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A theory of tolerance

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A THEORY OF TOLERANCE

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A THEORY OF TOLERANCE

Abstract

We develop an economic theory of tolerance where lifestyles and traits are invested with symbolic value by people. Value systems are endogenous and taught by parents to their children. In conjunction with actual behavior, value systems determine the esteem enjoyed by individuals. Intolerant individuals attach all symbolic value to a small number of attributes and are disrespectful of people with different ones. Tolerant people have diversified values and respect social alterity. We study the formation of values attached to both endogenous and exogenous 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.

JEL Code: D1, O1.

Keywords: value systems, tolerance, modernity.

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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 is typically welcome because it promotes peaceful coexistence between diverse groups and favors 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 plenty of countries. Those surveys show that present preindustrial 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 can contribute original insights into the determinants and consequences of tolerance. In the current paper, we offer an economic approach based on optimizing agents that helps to understand what tolerance is and how it develops. The model applies a novel theory of symbolic values, that we also apply in a companion paper (Corneo and Jeanne, 2007).

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.¹

¹Many economists have studied the implications of a concern for social esteem, see Fershtman and

We study equilibria in which not only resource allocation and relative prices but also symbolic values are endogenously determined. A comparison with price models may illuminate our approach. Associated with each particular market structure, economists have developed formal models to explain how prices form. 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 as providing 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.²

Such a perfect vertical socialization is an idealization. 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. Still, the key role of the family in shaping people's values has been documented in many empirical studies and focussing on this channel delivers multiple insights about tolerance.

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 disrespectful 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. We organize our investigation around three headings: endogenous attributes (e.g. occupation), exogenous stochastic attributes (e.g. homosexuality), and exogenous deterministic attributes (e.g. race). While in some cases it may be debatable how to exactly classify a particular attribute (e.g. religion), this way of proceeding enables us to present the relevant trade-offs in a very clear fashion.

It turns out that the mechanisms that may lead to the spontaneous emergence of tol-

Weiss (1998a) for a review of the literature. Caring about the opinion of others may be wired into human beings as the outcome of evolutionary selection, as argued e.g. by Fershtman and Weiss (1998b). Also instrumental reasons may be at work, see e.g. Corneo and Jeanne (1998). For a discussion of the methodological issues involved in modeling social concerns, see Postlewaite (1998).

²An alternative route followed by the literature is the evolutionary approach, where the preference profile in society is determined by a process of economic selection. In such a framework, the exogenously given preferences are replaced by an exogenous "fitness" criterion which determines the number of individuals with given preferences. See e.g. Frank (1987) and Fershtman and Weiss (1998b).

erance vary, depending on the nature of the attribute. The case of endogenous attributes can be seen most clearly when cast in a model of occupational choice. Along history, different occupations have been invested with very different values and those values have changed a lot. As an example, one may think of the very low value attached to commerce in ancient Rome as compared to Venice in the Middle Ages. Even today, the aura of the financial investor is perceived very differently in different societies and there are some occupations that are almost generally deprived of respect, e.g. sexual workers in some countries.³

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 rather well in which occupation the offspring would fare at best, than 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. If most parents in a community see the future of their children in the same occupation, those who end up in a different occupation suffer from a very low social esteem.

If instead there is uncertainty about the offspring's talent or the future income opportunities associated with the various occupations, a more agnostic socialization is optimal. With uncertainty, an open mind generates an insurance effect: value diversification avoids the risk of very low self-esteem due to the "wrong" combination of values and behavior. We formally show that if the degree of uncertainty about pecuniary rewards to occupations is large enough, in a socio-economic equilibrium individuals may even become perfectly tolerant, i.e. attach the same symbolic value to all occupations.

The identified link between predictability and intolerance squares well with historical records. Traditional pre-industrial societies displayed both rare occupational change (because of entry restrictions and slow technical progress) and low geographical mobility (because of exorbitant mobility costs). This implied a relatively high degree of predictability of future activity and location. This may explain the widely observed craft honour and local patriotism of traditional societies. Craft honour and local patriotism began to vanish when technological and political innovations dramatically increased professional and geographical mobility.

The insurance motive is also key to explain tolerance about exogenous traits that parents cannot observe when they socialize their children. In that case, we show that the symbolic value associated to an attribute increases with the subjective probability held by the parents about their child developing that trait. As a consequence, beliefs

³The current approach can also be applied to study tolerance with respect to illegal, especially criminal, behavior. We leave that topic for future research.

dynamics can be a crucial ingredient to explain changes in tolerance, e.g. with respect to homosexuality.

We show in a simple model that societies may be trapped in an intolerant equilibrium in which 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.

The mechanism by which tolerant values arise is quite different in the case of deterministic exogenous traits, like gender and nationality. We develop a model in which people with different traits bilaterally match in order to exploit some synergy, e.g. through marriage or international trade. If matching is exogenous, parents have no private incentive to inculcate respect for alterity. If matching is voluntary, an individual's value system may work as an asset that improves the individual's competitiveness in the matching game. Tolerance yields 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, in situations where individuals compete for partners, educating to respect for alterity can be seen as an investment prior to matching. Liberalizing matching institutions can promote tolerance.

The rest of the paper is organized as follows. In Section 2, we briefly state the main postulates of our theory of symbolic values and compare it to related approaches. Section 3 develops the model of tolerance with respect to endogenous attributes, while Section 4 deals with exogenous attributes. Section 5 offers a concluding discussion.

2 Symbolic values and related literature

Our theory of symbolic values is based on four postulates:

Postulate 1: Evaluative Attitude

Individuals pass judgments of approval, admiration, etc., and their opposite upon certain traits, acts, and outcomes.

Each individual is equipped with a value system, i.e., 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.⁴

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.

Postulate 2: Approbativeness

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.

Postulate 3: Self-approrativeness

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.

Postulate 4: Consistency

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

⁴A similar approach is adopted in the models of cultural evolution and identity. There, the existence of a culturally relevant trait and that of a social category are taken as given.

by the logic of consistency. It is difficult to systematically approve in oneself acts which one condemns in others, and when one does so, his fellows are quick to point out the inconsistency.

The formation of symbolic values can be studied within a variety of models. As mentioned in the Introduction, this paper focuses on socialization by altruistic parents. 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.⁵ In their model, vertical socialization, along with intragenerational imitation, determines the long-term distribution of cultural traits in the population. Under some conditions, Bisin and Verdier's theory predicts convergence to a culturally heterogeneous 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 children'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 a course of action, 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. The 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 arguments that capture important nonpecuniary motivations of human action. However,

⁵Empirical 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.

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.

Concerns for self-respect and esteem also play a key role in Benabou and Tirole's (2006) model of pro-social behavior. However, 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 new insights concerning 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 Respect for others' activities

Occupation is a central category for defining one's identity and a natural object of evaluation. For most people, work is a defining element of the self, not simply because a large fraction of one's lifetime is absorbed by work but also because it is mainly through work that the person consciously shapes her environment, i.e. expresses her individuality.

In the current Section we study the allocation of value to occupations in a simple model of occupational choice. There are two distinctive activities e.g. craftsman vs. merchant, civilian vs. military profession, manual vs. intellectual worker, employee vs. self-employed, job in the non-profit sector vs. job in the for-profit sector. Parents instill values about those activities into their children. When an individual reaches adult age, his values influence his occupational choice and determine how respectful he is of other individuals, depending on their occupation.

We begin with a deterministic version of the 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

$$v(a, i) + v(b, i) = 1, \quad (1)$$

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. We consider an additively separable specification of preferences,

$$U(i) = S(c(i)) + \beta V(\text{self}v(i)) + \gamma W(\text{soc}v(i)). \quad (2)$$

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:

$$\text{self}v(i) = v(x(i), i). \quad (3)$$

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:

$$\text{soc}v(i) = \int_0^1 v(x(i), j) dj. \quad (4)$$

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

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

⁷An 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.

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.

We are going to characterize a *socio-economic equilibrium*, i.e. 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:

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

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

Proof: 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**

Hence, individuals are completely disrespectful 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. 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

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

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 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 $\tilde{n} \in (0, 1)$ such that $y_a(\tilde{n}) = y_b(\tilde{n})$ and suppose $\tilde{n} \neq 1/2$. The condition $B_a = 0$ can be satisfied at $n = \tilde{n}$ 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 $\tilde{n} < 1/2$, then $B_a(\tilde{n}) < 0$ and B_a is equal to zero for a value of n lower than \tilde{n} . If $\tilde{n} > 1/2$, then $B_a(\tilde{n}) > 0$ and B_a is equal to zero for a value of n higher than \tilde{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.

3.2 Socialization under uncertainty

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.⁸ We refer to the realization of Δ_i as to the income opportunities or the talent of individual i . For

⁸The deterministic model corresponds to the special case where $\Delta = 0$.

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. $\lim_{c \rightarrow 0} S(c) = -\infty$.

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 (child) 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 following conditions:

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

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

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 $[0, \underline{v}_a[$, $[\underline{v}_a, \bar{v}_a]$, and $]\bar{v}_a, 1]$, 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 $\bar{v}_a = 1$, in which case the first or the third interval have zero measure. The intermediate interval collapses to one point $\underline{v}_a = \bar{v}_a$ 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:

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

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

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

From the expression above, it follows that if the interval $[\underline{v}_a, \bar{v}_a]$ contains $1/2$, then in this interval the child's welfare is maximized by $v_a = 1/2$. If the interval $[\underline{v}_a, \bar{v}_a]$ 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 \bar{v}_a if $\bar{v}_a < 1/2$.

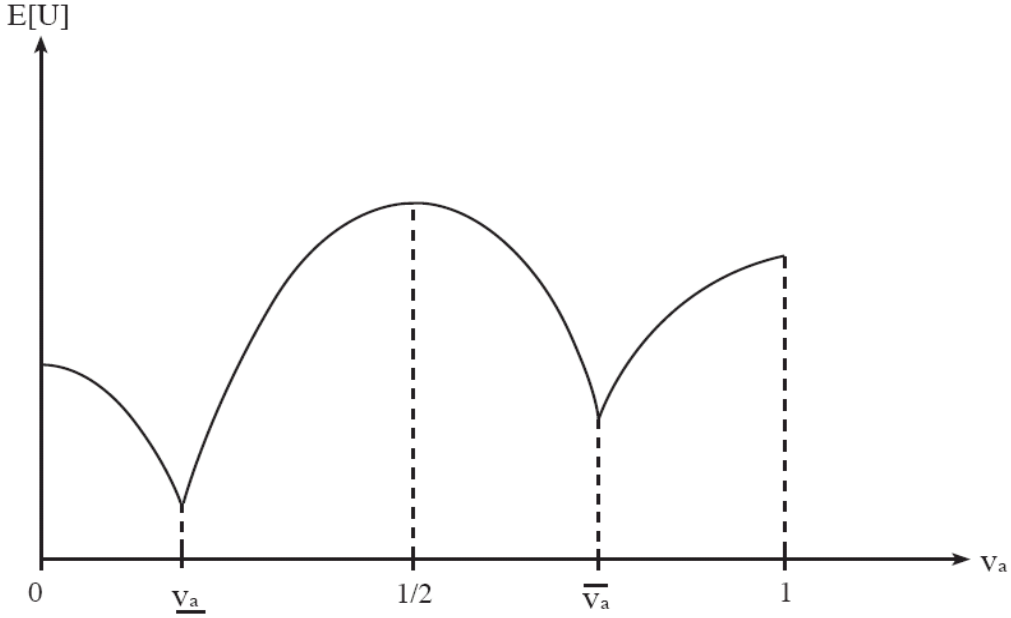


Figure 1: The parents' decision problem

Letting v_m denote the optimal value of activity a in the interval $[\underline{v}_a, \bar{v}_a]$, 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

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

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, $\bar{\Delta} > 0$, such that:*

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

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

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

$$U_{sp}^* = E[U]_m^*, \quad (6)$$

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

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

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,

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

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 $\bar{\Delta}$ 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 $[\underline{v}_a, \bar{v}_a]$ 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 $v_m = \bar{v}_a$. Since $E[U]$ is strictly increasing in $]\bar{v}_a, 1]$, there exists v_a in this interval that yields a higher expected utility than \bar{v}_a . Hence, \bar{v}_a cannot be optimal either. This shows that if v_m is optimal, then $v_m = 1/2$. **QED**

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. Parents adopt in this case a kind of authoritarian paternalism towards their children, i.e. inculcate such value systems that the children are forced by their own values to embrace the occupation that their parents actually chose for them. The result is a society formed by highly complacent and intolerant people.

If the child's income opportunities are quite uncertain, a paternalistic strategy may not be individually rational. 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 for society is more balanced and tolerant people.

Therefore, from a private point of view, authoritarian paternalism may be discarded because it makes the individual carry a too large risk. Conversely, an open mind works as an insurance device with respect to one's self esteem and encourages individuals to exploit 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 $\bar{\Delta}$ 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.*

Proof: 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 $\Delta > \bar{\Delta}$, where $\bar{\Delta}$ is implicitly defined by (6).

Hence, a general equilibrium without intolerant individuals exists if and only if Δ is larger than the threshold level implicitly defined by (6) 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 $\bar{\Delta}^*$ 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 $\bar{\Delta}^*$ is implicitly defined by:

$$\begin{aligned} & S\left(y_a\left(\frac{1}{2}\right)(1+\bar{\Delta}^*)\right) + S\left(y_b\left(\frac{1}{2}\right)(1+\bar{\Delta}^*)\right) \\ & - Sup \left\{ \begin{array}{l} S\left(y_a\left(\frac{1}{2}\right)(1-\bar{\Delta}^*)\right) + S\left(y_a\left(\frac{1}{2}\right)(1+\bar{\Delta}^*)\right), \\ S\left(y_b\left(\frac{1}{2}\right)(1-\bar{\Delta}^*)\right) + S\left(y_b\left(\frac{1}{2}\right)(1+\bar{\Delta}^*)\right) \end{array} \right\} \\ & = 2\beta \left[V(1) - V\left(\frac{1}{2}\right) \right]. \end{aligned}$$

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

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 Efficiency aspects of tolerance

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 explore 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 Respecting others' traits

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, religion, 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.

In this Section, we analyze tolerance with respect to carriers of exogenous characteristics in two simple models. First, we show that the presence of uncertainty can generate a limited amount of tolerance and discuss equity reasons for public policy in support of tolerance in that case. Second, we describe a setting where a heterogeneously tolerant society can emerge in cases where there is no uncertainty about the judgeable trait.

4.1 Uncertain traits

We now assume that 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.

4.1.1 Symmetric information

As in Section 3.1, 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 pecuniarily neutral, i.e. $y_a(n) = y_b(n) = y$ for all n . We 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 .

Proof: 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

$$\frac{V'(1 - v_b)}{V'(v_b)} = \frac{q}{1 - q}. \quad (7)$$

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

QED

If q is close to 0, people will attach a very low value to b ; for instance, if $V(\cdot)$ is logarithmic, then $v_b = q$. 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.

4.1.2 Asymmetric information and learning

We now illustrate how anti-discrimination laws may induce private information to be released and thereby increase the degree of tolerance with respect to exogenous stochastic traits.

Modify the model above so as to introduce asymmetric information and learning along the following lines. First, assume that generations $t = 1, 2, \dots, T$ sequentially choose their

values. Second, assume that there are two possible states of the world: \bar{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 $\Pr\{x(i) = b|\bar{s}\} = \bar{q}$, with $\underline{q} < \bar{q} < 1/2$. 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

$$W((1 - \underline{q})^2 + \underline{q}^2) - W(\underline{q}) \geq \frac{\psi}{\gamma}, \quad (8)$$

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 (8) 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 (8) 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 this 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

$$W(1 - \underline{q}) - W(\underline{q}) < \frac{\psi'}{\gamma}. \quad (9)$$

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 \bar{s} , the individuals realize that the probability to get endowed with trait b is $\bar{q} > \underline{q}$. As a consequence, they invest trait b with value \bar{q} . At $t + 1$, individuals with trait b reveal themselves if

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

By (9) and $\bar{q} > \underline{q}$, this condition is indeed satisfied and no pooling equilibrium exists. Hence, the value attached to trait b increases to \bar{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 value system.

4.2 Tolerance without uncertainty

Hitherto we have argued that individuals may come to invest value on characteristics that they do not possess because their characteristics are not known by the time at which their value system is formed. 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 in reality that some people do pay respect also to the gender, nationalities, and ethnic groups that are not their own.

Tolerance with respect to known hereditary traits can be explained within a model of perfect vertical socialization. Parents may choose tolerant values because they help to increase their child's consumption when the latter is determined through matching with other people.

This mechanism can be explained with reference to various situations: 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 often 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 future 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.

4.3 A simple matching model

The following model is described in terms of a marriage market and 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 distribution of endowment is assumed to be the same for both sexes. We suppose that the common density function is strictly positive on some interval $[0, \bar{\omega}]$, with $\bar{\omega} > 0$. After that couples are formed, every man consumes his woman's endowment and every woman consumes her man'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:

$$v(M, i) + v(F, i) = 1. \quad (10)$$

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,

$$U = \ln(v) + (1 + \omega_p)v_p, \quad (11)$$

where v is the value that the individual puts on own type, ω_p is the endowment of the individual's partner, and v_p is the value that the partner puts on the individual's type. Thus, the first term of the utility function comes from self-esteem, while the second term comes from matching.

The timing of decisions is as follows. First, individuals simultaneously choose their value systems $\{v(M, i), v(F, i)\}$ subject to constraint (10). This step of the game can be interpreted as benevolent parents choosing the values of their children. 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:

Proposition 5 *(i) If matching is exogenous, tolerance does not arise: each individual invests all symbolic value in his own type.*

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

(ii) *If matching is endogenous, there exists an equilibrium in which tolerance arises. In this equilibrium, the value that an individual invests in the other type is $\frac{\omega}{1+\omega}$, where ω is the individual's endowment.*

Proof: Part (i) immediately follows from the fact that utility strictly increases with self-esteem.

In order to prove part (ii), we first consider the matching stage. Each individual can be characterized by a type $\theta \in \{M, F\}$ and a matching value,

$$\mu \equiv (1 + \omega)(1 - v). \tag{12}$$

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 (12). 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 μ will be matched with a woman whose rank in the distribution of female matching values is $H(\mu)$, 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 $H^{-1}(H(\mu)) = \mu$, i.e., the matching value chosen by that man.

Hence, making use of (11) and (12), an individual's choice of values is optimal if it maximizes

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

Manipulating the corresponding first-order condition yields

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

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

Tolerance can only arise if there is competition for partners. When matching is exogenous, there is no incentive to teach respect for the partner's trait and tolerance does not emerge. Under voluntary matching, there is an equilibrium in which parents teach

respect for alterity in order to secure their child a match of better quality. Eliminating restrictions on the choice of partners may therefore promote tolerance.¹¹

5 Conclusion

Maintaining and promoting tolerant attitudes towards social alterity is increasingly recognized as an important contribution to make the world a safer place. In this paper we have proposed an economic theory of tolerance and the conditions under which it spontaneously arises. Individuals have been defined as tolerant if they endorse a diversified value system; a theoretical framework has been developed where those value systems are endogenously determined. Specifically, we have explored the implications of a socialization structure in which altruistic parents control the values of their children. We have investigated how value formation interacts with economic behavior and shown that tolerance may sometimes be predicated on equity or efficiency grounds.

A key insight from our analysis is that parents may face various types of trade-offs when deciding whether to transmit a tolerant attitude, depending on the nature of the attribute that is object of value. Some attributes, like economic activity and sexual orientation, cannot be observed at the time when the value system is formed. In those cases, the advantage of having an open mind increases with the amount of parents' uncertainty because an open mind avoids the risk of ending up with the "wrong" combination of attributes and values. Attributes like gender and nationality are, however, already known at the time of socialization. In those cases, tolerant values can spontaneously arise under competition for partners. Under voluntary matching, tolerance may yield a competitive advantage to its carrier, since the latter can be expected to respect the partner's alterity.

Policy may affect the incentives for parents to transmit tolerant values. Depending on the context, reducing mobility costs, introducing anti-discrimination laws, and liberalizing matching institutions may induce parents to socialize their children to tolerant values.

The analysis in this paper has been carried out in a very simplified framework where benevolent parents are entirely responsible for their children's values. Future research could introduce other channels of cultural transmission into the type of models developed in this paper and examine their consequences for the emergence of tolerance. In this respect, the two following extensions seem particularly promising. First, self-interest on the part of parents may distinctly shape the values that they try to instill in their children.

¹¹Complete intolerance remains an equilibrium outcome also under voluntary matching. If nobody of the opposite sex is expected to be respectful, there is no point in competing for partners because they all yield the same matching value. Then, no value is put on alterity. However, the tolerant equilibrium Pareto-dominates the intolerant one. In contrast to the intolerant equilibrium, the tolerant one is Pareto efficient.

Parents may be concerned about the esteem that they receive from their children as holders of a particular attribute. Then, parents may transmit a value for their own attribute, even if by doing so they encourage behavior that is detrimental to their children's welfare. This modeling might provide insights into the incentives for members of religious minorities to teach a high value for observance of their own religion.

Second, one could model the influence of interest groups, like unions and employers' associations, on horizontal socialization in order to study the interaction between tolerance towards immigrants, migration, and inter-ethnic marriages. An individual's value system could be assumed to be randomly determined according to a probability distribution. The probabilities associated with the various value systems could be a function of both the values taught by parents and the values propagated by interest groups. While parents may be motivated by matching considerations along the lines of the model presented in this paper, interest groups may be concerned about the effects of value systems on the inflow of migrants and, as a consequence, on wages and profits.

Appendix 1: 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,

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

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

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

An equilibrium vector $(\rho^*, \lambda^*, \mu^*)$ is an element of Simplex $\{3\}$ such that if $\rho^* > 0$, then $R(\rho^*, \mu^*) \geq \text{Sup}\{L(\lambda^*, \mu^*), M(\rho^*, \lambda^*, \mu^*)\}$ 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

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

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

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

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,

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

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,

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

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-esteem 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

$$\tilde{B}_a(n) = \frac{1}{2} [S(y_a(n)(1-\Delta)) - S(y_b(n)(1+\Delta))] + \beta[V(1) - V(1/2)] + \frac{\gamma}{2} [W(n) - W(1-n)]. \quad (13)$$

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 $E[U]_r^* \geq E[U]_i^*$. Again, multiple roots are possible if γ is large.

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

Appendix 2: Example of Pareto-Improving Tolerance

Consider the deterministic model of Section 3 under the following specification:

$$U(i) = \ln c(i) + \beta \text{self}v(i) + \frac{2}{3} \ln \text{soc}v(i).$$

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, $\text{self}v(i) = 1/2 = \text{soc}v(i)$, $\forall i$. 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 $\beta < (4/3) \ln(9/8)$.

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