A Theory of Tolerance

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Abstract

We develop an economic theory of tolerance where styles of behavior are invested with symbolic value. 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 have all symbolic value invested in a single style of behavior, whereas tolerant people have diversified values. The proposed model identifies a link between the unpredictability of children's lifestyles and tolerance. Under uncertainty, an open mind performs like an insurance against the risk of suffering a large loss in self-esteem when adult. Fom another angle, tolerance makes people capable of fully exploiting market opportunities. Sometimes, public policies in favor of tolerance can be recommended on efficiency grounds.

Keywords: symbolic values, tolerance, modernity, occupational choice.

JEL-Classification: D1, O1.

1 Introduction

Those who held a basically benign view of Western civilization tend to see tolerance - i.e. respect for diversity - as a fundamental trait of modern 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 and respects people who act in a markedly different way as he does. 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 may 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 countries of all six inhabitated continents. 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 a model based on optimizing agents that helps to understand what tolerance is and how it forms. The model applies a theory of symbolic values, that we present in greater detail in a companion paper (Corneo and Jeanne, 2006).

In our model, each individual is equipped with a value system. The latter maps each element of a set of judgeable lifestyles 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]

In our theoretical framework, the symbolic values endorsed by people are endogenous. We term the equilibrium of a model in which not only ressource allocation and relative prices but also symbolic values are endogenously determined, a socio-economic equilibrium.

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, of course, an idealization. In reality, parents compete with other agencies of socialization like the school, the church, and commercial advertisers, which all invest resources in order to affect the symbolic values of people. Furthermore, oblique transmission of values from non-parental members of the previous generation as well as horizontal transmission from one's peers occur in practice. Still, the key role of the family in shaping people's values has been documented in many sociological studies and, as the current paper shows, focussing on socialization by the family is a fruitful analytic strategy to study tolerance.

The concept of symbolic value leads to a precise definition of tolerance and allows one to address the question of its determinants. In our theory, a person is defined as tolerant if she attaches some symbolic value to characteristics that she does not have, but others may have. From this viewpoint, self-esteem is the opportunity cost of being tolerant: a tolerant person does not reach maximal self-esteem because she allocates some symbolic value to traits that she does not have. Hence, the question of the rise of tolerance can be re-formulated as a question about why values may depart from those that maximize one's self-esteem.

We study the emergence of tolerance in an economic setting, employing the benchmark model of perfect vertical socialization in which parents completely internalize their

[1] Many researchers have studied the economic implications of a concern for social esteem, see Fershtman and 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. Cole *et al.* (1992). For an insightful discussion of the methodological issues involved in modeling social concerns, see Postlewaite (1998).

[2] An alternative route followed by the litereature 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).

children's interests and perfectly control their values. Our main finding is that tolerance arises if parents are sufficiently uncertain about the future material payoffs of different styles of behavior that their children might adopt. With uncertainty, a tolerant education generates a peculiar insurance effect: value diversification avoids the risk of very low self-esteem due to the "wrong" combination of values and behavior. Conversely, if parents can predict the future lifestyle of their children, it is optimal to invest all symbolic value in that style of behavior and the children will develop into intolerant adults.

This mechanism is illustrated in a simple model of occupational choice, in which symbolic values are attached to occupations. The material payoff of an occupation is the income derived from it, which is endogenously determined and subject to a shock. The main result has that if the degree of uncertainty about pecuniary rewards to occupations is large enough, in a socio-economic equilibrium all individuals are tolerant, i.e., they assign some symbolic value to a range of occupations, including those that they do not perform. Put in a slightly different manner, children are raised to be tolerant when the gains from being flexible in taking advantage of market opportunities are large.

The identified link between predictability and intolerance squares rather 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 exhorbitant mobility costs). This implied a relatively high degree of predictability of future activity and location. This explains 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 educational trade-off analyzed in the current paper shows that, from a private point of view, tolerance has both advantages and disadvantages. The responsivness of individual decision-making to material opportunities is a distinct benefit for the person who has enjoyed a tolerant education. But there is also a cost: the loss of self-esteem relative to the case in which the person is raised so as to be proud of what she will do at adult age. This cost of tolerance might contribute to explain the wide acceptance of the idea of "one's given place in society" and the corresponding ostracism against outliers in medieval Europe as well as in some traditional societies today.

From a collective point of view, we show that, besides concerns for social peace and altruistic concerns for minorities, there can be an efficiency argument in favor of a tolerant culture. In an economy with a large fraction of intolerant individuals, styles of behavior tend to be associated with very different social rewards. As a consequence, economic activities are subject to bandwagon effects and are suboptimally chosen in equilibrium.

In contrast, tolerant people attach a similar symbolic value to alternative styles of behavior and therefore exert less influence on the choices made by others. Unless styles of behavior generate some special externalities, the neutrality of tolerant values is likely to promote economic efficiency.

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 without uncertainty, while Section 4 presents the model with uncertain payoffs. The final part of the paper, Sections 5-7, offers a concluding discussion and proposes two complementary mechanisms that can generate tolerance, one involving collective action to correct "socialization failures", and one based on decentralized value formation that does not require uncertainty.

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.

At any point in time, each member of society can be characterized by his own value system, i.e., a way to allocate value to characteristics. Formally, we shall describe the value system of an individual as a function that maps the set of judgeable individual characteristics onto the real line. We take the set of judgeable individual characteristics as exogenously given. It may include both endogenous actions like occupational activity, saving behavior, fertility, religious practices, contributing to public goods – and exogenous traits – like gender and race. In order to formalize the idea that symbolic value may be a scarce resource individuals compete for, we impose a "budget constraint" on the value system of individuals. Under such a constraint, any individual's total amount of value is given, so that granting more value to a characteristic implies that less value is attributed to the remaining ones. In a way, the set of judgeable characteristics is to symbolic values what the set of the states of the world is to beliefs in the standard model of choice under uncertainty.

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-approbativeness

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 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, we here consider only 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.[3] In their approach, 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 theory 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

[3] 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.

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 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, 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 The deterministic model

We now study symbolic values in a deterministic model of occupational choice, in which tolerance does not arise. This provides a useful benchmark of comparison for the next Section, which will show how tolerance can arise in a stochastic version of the same model.

3.1 Assumptions

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. We assume that income derived by an activity is a strictly decreasing function of the number of individuals who practice that activity. If we denote 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 are continuous.[4]

Occupational activities are posited to carry a value that goes beyond the income that they bring to individuals. We thus define the symbolic, as opposed to economic, values of occupations. Each individual attaches symbolic value to occupations and the value that individual i assigns to occupation $x \in \{a,b\}$ 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. The set of all individual values is the value system of the society under consideration.

When allocating symbolic value, individuals are subject to a constraint. Values are inherently relative and individuals cannot increase the value they attach to an activity without reducing the value they attach to the remaining ones. We normalize total symbolic value to unity:

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

The *self-esteem* of an individual is the esteem in which he holds his own occupation:

$$selfv(i) = v(x(i), i),$$

where $x(i) \in \{a,b\}$ denotes the individual's occupation.

The value systems of all individuals contribute to determine the symbolic value of occupations for society as a whole. For occupation $x \in \{a,b\}$ this is given by $\int_0^1 v(x,j)dj$. This allows us to define the *social esteem* in which an individual is held as the average of the esteem granted to his occupation over the whole society:

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

[4] 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 utility of individual i is an increasing function of his consumption, as well as the value of his occupation in terms of self-esteem and social esteem. We consider an additively separable specification of preferences,

$$U(i) = S(c(i)) + \beta V(selfv(i)) + \gamma W(socv(i)),$$

where $c(i)$ is the real consumption of individual i and is given by his income: $c(i) = y_{x(i)}$. We assume that $S(\cdot)$, $V(\cdot)$ and $W(\cdot)$ are strictly increasing and continuous; β and γ are positive parameters that will be useful in comparative exercises on 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 or her child. Second, individuals choose their occupations $x(i)$ conditional on their values. Then, individuals receive their income and consume.

Informally, a *socio-economic equilibrium* is a situation in which each agent chooses his occupation and values so as to maximize his utility function, taking the choices of other agents as given.

3.2 Equilibrium

In this model, a socio-economic equilibrium always exists and is characterized by the absence of tolerance:

Proposition 1 *Each agent puts the maximal amount of value in the occupation that he performs:*

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

.

It is optimal for an agent who knows which occupation he will perform to invest all symbolic value on this occupation, since this increases his self-esteem without affecting the other determinants of his utility. The proof of the Proposition, therefore, 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 tip the balance towards one of the two occupations.

To prepare for the analysis of the stochastic model, we now highlight some relevant properties of the socio-economic equilibrium. By Proposition 1, the net benefit of occupation a relative to occupation b is

$$B_a(n) = [S(y_a(n)) - S(y_b(n))] + \gamma [W(n) - W(1-n)]. \tag{2}$$

The first term on the RHS 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 scarsity 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 RHS in (2) 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.

Thus, concerns for social esteem can lead to conformism.[5] By choosing to invest symbolic value in his own future occupation an individual reduces the social esteem for the other occupation and thus induces other individuals to imitate him. This may generate bandwagon effects in the choice of values and occupations.

In an interior equilibrium, the concern for social esteem magnifies the difference between the size of group a and that of group b. Denote by $\widetilde{n}$ the size of group a for which $y_a(\widetilde{n}) = y_b(\widetilde{n})$ and suppose $\widetilde{n} \neq 1/2$. The condition $B_a = 0$ can be satified at $n = \widetilde{n}$ if and

[5] This property of occupational choice reminds one of observations made by Blaise Pascal in the middle of the 17th century: "*La chose la plus importante à toute la vie, est le choix du métier: le hasard en dispose. La coutume fait les macons, soldats, couvreurs. "C'est un excellent couvreur", dit-on; et, en parlant des soldats:"Ils sont bien fous", dit-on; et les autres au contraire: "Il n'y a rien de grand que la guerre; le reste des hommes sont des coquins". A force d'ouir louer en l'enfance ces métiers, et mépriser tous les autres, on choisit; ... car des pays sont tous de macons, d'autres tous de soldats, etc. Sans doute que la nature n'est pas si uniforme. C'est la coutume qui fait donc cela...*" (Pensées et Opuscules, Larousse, Paris, 39th ed., 1934, p. 28-29).

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 are member of large 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 the material gain of occupations matter for the individual choice.

4 An open mind as an insurance device

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 derived by occupations 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.

We additionally assume that $S(\cdot)$ and $V(\cdot)$ are strictly concave, and that $S(\cdot)$ converges to minus infinity when consumption goes to zero,

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

The sequence of events is as follows. First, the parent of individual i, $i \in [0, 1]$, 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.

4.1 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 choices, 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:

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

Since $V(v_a) - V(1-v_a)$ is strictly increasing in v_a, these conditions define three subintervals 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

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

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 $\overline{v}_a < 1/2$.

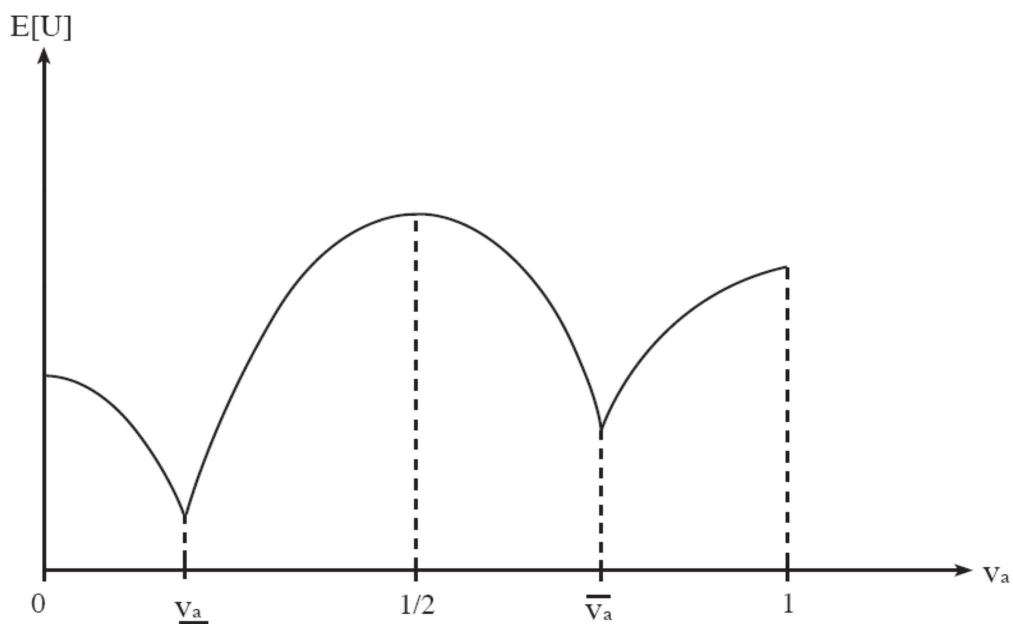

Figure 1: The parents' decision problem

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

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

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,* $\overline{\Delta} > 0$*, 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.*

Proof:

We first show that there exists a unique $\overline{\Delta} > 0$ such that the parent is indifferent between specialization and diversification, i.e.,

$$U^*_{sp} = E[U]^*_m, \tag{3}$$

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 occupations 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 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**

If the amount of uncertainty is negligible, parents optimally put all symbolic value in one activity because doing so maximizes the child's self-esteem without significant consumption losses. However, intolerance performs less well if the child's income opportunities become more uncertain. In order to preserve a high level of self-esteem, the child might perform an activity for which he is not talented. At 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, the child is educated to tolerance. Intolerance would instead make the individual carry maximal risk in terms of self-esteem. Risk averse families maintain flexibility in the choice of occupation by educating their children to tolerance, i.e., by diversifying their values. Thus, an open mind works as an insurance device.

4.2 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 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 $\Delta > \overline{\Delta}$, where $\overline{\Delta}$ is implicitly defined by (3).

Hence, a general equilibrium without intolerant individuals exists if and only if Δ is larger than the threshold level implicitly defined by (3) 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**

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 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.

5 Tolerance as an objective of public policy

The model in the previous Section identifies circumstances under which a tolerant society can spontaneously emerge through parental decisions on children's values. 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 both efficiency and equity reasons for collective action in support of tolerant values.

5.1 Efficiency

In order to illustrate how efficiency concerns may justify policies for tolerance, consider the deterministic model in Section 3. 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.

5.2 Equity

Under certain circumstances, equity concerns may provide a rationale for the promotion of tolerance. Suppose that symbolic value is attached to a trait $x \in \{a, b\}$ that is now exogenous and acquired with a given probability. Suppose also that an individual's income is independent of his trait. As an example, individuals with trait a could be the heterosexual ones and those with trait b the homosexual ones.

Denote by $q \in (1/2, 1)$ the probability for a child to develop trait a. In an interior equilibrium, the socialization strategy chosen by altruistic parents will satisfy the first-order condition

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

If q is close to 1, people will attach a very large value to a. 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 might 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,

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

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 social planner are more or less tolerant than those arising under laissez-faire. As a matter of fact, if W' is constant, the planner prefers less tolerant values.

6 Tolerance as an asset

Our model shows 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 our 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.

We argue that tolerance with respect to those traits can also be explained within the model of perfect vertical socialization. Along with the insurance motive, 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 symbolic value is invested on gender), employment when the race of the employer and that of the employee differ (symbolic value put on race), international trade ventures (symbolic value put on nationality). The key assumption to generate tolerant values is that 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. The intuition is straightforward: under voluntary matching, being tolerant increases one's attractiveness as a future partner because a tolerant partner is respectful. Thus, educating to tolerance can be seen as an investment prior to matching.

6.1 A simple model

We now present a simple formal model of tolerance as an asset. The 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 $[0, \overline{\omega}]$, with $\overline{\omega} > 0$. 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:

$$v(M, i) + v(F, i) = 1. \tag{4}$$

Utility is an increasing function of own consumption, self-esteem and esteem granted by one's partner.[6] Self-esteem is the esteem in which the individual holds his own type, while the esteem that the individuals receives from the partner is the value put by the latter on the individual's type. We specialize the utility function to,

$$U = \ln(v) + (1 + \omega_p)v_p, \tag{5}$$

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 (4). This step of the game can be

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

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 show the following

Proposition 4 *(i) If matching is exogenous, tolerance does not arise: each individual invests all symbolic value in the own type.*

(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.

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,

$$\mu \equiv (1+\omega)(1-v). \tag{6}$$

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 (6). 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 (5) and (6), 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. It is easy to see that tolerance is an increasing function of the initial endowment of individuals.

Notice that complete intolerance remains an equilibrium outcome also under voluntary matching. However, the tolerant equilibrium is Pareto superior, it is also Pareto efficient.

The crucial point is that 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.

7 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 efficiency grounds.

A key insight from our analysis is that a tolerant education may be seen as a rational choice made by parents who want to insure the future welfare of their children. Tolerance emerges if parents are sufficiently uncertain about the future style of behavior of their children. Conversely, we have identified a link between predictability and intolerance.

In line with this finding, pre-industrial European societies displayed both rare occupational change and low geographical mobility. This high degree of predictability of future activity and location may have been the driving force behind the widely observed craft honour and local patriotism. According to our model, a tolerant era began when technological and political innovations generated a substantial increase of professional and geographical mobility.

A second setting where tolerant values can spontaneously arise is voluntary matching. To the extent that matching involves individuals whose social attributes differ, tolerance yields a competitive advantage to its carrier, since the latter can be expected to respect the partner's alterity. So, in situations where individuals compete for partners, educating to tolerance can be seen as an investment prior to matching.

To summarize the flavor of our main findings in a sentence: an economy which is open to mobility and competition is likely to foster tolerant values.

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,

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

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

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

An equilibrium vector (ρ^*,λ^*,μ^*) 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,

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

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,

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

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

$$\widetilde{B}_a(n) = \frac{1}{2}\left[S\left(y_a\left(n\right)(1-\Delta)\right)-S\left(y_b\left(n\right)(1+\Delta)\right)\right]+\beta[V(1)-V(1/2)]+\frac{\gamma}{2}\left[W\left(n\right)-W\left(1-n\right)\right]. \tag{7}$$

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 $\rho^* = 0$.

Appendix 2: Example of Pareto-Improving Tolerance

Consider the deterministic model of Section 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 $\beta < (4/3)\ln(9/8)$.

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