfare when all individuals conform to it. Similarly to the warm-glow model, there is a moral motivation that alleviates the free-rider problem. A distinctive insight of Brekke *et al.* is that policies indirectly influence voluntary contributions through their effect on the individuals' perception of the morally ideal contribution. Kaplow and Shavell (2007) offer a general model of completely centralized norm formation, where feelings of guilt associated with some acts are inculcated by a central planner so as to maximize social welfare. They find that such moral sentiments can be welfare-improving in the presence of externalities but that they should only imperfectly correct behavior because they are costly to inculcate and subject to various constraints on their use.

Our approach is also related to Auriol and Renault's (2008) analysis of status allocation in firms. In their model, a principal designs a contract stipulating each agent's wage and status so as to solve a moral-hazard problem. Similarly to the model in the following section, Auriol and Renault study how a symbolic but scarce resource is allocated so as to create the desired incentives. There is a given amount of status that the principal attaches to the various positions within the firm and the agents care about the status associated with their own position. In terms of the approach of the current paper, their principal can be seen as selecting the value systems of her agents, where positions are the attributes invested with symbolic value and agents care about self-esteem and the esteem received from the other agents in the firm.

[5] Concerns for self-respect and esteem also play a key role in Benabou and Tirole's (2006) model of pro-social behavior. Their main interest is the interaction between those nonpecuniary motivations and asymmetric information. That interaction gives rise to both social signaling and self-signaling – when people are uncertain about the kind of people they are. Assuming that people value public spiritedness and disvalue greed, Benabou and Tirole generate several insights into individuals' contributions to public goods. By contrast with the current paper, they do not deal with the issue of why people attach value to certain attributes and not to others.

3 Economic activity

We first develop a deterministic model where tolerance does not arise. Then, we extend the model to incorporate uncertainty and identify circumstances under which tolerance arises.

3.1 Deterministic benchmark

Consider an economy populated by a continuum of atomistic individuals $i \in [0,1]$. Individuals consume one homogeneous good, which is used as the numeraire. They have common preferences and specialize in one of two activities or occupations, referred to as a and b. The income accruing to an individual specializing in activity $x \in \{a,b\}$ is denoted by y_x.[6] In order to capture decreasing returns and congestion effects, we assume that the income obtained from an activity is a decreasing function of the number of individuals who practice that activity. Denoting by n the number of individuals who practice activity a, the incomes $y_a(n)$ and $y_b(n)$ are respectively decreasing and increasing with n, and both functions are continuous.[7]

Occupations are invested with symbolic value by individuals. The value attached to occupation $x \in \{a,b\}$ by individual i is measured by a non-negative index $v(x,i)$. The couple $\{v(a,i), v(b,i)\}$ describes the value system of individual i. We use the normalization

$$v(a,i) + v(b,i) = 1, \tag{1}$$

so that the value of an activity relative to the alternative is between -1 and +1.

Individuals care about consumption and esteem, both of which depend on occupational choice. Preferences are additively separable and represented by

$$U(i) = S(c(i)) + \beta V(selfv(i)) + \gamma W(socv(i)). \tag{2}$$

The functions $S(\cdot)$, $V(\cdot)$ and $W(\cdot)$ are strictly increasing and continuous. The first one captures utility from consumption, which is given by the individual's income: $c(i) = y_{x(i)}$, where $x(i) \in \{a,b\}$ denotes the individual's occupation.

The second one captures utility from self-esteem. We define an individual's self-esteem as the esteem in which he holds his own occupation:

$$selfv(i) = v(x(i), i). \tag{3}$$

[6] Income should be thought of as including not only pay but all material consequences of an occupation that are relevant for utility.

[7] An example that satisfies our assumptions is the following. The consumption good is produced by competitive firms with two types of labor, a and b, and the production function is increasing and strictly concave in the two types of labor. With competitive labor markets, the equilibrium wages of the two occupations are continuous and decreasing functions of the number of individuals in each occupation.

The third term of the utility function captures utility from esteem received from others. In the model of the current Section we only consider the esteem received from society at large, i.e. an individual's social esteem. This is defined as the average of the esteem granted to an individual's occupation over the whole society:

$$socv(i) = \int_0^1 v(x(i), j)dj. \tag{4}$$

Parameters β and γ are positive and capture the strength of value concerns.

The timing of decisions is as follows. First, each individual i chooses his value system $\{v(a,i), v(b,i)\}$ subject to constraint (1). This step of the game can be interpreted as a benevolent parent choosing the values of his child. Second, individuals choose their activities $x(i)$ conditional on their values. Then, individuals receive their income and consume.

A *socio-economic equilibrium* is a situation in which each agent chooses his activity and values so as to maximize his utility function, taking the choices of other agents as given. A basic property of that equilibrium is the following one:

Proposition 1 *In equilibrium, each individual attaches the maximal amount of value to the activity that he practices:*

$$v(x(i), i) = 1, \qquad \forall i.$$

Hence, individuals are completely irrespectful of alterity: $v(x,i) = 0$ if $x \neq x(i)$. The proof of Proposition 1 relies entirely on the fact that individuals know their future occupations when they choose their values.[8] Given the absence of uncertainty about the returns to occupations a and b, individuals know their future occupation in equilibrium. Individuals cannot expect to be indifferent between the two occupations when they choose their values: if it were the case, they would strictly increase their utility by changing their values in a way that tips the balance towards one of the two occupations.

To prepare for the analysis of the stochastic version of the model, it is useful to stress some other properties of the equilibrium. By Proposition 1, the net benefit of occupation a relative to occupation b is

$$B_a(n) = [S(y_a(n)) - S(y_b(n))] + \gamma [W(n) - W(1-n)]. \tag{5}$$

The first term in square brackets on the right-hand side of this equation captures the material gain from choosing occupation a rather than b. This term is decreasing with

[8] All proofs in this paper are in the Appendix.

n because of the impact of the relative scarcity of the two types of labor upon their relative income. The second term in square brackets captures the symbolic gain from choosing occupation a rather than b. This term is increasing with n because the social esteem granted to an occupation increases with the number of individuals who value that occupation which is, in equilibrium, the number of individuals who choose that occupation.

An interior equilibrium, in which both occupations are chosen by a strictly positive mass of individuals, must satisfy the equilibrium condition $B_a = 0$. One can also have corner equilibria in which all individuals choose occupation a ($n = 1$ and $B_a \geq 0$) or b ($n = 0$ and $B_a \leq 0$). If B_a is strictly decreasing with n on the whole $[0, 1]$ interval, then the equilibrium must be unique.

The second term on the right-hand side in (5) increases with n from $-\gamma[W(1) - W(0)]$ for $n = 0$ to $\gamma[W(1) - W(0)]$ for $n = 1$. If γ is large enough this term dominates, implying that there are two stable equilibria, one in which all individuals practice a and one in which they all practice b. Conversely, if γ is small enough, the equilibrium is unique.

Therefore, concerns for social esteem can lead to conformism. By choosing to invest symbolic value in his own future activity an individual reduces the social esteem for the other activity and thus induces other individuals to imitate him. This may generate bandwagon effects in the choice of values and activities.

In an interior equilibrium, the concern for social esteem magnifies the difference between the size of group a and that of group b. Suppose that there exists $\widetilde{n} \in (0, 1)$ such that $y_a(\widetilde{n}) = y_b(\widetilde{n})$ and suppose $\widetilde{n} \neq 1/2$. The condition $B_a = 0$ can be satified at $n = \widetilde{n}$ if and only if $\gamma = 0$. Consider a stable interior equilibrium, satisfying $B_a'(n) < 0$ (this requires γ to be not too large). If $\widetilde{n} < 1/2$, then $B_a(\widetilde{n}) < 0$ and B_a is equal to zero for a value of n lower than $\widetilde{n}$. If $\widetilde{n} > 1/2$, then $B_a(\widetilde{n}) > 0$ and B_a is equal to zero for a value of n higher than $\widetilde{n}$. Hence, the concern for social esteem reduces the size of group a if it is smaller than 1/2 and increases it if it is larger. The reason is that individuals who belong to majority groups tend enjoy more social esteem in an intolerant society.

Notice that this conformism effect could not arise in a perfectly tolerant society. If all individuals attach the same value to each occupation, the symbolic rewards of both occupations are equal, independently from the size of their relative workforces, and only income matters for the individual's choice of activity.

3.2 Socialization behind the veil of ignorance

A natural interpretation of the above model is that an individual's values are selected by his benevolent parents and the latter have perfect foresight about the occupation of their child. We now relax the assumption of perfect foresight by allowing the income level to be stochastic. Specifically, individual i is assumed to earn $y_a(n)(1+\Delta_i)$ if employed in sector a, and to earn $y_b(n)(1-\Delta_i)$ if employed in sector b, where Δ_i is a binomial zero-mean random variable equal to $\Delta \in [0,1]$ with probability 1/2 and to $-\Delta$ with probability 1/2. Thus, Δ measures the degree of uncertainty and captures the parents' lack of knowledge about the relative payoffs of occupations faced by their children when adults. We refer to the realization of Δ_i as to the income opportunities or the talent of individual i. For ease of exposition, we assume completely independent risks. Thus, ex post there is one half of the population that is talented for a and the other half is talented for b; there is no aggregate risk.[9]

We additionally assume that $S(\cdot)$ and $V(\cdot)$ are strictly concave, and that a positive consumption level is necessary for subsistence, i.e. $\lim_{c\to 0} S(c) = -\infty$.

The sequence of events is as follows. First, the parent of individual $i \in [0,1]$ chooses his child's value system $\{v(a,i), v(b,i)\}$ subject to (1). The parent is perfectly benevolent and selects the values that maximize his child's expected utility. Second, Nature selects the income opportunities and each individual gets to know them. Third, individuals choose their occupations $x(i)$, receive their income, and consume.

3.2.1 Decision problem at family level

We solve for the parent's optimal investment in values by proceeding backwards, looking first at the child's choice of occupation, conditional on his values. Notice that when the child makes his choice, uncertainty has already been resolved so that the child has perfect foresight.

Utility derived from social esteem attached to each activity is exogenous at the individual level; thus, it will simply be denoted by W_a for activity a and by W_b for activity b. Similarly, we use y_a and y_b for the pecuniary return to activities. Individual i selects activity a if and only if

$$S(y_a(1+\Delta_i)) + \beta V(v_a) + \gamma W_a > S(y_b(1-\Delta_i)) + \beta V(1-v_a) + \gamma W_b,$$

where we use v_x for $v(x,i)$, $x \in \{a,b\}$, to save notation.

There are three cases to consider. The individual chooses activity a irrespective of his income opportunities, he chooses activity b irrespective of his income opportunities, or he chooses activity a if and only if $\Delta_i = \Delta$. These cases respectively arise under the

[9] As shown by Corneo and Jeanne (2007), the case of aggregate risk leads to qualitatively similar results.

following conditions:

$$\begin{aligned}
V(v_a) - V(1-v_a) &> \frac{1}{\beta}[S(y_b(1+\Delta)) - S(y_a(1-\Delta)) - \gamma(W_a - W_b)], \\
V(v_a) - V(1-v_a) &< \frac{1}{\beta}[S(y_b(1-\Delta)) - S(y_a(1+\Delta)) - \gamma(W_a - W_b)], \\
\frac{1}{\beta}[S(y_b(1-\Delta)) - S(y_a(1+\Delta)) - \gamma(W_a - W_b)] &< V(v_a) - V(1-v_a) \quad \wedge \\
V(v_a) - V(1-v_a) &< \frac{1}{\beta}[S(y_b(1+\Delta)) - S(y_a(1-\Delta)) - \gamma(W_a - W_b)].
\end{aligned}$$

Since $V(v_a) - V(1-v_a)$ is strictly increasing in v_a, these conditions define three sub-intervals for the value of activity a, say $[0, \underline{v}_a[$, $[\underline{v}_a, \overline{v}_a]$, and $]\overline{v}_a, 1]$, such that the individual chooses activity a (b) irrespective of his income opportunities if and only if the value he puts on activity a is in the third (first) interval, and he chooses the activity for which the income shock is positive if and only if v_a is in the intermediate interval. This is intuitive: the individual chooses the activity with the highest pecuniary payoff when his choice is not too much influenced, in one way or another, by symbolic values.

Note that, depending on preferences and returns to occupations, one could have $\underline{v}_a = 0$ or $\overline{v}_a = 1$, in which case the first or the third interval have zero measure. The intermediate interval collapses to one point $\underline{v}_a = \overline{v}_a$ if there is no uncertainty about the child's talent, i.e. $\Delta = 0$.

Let us turn to the parents' decision problem. Since there is no aggregate uncertainty, parents have perfect foresight about the aggregate variables. However, they are uncertain about their child's income opportunities. In the three sub-intervals defined above, the level of their child's expected utility is given as follows:

$$\begin{aligned}
\text{in } [0, \underline{v}_a[,\ E[U] &= \frac{S(y_b(1-\Delta)) + S(y_b(1+\Delta))}{2} + \beta V(1-v_a) + \gamma W_b, \\
\text{in } [\underline{v}_a, \overline{v}_a],\ E[U] &= \frac{1}{2}[S(y_a(1+\Delta)) + \beta V(v_a) + \gamma W_a] + \frac{1}{2}[S(y_b(1+\Delta)) + \beta V(1-v_a) + \gamma W_b], \\
\text{in }]\overline{v}_a, 1],\ E[U] &= \frac{S(y_a(1-\Delta)) + S(y_a(1+\Delta))}{2} + \beta V(v_a) + \gamma W_a.
\end{aligned}$$

Figure 1 shows how $E[U]$ depends on v_a in the case where the three intervals have a strictly positive measure. The child's welfare is strictly decreasing with v_a in the left-hand-side interval: increasing the value put by the child on activity a unambiguously reduces his welfare since he will practice activity b with certainty. The child's welfare strictly increases with v_a in the right-hand-side interval. The child's welfare is a concave function of v_a in the intermediate interval, since

$$\text{in } [\underline{v}_a, \overline{v}_a],\ \frac{dE[U]}{dv_a} = \frac{\beta}{2}[V'(v_a) - V'(1-v_a)],$$
$$\frac{d^2E[U]}{dv_a^2} = \frac{\beta}{2}[V''(v_a) + V''(1-v_a)] < 0.$$

From the expression above, it follows that if the interval $[\underline{v}_a, \overline{v}_a]$ contains 1/2, then in this interval the child's welfare is maximized by $v_a = 1/2$. If the interval $[\underline{v}_a, \overline{v}_a]$ does not contain 1/2, then $E[U]$ will reach its local maximum at a bound of the interval: 1/2 should be replaced by $\underline{v}_a$ if $\underline{v}_a > 1/2$ and by $\overline{v}_a$ if $\overline{v}_a < 1/2$.

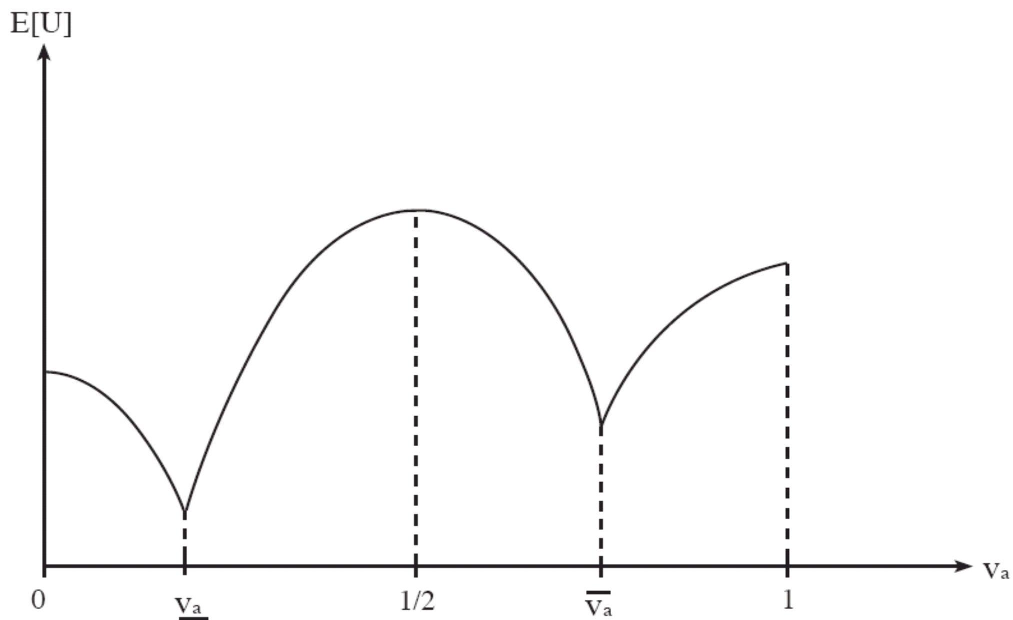

Figure 1: The parents' decision problem

Letting v_m denote the optimal value of activity a in the interval $[\underline{v}_a, \overline{v}_a]$, the corresponding maximum value of welfare is given by

$$E[U]_m^* = \frac{1}{2}[S(y_a(1+\Delta)) + S(y_b(1+\Delta))] + \frac{\beta}{2}[V(v_m) + V(1-v_m)] + \frac{\gamma}{2}[W_a + W_b].$$

In the left-hand-side and right-hand-side intervals, the child's expected utility is maximized by setting v_a to respectively 0 and 1, since in the left-hand-side interval expected utility strictly decreases with v_a and in the right-hand-side expected utility strictly increases with v_a. Hence, the maximum value of welfare attained in those two intervals is given by

$$\text{in } [0, \underline{v}_a[,\ E[U]_l^* = \frac{S(y_b(1-\Delta)) + S(y_b(1+\Delta))}{2} + \beta V(1) + \gamma W_b,$$
$$\text{in }]\overline{v}_a, 1],\ E[U]_r^* = \frac{S(y_a(1-\Delta)) + S(y_a(1+\Delta))}{2} + \beta V(1) + \gamma W_a.$$

The parent's optimal investment in values results from the comparison of $E[U]_l^*$, $E[U]_m^*$ and $E[U]_r^*$.

Proposition 2 *There exists a critical threshold in the uncertainty over the child's income opportunities,* $\overline{\Delta} > 0$*, such that:*

if $\Delta < \overline{\Delta}$*, the parent invests all the symbolic value in one activity which his child will practice irrespective of his income opportunities;*

if $\Delta > \overline{\Delta}$*, the parent invests the same symbolic value in each activity and the child chooses the one for which the income shock is positive.*

If the amount of uncertainty is negligible, parents optimally invest all symbolic value in one activity because doing so maximizes the child's self-esteem and costs little in terms of expected consumption. Authoritarian paternalism inculcates such values that the child is led to embrace the occupation that his parents actually chose for him. The result is a society of highly complacent and intolerant people.

If the veil of ignorance is thick enough, a paternalistic strategy will not be optimal. In order to preserve a high level of self-esteem, the child might perform an activity for which he is not talented. Beyond some point, uncertainty becomes so large that the income risk is not worthwhile bearing and the parents wish their child to perform the activity for which he turns out to be more talented. In this case, an agnostic view of the worth of occupations is transmitted. The result is a society of tolerant people who take advantage of their economic opportunities.

3.2.2 General equilibrium

At the general-equilibrium level, both the returns of the activities and their social esteem are endogenous. These variables determine the threshold level $\overline{\Delta}$ which is crucial for the choice of values by the parents.

Proposition 3 *An equilibrium in which all individuals are perfectly tolerant exists if and only if the uncertainty over the child's income opportunities is large enough. The threshold level of uncertainty is strictly increasing in* β*, the concern for self-esteem, and is unaffected by* γ*, the concern for social esteem.*

In the general equilibrium, there are three strategies that parents may follow: authoritarian education investing all value on a, authoritarian education investing all value on b, and permissive education with value diversification. The general equilibrium can be monomorphic, with all parents choosing the same strategy, or polymorphic, with different strategies yielding the same expected utility in equilibrium.

Besides the monomorphic equilibrium described in Proposition 3, tolerance may arise with respect to a subset of the entire population as a part of a polymorphic equilibrium. In such a case, tolerant individuals choose the activity with the highest income and enjoy a less than maximal level of self-esteem. The remaining individuals attain a maximal level of self-esteem, but face the risk of choosing the activity with the lowest income. While ex ante the expected utilities of tolerant and intolerant individuals are equal, ex post they differ. The conditions for existence of this type of equilibrium are derived in the Appendix. It remains true that the general equilibrium displays tolerant individuals if and only if the uncertainty parameter Δ is large enough.

3.3 Remarks on efficiency

While the socialization strategies selected by parents are privately optimal, they need not be socially optimal: a socialization failure may occur. For instance, it could be that the socio-economic equilibrium only has intolerant individuals while tolerance is socially desirable. We now sketch the possibility of efficiency reasons for collective action in support of tolerant values.

In order to illustrate how efficiency concerns may justify policies for tolerance, consider the deterministic model. If all individuals are intolerant, the two activities will carry a different social esteem as soon as $n \neq 1/2$. In contrast, if all individuals are perfectly tolerant (i.e., attach the same value to each activity), the two activities will carry the same esteem. Hence, a distinctive consequence of intolerance is to induce a wedge, in equilibrium, between the real return of the two activities. The move from an intolerant to a tolerant society would therefore increase aggregate income. Intuitively, in a tolerant society there is no social pressure to choose any particular activity and people choose the one with the largest material return. Thereby, production efficiency is enhanced.

As noted above, there is a utility loss inherent in the shift to tolerance, that comes from the reduction in self-esteem. However, if $\beta[V(1) - V(1/2)]$ is sufficiently small, this loss is more than offset by the income gain. The Appendix offers an example where a shift from laissez-faire to a tolerant society generates a Pareto-improvement.

4 Sexual orientation

In contemporary societies, intolerance mainly concerns groups that differ by some characteristic that they are not really responsible for, like sexual orientation, colour of skin, and ethnic group. Differently from occupation, those traits cannot freely be chosen by individuals. The same could be argued with respect to traits like alcoholism and drugs use, the occurrence of which might have genetic causes.

This Section illustrates how beliefs affect the amount of tolerance and discusses equity reasons for public policy in support of tolerance in that case. Symbolic value is attached to a trait $x \in \{a, b\}$ that is exogenously acquired with a given probability. As an example, individuals with trait a could be the heterosexual ones and those with trait b the homosexual ones. Parents inculcate values about x in their children before knowing which trait they will have.

4.1 Symmetric information

There is a continuum of individuals $i \in [0, 1]$ who derive utility from consumption and esteem. Preferences and value systems satisfy equations (1), (2), (3) and (4). We assume that $V'' < 0$. The trait is exogenous and, for simplicity, economically neutral, i.e. $y_a(n) = y_b(n) = y$ for all n. Denote by $q \in (0, 1/2)$ the probability for a child to develop trait b, the minority trait.

Benevolent parents choose their child's value system before knowing the child's trait. The realization of the trait in conjunction with the value systems determine the esteem of individuals. In equilibrium, every parent maximizes his child's expected utility taking other parents' decisions as given.

Proposition 4 *In an interior equilibrium, all individuals select the value system $\{v_a, v_b\}$ uniquely determined by*

$$(1 - q)V'(v_a) = qV'(v_b)$$

and (1). The value attached to b is strictly increasing with q.

If q is close to 0, people will attach a very low value to b; for instance, if $V(\cdot)$ is logarithmic, $v_b = q$. Then, those who end up with trait b will suffer from both a very low level of self-esteem and a very low level of social esteem.

This laissez-faire outcome may be publicly viewed as unjust because the individuals are not responsible for their trait. Conversely, tolerance would equalize the level of esteem over individuals and this outcome may be seen as equitable. Specifically, tolerance would be implemented by a Rawlsian social planner whose task is to select a common value system so as to maximin the ex-post level of utility in society.

Notice, however, that tolerance would not be warranted on equity reasons if one adopts a utilitarian welfare function. In that case, the first-order condition for the maximization of social welfare is

$$(1-q)\left[V'(v_a)+\frac{\gamma}{\beta}W'(v_a)\right]=q\left[V'(1-v_a)+\frac{\gamma}{\beta}W'(1-v_a)\right].$$

Since $q<1/2$, this condition cannot be satisfied by $v_a=1/2$. This condition is also different from the equilibrium first-order condition under laissez-faire because of the terms in W'. However, it is a priori unclear whether the values preferred by the utilitarian planner are more or less tolerant than those arising under laissez-faire. If W' is constant, the planner prefers less tolerant values.

4.2 Asymmetric information and learning

The veil of ignorance behind which socialization takes place may sometimes be altered by public policy. We now illustrate how anti-discrimination laws may induce private information to be released and thereby increase the degree of tolerance.

Modify the model above so as to introduce asymmetric information and learning along the following lines. First, assume that generations $t=1,2,..T$ sequentially choose their values. Second, assume that there are two possible states of the world: $\overline{s}$ and $\underline{s}$. Those states are associated with different frequencies of the trait b in the population: for every generation, $\Pr\{x(i)=b|\underline{s}\}=\underline{q}$ and $\Pr\{x(i)=b|\overline{s}\}=\overline{q}$, with $\underline{q}<\overline{q}<1/2$. Third, assume that the trait b is private information and its carriers can mimick those with trait a at a utility cost ψ. This cost may be interpreted as the psychologic cost of repressing identity, net of any costs due to discrimination. Without significant loss of generality, assume that $V(\cdot)$ is logarithmic.

All individuals ex ante choose their values and type-b individuals ex-post simultaneously choose whether to mimick type-a individuals. Each generation observes the frequency of revealed trait b in the previous generation before choosing their values and uses that observation to update its beliefs about the state of the world. To focus on essentials, suppose that each generation has the prior $\Pr\{s=\underline{s}\}=1$.

We analyze the model starting with the socialization and mimicking decisions of the initial generation. As in the static model, the optimal socialization strategy for individuals at $t=1$ is to set $v_b=\underline{q}$. Individuals who turn out to have trait b choose to hide their trait, given that everybody else does the same, if

$$W((1-\underline{q})^2+\underline{q}^2)-W(\underline{q})\geq\frac{\psi}{\gamma}, \tag{6}$$

where the left-hand side is proportional to the utility gain derived from improved social esteem and the social esteem of an imitator is his expected value, $\underline{q}v_b+(1-\underline{q})v_a$.

Suppose that (6) is satisfied, so that there exists a pooling equilibrium, i.e. outing does not occur. Then, an equilibrium where b-type individuals reveal themselves cannot exist. In a separating equilibrium, the condition $W(1-\underline{q}) - W(\underline{q}) < \psi/\gamma$ must hold, since deviating would entail receiving a social esteem equal to v_a. Since $\underline{q} < 1/2$, that condition cannot hold if (6) is satisfied.

If nobody in the initial generation reveals trait b, the second generation does not learn anything about the true state of the world. Hence, it replicates the decisions of the initial generation. By iteration, this remains true of all generations.

This equilibrium path may be interpreted as depicting an intolerant society where alterity does not manifest itself. In each period, individuals with the minority trait hide their true identity and by doing so they confirm the prior that the trait is rare. This, in turn, leads families to instill intolerant values which prompts those with the minority trait to hide it.

Now, suppose that at some time t a shock shifts the utility cost of mimicking from ψ to $\psi' > \psi$, for instance as a consequence of passing an anti-discrimination law. Suppose that

$$W(1-\underline{q}) - W(\underline{q}) < \frac{\psi'}{\gamma}. \tag{7}$$

Then, the previous mimicking equilibrium breaks down and the new one has type-b individuals outing themselves.

In this case, generation $t+1$ learns the true state of the world. If the true state of the world is not $\underline{s}$, as believed by all previous generations, but $\overline{s}$, the individuals realize that the probability to get endowed with trait b is $\overline{q} > \underline{q}$. As a consequence, they invest trait b with value $\overline{q}$. At $t+1$, individuals with trait b reveal themselvs if

$$W(1-\overline{q}) - W(\overline{q}) \leq \frac{\psi'}{\gamma}.$$

By (7) and $\overline{q} > \underline{q}$, this condition is indeed satisfied and no pooling equilibrium exists. Hence, the value attached to trait b increases to $\overline{q}$ for ever. By setting an incentive to reveal their minority trait, an anti-discrimination law can trigger a decentralized move towards a more tolerant society.

5 Gender and race

Hitherto we have argued that individuals may attach value to characteristics that they do not possess because their socialization took place behind a veil of ignorance. However, there are characteristics like gender, nationality, and ethnic group that are known by parents when they socialize their children. While the above model would predict intolerance in that case, one observes people who do pay respect also to the gender, nationalities, and ethnic groups that are not their own.

Tolerance with respect to those traits can be explained even within a model of perfect vertical socialization. Parents may instill tolerance because it indirectly increases their child's expected consumption when the latter is determined through matching with other people. Matching includes marriage (in which case value is invested on gender), employment when the race of the employer and that of the employee differ (value put on race), international trade ventures (value put on nationality). In those situations, an individual's payoff from a match increases with the amount of esteem received by the individual's partner, i.e., the value that the partner attaches to the individual's trait. If people compete for matches, being tolerant increases one's attractiveness as a partner, because a tolerant partner is respectful. Thus, educating to tolerance can improve the child's chances to make a good match at adult age.

As an application, consider the social integration of immigrant workers from a different ethnic group. Assume that production occurs in teams where workers personally interact, i.e. they receive esteem from their co-workers. To begin with, assume that national and foreign workers are perfect substitutes. Then, there is an equilibrium with segregation where all teams are ethnically homogeneous and people are ethnically intolerant. No integration occurs because teaching tolerant values decreases the esteem that a worker confers to the other members of a team and thus makes that worker less valuable to such a team. In this case, tolerance cannot arise unless it is costly for firms to set up teams according to ethnicity. Notice that public policy can alter those costs, e.g. by forbidding firms to hire and fire according to ethnic group.

Assume now that national and foreign workers are complementary; for instance, nationals own restaurants and foreigners can cook pizzas; teams must be formed by one national and one foreigner. In this case, equilibrium value systems depend on the intensity of competition on the two sides of the market. Suppose that the pizza bakers are vertically differentiated according to their skill. Then, a pizzeria owner who wants to hire a high-quality baker has two instruments at his disposal: posting a high wage and attaching a positive value to the immigrants' ethnicity. If nationals' assets have different productivities, they may eventually offer vertically differentiated jobs, i.e. packages of material and symbolic rewards, to the immigrant workers. In order to get a better job, immigrants may then have an incentive to attach a positive value to the nationals' ethnicity: for given skill, pizzeria owners prefer a more deferential baker. In such a case, both ethnic groups may end up respecting each other.

5.1 Matching model

We illustrate the above mechanism by means of a simple model of a marriage market, where gender is the characteristic on which symbolic value is put. There are two types of individuals, men, denoted by M, and women, denoted by F, that are to be bilaterally matched. Each group consists of a continuum, whose mass is normalized to one. Each individual is characterized by an initial endowment of a gender-specific good. We denote by ω_M and ω_F the endowment of, respectively, men and women. For simplicity, the endowment is assumed to be distributed according to the same density function for both sexes. Density is strictly positive on some interval $[0, \overline{\omega}]$, where $\overline{\omega} > 0$. After that couples are formed, every man consumes his wife's endowment and every woman consumes her husband's endowment.

Symbolic value is associated with types. The value that individual i assigns to type $\theta \in \{M, F\}$ is measured by a non-negative index $v(\theta, i)$ and total symbolic value is normalized to unity:

$$v(M, i) + v(F, i) = 1. \tag{8}$$

Utility is an increasing function of own consumption, self-esteem and esteem granted by one's partner.[10] Self-esteem is the esteem in which the individual holds his own type, while the esteem that the individual receives from the partner is the value put by the latter on the individual's type. We specialize the utility function to

$$U = \sigma\omega_p + \ln(v) + (1 + \omega_p)v_p, \tag{9}$$

where ω_p is the endowment of the individual's partner, v is the value that the individual puts on own type, v_p is the value that the partner puts on the individual's type, and σ is a positive preference parameter. Thus, the second term of the utility function comes from self-esteem, while the first and the third term come from matching. If an individual is not matched, then $\omega_p = v_p = 0$.

The timing of decisions is as follows. First, individuals simultaneously choose their value systems $\{v(M, i), v(F, i)\}$ subject to constraint (8). This step of the game can be interpreted as benevolent parents choosing the values of their children. For simplicity, there is no uncertainty, i.e. parents know their children's endowment when they socialize them. Second, individuals voluntarily match. In equilibrium, values are optimally chosen, the matching outcome is stable and correctly anticipated when the values are chosen.

We establish the following fact:

[10] Social esteem could be added without any change in results.

Proposition 5 *There is an equilibrium at which the value that an individual invests in the other type is* $\frac{\omega}{1+\omega}$*, where* ω *is the individual's endowment.*

In this equilibrium, the degree of tolerance depends on the individual's endowment. The larger the endowment, the larger is the value that an individual puts on alterity. This result is driven by the fact that the marginal utility generated by the esteem received from the partner increases with the consumption level, see (9). This makes competition for matches more intense at higher levels of endowment and leads the corresponding individuals to invest more value on alterity.

Equilibrium is not unique if $\sigma = 0$. In that case, complete intolerance also is an equilibrium. If nobody of the opposite sex is expected to be respectful, there is no competition for partners as lack of respect kills their matching value. Then, individuals of the other sex put no value on alterity, which prompts the opposite sex to do the same. This equilibrium is Pareto-dominated by the one with tolerant individuals.

6 Conclusion

Tolerant attitudes towards diversity can be socially desirable on various grounds. However, they are not necessarily the outcome of a spontaneous process. At the decentralized level of families - society's cells - there exist powerful incentives based on self-interest to shape children's attitudes. Moving from an intolerant to a tolerant attitude means that the individual passes a more positive judgment on the attributes that he does not possess relative to the ones he has. For tolerance spontaneouosly to arise, the ensuing psychic cost must be outweighed by the private benefits conferred by tolerance. A first benefit is that, to the extent that values are transmitted by parents behind a veil of ignorance, tolerance produces an insurance effect with regard to the individual's self-esteem. A second benefit is that having an open mind is an investment prior to matching with persons who possess the attributes that the individual does not have. The family's economic and institutional environment, influenced by public policy, may heavily affect those incentives, favoring or hindering the emergence of tolerant personalities.

The analysis in this paper has been carried out in very stylized models that aim at exhibiting fundamental trade-offs in a crystal-clear fashion. There are several possibilities to develop more detailed models of tolerance, yielding policy implications for distinctive issues like assimilation and crime. Whereas the current paper has employed a benchmark model in which benevolent parents select their children's values, future research could scrutinize richer settings of cultural transmission, e.g. including horizontal transmission by peers, medias and other agencies of socialization. Incorporating insights from psychology and neuroscience, as practiced by behavioral economics, would also be a worthwhile strategy to extend the approach proposed in this paper.

APPENDIX

Proof of Proposition 1: It is optimal for an agent who knows which activity he will perform to invest all symbolic value on this activity, since this increases his self-esteem without affecting the other determinants of his utility. **QED**

Proof of Proposition 2: We first show that there exists a unique $\overline{\Delta} > 0$ such that the parent is indifferent between concentration and diversification of value, i.e.,

$$U^*_{sp} = E[U]^*_m, \tag{10}$$

where $U^*_{sp} \equiv Sup\,\{E[U]^*_l, E[U]^*_r\}$.

It is easy to see that $E[U]^*_m$ is strictly increasing with Δ, since

$$\frac{\partial E[U]^*_m}{\partial \Delta} = \frac{1}{2}\left[y_a S'(y_a(1+\Delta)) + y_b S'(y_b(1+\Delta))\right] > 0.$$

By contrast, U^*_{sp} is strictly decreasing with Δ because both $E[U]^*_l$ and $E[U]^*_r$ are. For $E[U]^*_l$ this results from,

$$\frac{\partial E[U]^*_l}{\partial \Delta} = \frac{y_b}{2}\left[S'(y_b(1+\Delta)) - S'(y_b(1-\Delta))\right] < 0,$$

where the inequality follows from the concavity of $S(\cdot)$. A similar argument holds for $E[U]^*_r$.

Hence $E[U]^*_m - U^*_{sp}$ is strictly increasing with Δ, negative for $\Delta = 0$ and converges to plus infinity if $\Delta = 1$ because $S(0) = -\infty$. Since U^*_{sp} and $E[U]^*_m$ are continuous in Δ, there exists a unique $\overline{\Delta}$ between 0 and 1 such that $E[U]^*_m = U^*_{sp}$.

It remains to be shown that whenever diversification is optimal, then both activities are invested with the same symbolic value. This can be proven by contradiction. Suppose that the optimal value choice belongs to the interval $[\underline{v}_a, \overline{v}_a]$ but is not 1/2. Since it is given by v_m, the optimal value must therefore be either the lower or the upper bound of that interval. First, suppose $v_m = \underline{v}_a$. Since $E[U]$ is strictly decreasing in the interval $[0, \underline{v}_a[$, there exists a v_a in this interval that yields a higher expected utility than $\underline{v}_a$. Hence, $\underline{v}_a$ cannot be optimal. Second, suppose $v_m = \overline{v}_a$. Since $E[U]$ is strictly increasing in $]\overline{v}_a, 1]$, there exists v_a in this interval that yields a higher expected utility than $\overline{v}_a$. Hence, $\overline{v}_a$ cannot be optimal either. This shows that if v_m is optimal, then $v_m = 1/2$. **QED**

Proof of Proposition 3: By Proposition 2, in an equilibrium without intolerant individuals, $v(a,i) = 1/2$, $\forall i$ and $n = 1/2$ since one half of the population is talented for one or the other occupation ex post. As a consequence, $y_a = y_a(1/2)$, $y_b = y_b(1/2)$,

$W_a = W_b = W(1/2)$. By Proposition 2, tolerance is the optimal strategy for parents if and only if $\Delta > \overline{\Delta}$, where $\overline{\Delta}$ is implicitly defined by (10).

Hence, a general equilibrium without intolerant individuals exists if and only if Δ is larger than the threshold level implicitly defined by (10) where the functions U^*_{sp} and $E[U]^*_m$ are evaluated at $y_a = y_a(1/2)$, $y_b = y_b(1/2)$, $W_a = W_b = W(1/2)$.

Let $\overline{\Delta}^*$ denote the general equilibrium threshold level. Proof of existence and uniqueness of this threshold level is equivalent to that given for Proposition 2. Straightforward computations reveal that the threshold level of uncertainty $\overline{\Delta}^*$ is implicitly defined by:

$$S\left(y_a\left(\frac{1}{2}\right)(1+\overline{\Delta}^*)\right) + S\left(y_b\left(\frac{1}{2}\right)(1+\overline{\Delta}^*)\right)$$

$$-Sup\left\{\begin{array}{c} S\left(y_a\left(\frac{1}{2}\right)(1-\overline{\Delta}^*)\right) + S\left(y_a\left(\frac{1}{2}\right)(1+\overline{\Delta}^*)\right), \\ S\left(y_b\left(\frac{1}{2}\right)(1-\overline{\Delta}^*)\right) + S\left(y_b\left(\frac{1}{2}\right)(1+\overline{\Delta}^*)\right) \end{array}\right\}$$

$$= 2\beta\left[V(1) - V\left(\frac{1}{2}\right)\right].$$

Totally differentiating this expression reveals that the threshold level is strictly increasing in β, the concern for self-esteem, and is unaffected by γ, the concern for social esteem. **QED**

Polymorphic equilibrium: At most three types of socialization strategies may exist in equilibrium: investing all symbolic value in a, investing all symbolic value in b, or putting the same value in each activity. Define, respectively, by ρ, λ and μ the mass of families following each socialization strategy in equilibrium, with $\rho + \lambda + \mu = 1$.

By the law of large numbers, one half of the number of children of permissive parents will perform activity a, while the other half will choose activity b. Thus, $n = \rho + \mu/2$ and $1 - n = \lambda + \mu/2$. Using these relationships and the derivations in Section 4, the expected utilities associated with each socialization strategy can be written as,

$$R(\rho,\mu) \equiv E[U]^*_r = \frac{1}{2}\left[S\left(y_a\left(\rho+\frac{\mu}{2}\right)(1+\Delta)\right) + S\left(y_a\left(\rho+\frac{\mu}{2}\right)(1-\Delta)\right)\right] + \beta V(1) + \gamma W\left(\rho+\frac{\mu}{2}\right),$$

$$\begin{aligned} L(\lambda,\mu) \equiv\ & E[U]^*_l = \frac{1}{2}\left[S\left(y_b\left(1-\lambda-\frac{\mu}{2}\right)(1+\Delta)\right) + S\left(y_b\left(1-\lambda-\frac{\mu}{2}\right)(1-\Delta)\right)\right] \\ & +\beta V(1) + \gamma W\left(\lambda+\frac{\mu}{2}\right), \end{aligned}$$

$$\begin{aligned} M(\rho,\lambda,\mu) \equiv\ & E[U]^*_m = \frac{1}{2}\left[S\left(y_a\left(\rho+\frac{\mu}{2}\right)(1+\Delta)\right) + S\left(y_b\left(1-\lambda-\frac{\mu}{2}\right)(1+\Delta)\right)\right] \\ & +\beta V(1/2) + \frac{\gamma}{2}\left[W\left(\rho+\frac{\mu}{2}\right) + W\left(\lambda+\frac{\mu}{2}\right)\right]. \end{aligned}$$

An equilibrium vector $(\rho^*, \lambda^*, \mu^*)$ is an element of Simplex $\{3\}$ such that if $\rho^* > 0$, then $R(\rho^*, \mu^*) \geq Sup\{L(\lambda^*, \mu^*), M(\rho^*, \lambda^*, \mu^*)\}$ and satisfying analogous conditions for the cases $\lambda^* > 0$ and $\mu^* > 0$.

In principle, seven types of equilibria may exist: three monomorphic equilibria in which only one socialization strategy is employed, three polymorphic equilibria in which only one socialization strategy fails to be employed, and one polymorphic equilibrium in which all three socialization strategies are employed by a strictly positive mass of families.

However, an equilibrium with three groups cannot exist. If it existed, all three socialization strategies would deliver the same level of expected utility. Meeting the equilibrium conditions $E[U]_r^* = E[U]_l^*$ is equivalent to

$$\begin{aligned} & \frac{1}{2}\left[S\left(y_a\left(n\right)\left(1+\Delta\right)\right) + S\left(y_a\left(n\right)\left(1-\Delta\right)\right)\right] + \gamma W\left(n\right) \\ = & \frac{1}{2}\left[S\left(y_b\left(n\right)\left(1+\Delta\right)\right) + S\left(y_b\left(n\right)\left(1-\Delta\right)\right)\right] + \gamma W\left(1-n\right), \end{aligned}$$

while $E[U]_r^* = E[U]_m^*$ implies

$$\begin{aligned} & \frac{1}{2}\left[S\left(y_b\left(n\right)\left(1+\Delta\right)\right) - S\left(y_a\left(n\right)\left(1-\Delta\right)\right)\right] - \frac{\gamma}{2}\left[W\left(n\right) - W\left(1-n\right)\right] \\ = & \beta[V(1) - V(1/2)]. \end{aligned}$$

Since this two-equations-system only has one unknown, it is overdetermined and generically has no solution. Hence, an equilibrium with three groups does not exist in general.

Consider now the possibility of an equilibrium where $\rho^* > 0$, $\lambda^* > 0$, and $\mu^* = 0$. Then, $n = \rho^*$ is determined by $E[U]_r^* = E[U]_l^*$ or,

$$\begin{aligned} & \frac{1}{2}\left[S\left(y_a\left(\rho^*\right)\left(1+\Delta\right)\right) + S\left(y_a\left(\rho^*\right)\left(1-\Delta\right)\right)\right] + \gamma W(\rho^*) \\ = & \frac{1}{2}\left[S\left(y_b\left(\rho^*\right)\left(1+\Delta\right)\right) + S\left(y_b\left(\rho^*\right)\left(1-\Delta\right)\right)\right] + \gamma W\left(1-\rho^*\right). \end{aligned}$$

This equation is similar to the condition $B_a = 0$ in the deterministic model. This is not surprising, since the equilibrium configuration that we are now considering is one in which each family puts all symbolic value in one occupation. This is precisely what occurred in the model studied in Sect. 3. Therefore, the same results apply here. In particular, the case of a corner solution in the model of that Section corresponds here to the case of non-existence of the equilibrium with both $\rho^* > 0$ and $\lambda^* > 0$. In that case, all the individuals practice the same occupation in equilibrium.

Consider now the more interesting case where $\rho^* > 0$, $\mu^* > 0$, and $\lambda^* = 0$. Such a configuration could not arise in the model without uncertainty. In an equilibrium with both tolerant people and intolerant people practicing activity a, $E[U]_r^* = E[U]_m^*$ must hold and the equilibrium has to satisfy,

$$\frac{1}{2}\left[S\left(y_b\left(n\right)\left(1+\Delta\right)\right)-S\left(y_a\left(n\right)\left(1-\Delta\right)\right)\right]-\frac{\gamma}{2}\left[W\left(n\right)-W\left(1-n\right)\right]=\beta[V(1)-V(1/2)].$$

Using $n = \rho+\mu/2$ and $\rho+\mu = 1$, we can express the equilibrium partition as a function of n. The portion of intolerant individuals is given by $\rho^* = 2n-1$ and the fraction of tolerant individuals is $\mu^* = 2(1-n)$.Notice that one necessarily has $n > 1/2$. Hence, in such an equilibrium, a permissive education leads to both lower self-estem and lower expected social esteem than an authoritarian one; but this is offset by a larger expected income.

The net benefit of value specialization relative to value diversification is given by

$$\widetilde{B}_a(n)=\frac{1}{2}\left[S\left(y_a\left(n\right)\left(1-\Delta\right)\right)-S\left(y_b\left(n\right)\left(1+\Delta\right)\right)\right]+\beta[V(1)-V(1/2)]+\frac{\gamma}{2}\left[W\left(n\right)-W\left(1-n\right)\right].$$

Each root of this equation that belongs to the interval $(1/2, 1)$ defines an equilibrium where $\rho^* > 0$, $\mu^* > 0$, and $\lambda^* = 0$ if it also satisfies $E[U]_r^* \geq E[U]_l^*$. Again, multiple roots are possible if γ is large.

Similar properties hold for polymorphic equilibria of the type $\mu^* > 0$, $\lambda^* > 0$, and $\rho^* = 0$.

Example of Pareto-improving tolerance: Consider the deterministic model of Sect. 3 under the following specification:

$$U(i) = \ln c(i) + \beta selfv(i) + \frac{2}{3}\ln socv(i).$$

The incomes from the two occupations are given by:

$$y_a = \frac{2}{3}\left(\frac{1-n}{n}\right)^{1/3},$$

$$y_b = \frac{1}{3}\left(\frac{n}{1-n}\right)^{2/3}.$$

Under laissez-faire, the fraction of those in occupation a is determined by

$$\ln y_a + \frac{2}{3}\ln n = \ln y_b + \frac{2}{3}\ln(1-n).$$

Substituting the expressions for y_a and y_b into this equation and solving it, yields $n^* = 8/9$.

Under tolerance, $selfv(i) = 1/2 = socv(i)$, $\forall i$. The equilibrium in the labor market is then determined by $\ln y_a = \ln y_b$, which yields $n^{Tol} = 2/3$.

Everybody is better off under tolerance rather than under laissez-faire if and only if $U^{Tol} > U^{LF}$, where

$$U^{LF} = \ln \frac{2}{3}\left(\frac{1}{8}\right)^{1/3} + \beta + \frac{2}{3}\ln\frac{8}{9}$$

and

$$U^{Tol} = \ln \frac{2}{3}\left(\frac{1}{2}\right)^{1/3} + \frac{\beta}{2} + \frac{2}{3}\ln\frac{1}{2}.$$

Substituting these two equations in the above inequality shows that the latter is satisfied if and only if $\beta < (4/3)\ln(9/8)$.

Proof of Proposition 4: At the individual level an individual's social esteem is given; thus, the value system is chosen so as to maximize the expected utility from self-esteem. By (1), (2) and (3), in an interior equilibrium, the socialization strategy will satisfy the first-order condition given in the Proposition. The symbolic value of trait b is then implicitly given by

$$\frac{V'(1-v_b)}{V'(v_b)} = \frac{q}{1-q}.$$

Differentiating this equation and using $V'' < 0$ shows that v_b strictly increases with q. **QED**

Proof of Proposition 5: Each individual can be characterized by a type $\theta \in \{M, F\}$ and a matching value,

$$m \equiv \sigma\omega + (1+\omega)(1-v). \tag{11}$$

The latter is the utility that the individual contributes to the partner. It is easy to verify that any stable matching must be assortative, i.e., men with higher matching value form couples with women with higher matching value.

Now, consider the first stage. Instead of choosing a value system, individuals can equivalently be seen as choosing their matching value, the relation between the two variables being given by (11). In a symmetric equilibrium, men and women with the same endowment choose the same matching value. So, let H denote the common distribution of matching value of men and women in equilibrium.

Because matching is positively assortative, a man who chooses m will be matched with a woman whose rank in the distribution of female matching values is $H(m)$, i.e., the same as the man's rank in the distribution of male matching values. Then, that man's utility derived from matching will be $H^{-1}(H(m)) = m$, i.e., the matching value chosen by that man.

Hence, making use of (9) and (11), an individual's choice of values is optimal if it maximizes

$$U = \ln(v) + \sigma\omega + (1+\omega)(1-v).$$

Manipulating the corresponding first-order condition yields

$$v = \frac{1}{1+\omega},$$

which establishes the second part of the Proposition. **QED**

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