Symbolic Values,
Occupational Choice, and Economic Development

G. Corneo and O. Jeanne*

September 19, 2005 - still preliminary and incomplete

*We are grateful to seminar participants at various universities and research institutes in Berlin, Cologne, Dresda, Edinburgh, Linz, Milan, Vienna, Washington D.C., and Zurich for helpful comments.
Affiliation of authors: Corneo: Department of Economics, Free University of Berlin, CEPR, London, CESifo, Munich, IZA, Bonn; Jeanne: IMF, Washington, CEPR, London.

Address: Department of Economics, FU Berlin, Boltzmannstr. 20, 14195 Berlin, Germany.

Abstract

We present a general framework for thinking about symbolic values in economic settings. Our theory enables one to think about the value systems that are consistent with a given resource allocation, and the resource allocations that can be supported by a given value system. Thus, it naturally leads to the notion of a "socio-economic equilibrium", the efficiency properties of which can be studied using the standard tools of economic analysis. In order to illustrate the potential of our theoretical framework for helping understanding key economic issues, we develop simple models in which people attach a symbolic value to occupations. The models shed some light on the transition from traditional to modern values, the emergence of tolerant societies, and the possibility of failing economic development because of a cultural trap.

Keywords: symbolic values, esteem, occupational choice, develpoment.

JEL-Classification: D1, O1.

1 Introduction

Some personal characteristics - like professional activity, wealth, titles, awards, etc. - seem to be invested with "symbolic values" by human beings. These values determine the esteem that individuals receive from other individuals, as well as their self-esteem. These values are "symbolic" in the sense of being immaterial: they affect the well-being of individuals (they are values) but without altering their consumption of material goods (they are symbolic).

The concept of symbolic value that we develop in this paper is related to ethics. Some activities, like stealing, are deemed to be "morally wrong" and have a low symbolic value. However, a system of symbolic values is broader than ethics, defined as a set of propositions about the moral worth of human actions. Symbolic values are also about the "aura" that surrounds different activities (e.g., being a soldier, or a merchant, or an artist). So they capture not only the ethics but also the *ethos* of a society. Two societies with the same basic ethical values - as given, say, by the Ten Commandments - may be very different in terms of the values that they attach to various activities. Within a given society, its members may endorse quite different systems of symbolic values.

Symbolic values and the social rewards accompanying them had an important place in the views expressed by classical economists. Adam Smith stressed the dependence of economic choice and behavior upon individuals' "love of praise" and their desire of a favorable self-appraisal. Karl Marx pointed out that societal values tend to vary with the mode of production and put forward the view of a dialectic relationship between economic structure and symbolic superstructure.

Meanwhile, related concepts such as social status, prestige, and stigma have made an inroad into economic models based on optimizing behavior. Pioneering contributions in this area include Boskin and Sheshinski (1978), Frank (1985), Kolm (1972), Moffit (1983), Orosel (1986) and Oswald (1983). In this literature, symbolic values are taken as exogenously given and their consequences upon resource allocation are scrutinized. By way of an example, some models posit that individuals attach a symbolic value to being perceived as wealthy. Therefore, individuals engage in conspicuous consumption and the competitive equilibrium may be Pareto inefficient.

In contrast to that literature, the current paper presents models in which symbolic values are endogenous. We develop a formal theory of what symbolic values are, how they form, and how they interact with the economic system. Our framework enables one to think about the value systems that are consistent with a given resource allocation, and the resource allocations that can be supported by a given value system. Thus, it naturally leads to the notion of a "socio-economic equilibrium", the efficiency properties of which can be studied using the standard tools of economic analysis.

Symbolic values are likely to be shaped both by evolutionary forces beyond the control of single decision-makers and conscious attempts by individuals and organizations, e.g. the government by means of educational policy or firms by means of advertising campaigns. Both mechanisms can be embedded in our theory. The current paper, however, is devoted to the study of conscious value formation. Specifically, we investigate fully decentralized processes of value formation, occurring when parents choose the symbolic values of their children.[1] Thus, we extend the rational-choice paradigma of neoclassical economics to the realm of value judgements.

Our theory of symbolic values is related to a relatively small literature that aims at explaining moral sentiments, social customs, and cultural traits using the tools of economic analysis.

Some economic theorists, like Frank (1987) and Fershtman and Weiss (1997), forcefully argued that symbolic values may be determined by a process of evolutionary selection. For instance, attaching value to honest behavior may be a trait that is evolutionary stable because individuals endowed with it can be trusted and therefore have more trade partners than those who lack the honesty trait.

It seems likely that some values, like those giving rise to parental altruism, may be genetically inherited. However, systems of symbolic values change too quickly to be explained entirely by natural selection. Variation of symbolic values, which is the main object of our investigation, is likely to be foremost the outcome of processes of cultural transmission.

A major advance in the economics of culturally transmitted symbolic values was made by Akerlof's (1980) model. In his theory of social custom, a fraction of the current generation, the believers, may attach a symbolic value to a given behavior. If there are fewer individuals following that behavior in the current generation than there are attaching a value to it, there will be fewer believers in the next generation, and vice versa. Hence, the symbolic value of behavior is determined by past social practice. This is consistent with psychological studies which suggest that almost any stable state of affairs tends to become accepted as a code of behavior.

In Akerlof's theory the number of believers in the code is endogenous, but the code

[1] Under fully centralized value formation, a social planner may choose the entire value system of society. Alternatively, the value system may be seen as centrally chosen via a democratic process, e. g. majority voting. We leave the analysis of centralized value formation for a future investigation.

itself is exogenous. His theory does not explain the origin of the symbolic value attached to a behavior, which is the goal of our theory.

The evolutionary approach and Akerlof's theory of social custom share the idea that symbolic values result from anonymous processes occurring in society at large. In contrast, Bisin and Verdier (2000, 2001) have developed a theory in which parents purposely socialize their children to selected cultural traits. This 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 has in common with Bisin and Verdier's theory a focus on the family as a fundamental locus of cultural transmission. However, these two theories markedly differ in two respects.

First, Bisin and Verdier assume that parents want their children to have the same cultural trait they have. 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. If the economic environment is stable, parents with imperfect empathy always want to transmit their own preferences to their children.

In our theory, parents choose the value system of their children so as to maximize the children' utility or a weighted sum of theirs and their children's utility. Thus, benevolent parents may choose to socialize their children to values that differ from their own if this is in their children's interest. We do not assume that parents want to instill their values in their offsprings.

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 conjonction 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. Notice, however, that also Bisin and Verdier's theory works with an additional argument in the utility function, namely the offspring's preference parameter.

The aim of the current paper is twofold. First, we lay down the basic ingredients of a theory of symbolic values. Second, we employ that theory to shed light on some basic aspects of economic development.

We study three simple models of occupational choice in which symbolic values are attached to occupations. In these models, individuals choose between two occupations, e.g. being hunter vs. farmer, laborer vs. soldier, peasant vs. factory worker, or landlord vs. entrepreneur.

The aim of the first model is mainly pedagogical. It formally introduces the notion of symbolic value into a formal model of optimizing agents and it shows how the wage and the symbolic value of occupations can be jointly determined.

The second model is an attempt to identify conditions under which a society converges towards a homogeneous state in which all individuals share similar values, rather than a fractious state in which different groups endorse radically different values. Our model sheds some light on the sources of tolerance, i.e. a situation in which individuals respect others' activities.

The third model explores the link between economic development and cultural change. The importance of occupational choice, especially the allocation of entrepreneurship, for economic prosperity has been put forward by several authors, including Aghion and Howitt (1992), Baumol (1990), Murphy et al. (1991), and Romer (1990). As stressed by this literature, different occupations are associated with different spillovers on the returns of other occupations. Productive entrepreneurs and rent seekers make quite distinct contributions to the technological knowledge of a society and its overall productivity. Hence, the allocation of human resources to various occupations may be a key factor determining economic growth.

We build on the insights from this literature and on our theory of symbolic values in order to shed light on a fundamental finding of economic historians, namely that take-offs are often accompanied by pervasive changes in symbolic values. For example, in Western Europe, the transition from feudal to capitalistic modes of production was accompanied by a transition from traditional to modern values. Whereas the former emphasize birth, religion, and combact skill, the latter praise work, education, and economic achievement.

Our model explains why value systems change along with economic take-offs. It also shows that a socialization trap may prevent an economy from growing. "Wrong" values may have such an adverse effect on the allocation of human resources, that the economy fails to develop in spite of its favorable preconditions in term of physical capital, knowledge, and protection of property rights. This finding echoes historians' accounts of several industrial "near revolutions" that never went anywhere, like the one in the Roman empire.[2] It is also suggestive of the difficulties encountered nowadays by some less developed

[2] As reported by Baumol (1990, p. 910), by the first century B.C. the Romans knew of virtually every

countries to escape mass poverty.

Finally, we address the question whether symbolic values matter for long-run growth, i.e. whether in their steady states a value-free economy exhibits a different behavior from that of an economy with symbolic values. We show that the answer depends on both the mechanism of value formation and the form of the utility function. [to be completed!]

To our knowledge, in the exisiting literature the only paper devoted to the interactions between occupational choice, economic growth, and symbolic values is the one by Fershtman et al. (1996). In their model, individuals can either accumulate human capital and become managers, or they do not accumulate human capital and become laborers. Accumulating human capital produces knowledge that raises overall productivity, so that economic growth is endogenous. Individuals are posited to care about their occupational status. The status of each occupation is assumed to increase with the average human capital of its members relative to the human capital in the other occupation.

Whereas Fershtman et al. assume that higher social status is bestowed on the occupation that enhances growth, in our model the social esteem of occupations is endogenous and depends on the values that parents transmit to their children. Hence, in our model the social ranking of occupations can but need not mimick their ranking in terms of contribution to overall productivity growth. This is not only more general, it also accords well with the observation that in many socities higher status is associated with activities that are unlikely to promote economic growth, like the clergy and the military. In our model, the quest for social esteem may or may not foster economic growth.

The rest of the paper is organized as follows. In Sect. 2 we present the building blocks of our theory of symbolic values. [to be completed!]

In the conclusion part of the paper we discuss how our model can be supplemented with insights from evolutionary psychology and describe some possible applications of our framework to other fields, like the interactions of symbolic values with the welfare state, crime, and the emergence of political parties and non-profit organizations.

2 Building blocks

Our theory is based on four hypothesis or postulates. We make no claim of originality about those hypothesis, as they have been put forward by plenty of scholars before us, see e. g. the classical survey by Lovejoy (1961), from which we borrow some of the terms we use hereafter.

form of machine gearing that is used today, including a working steam engine. In particular, they had the water mill, which played a crucial role in the take-off of the European economy several centuries later.

In this Section, we merely sketch the crucial ingredients of our theory of symbolic values. We confine ourselves to discussing those features of our theory that arise in the models developed in this paper. The mathematical presentation of our theory is provided in its generality in our companion paper, Corneo and Jeanne (2005).

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. 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 an action implies that less value is attributed to the remaining ones.

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. Actually, at least some modest measure of self-esteem seems to be indespensable to endurable existence.

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 models in this paper do employ Postulate 4. However, as it will become evident, no perfect consistency is required for our theory: small deviations from perfect consistency can be allowed for. The crucial requirement is that one's criteria for judging himself and the others be positively correlated.

People's well-being is supposed to depend upon both self-esteem and the esteem received by other people, along with consumption of goods and services. When choosing a course of action, individuals compare the economic return of actions and the esteem they carry.

In the remainder we introduce symbolic values in otherwise standard models of occupational choice. We deal with simple models in which agents choose between two occupations. We assume fully decentralized processes of value formation, occurring when individuals choose their symbolic values, either for themselves or their children. Evolutionary forces that may drive value formation are discussed in Sect. 6.

In the first model that we develop, the wage and the symbolic value of occupations are jointly determined. That model shows how economic and symbolic values can jointly be explained. As revealed by the model, symbolic values can significantly alter our assessment of how labor markets work. The second model introduces uncertainty in the picture and offers an interpretation of the emergence of tolerant societies. The third model that we present is an overlapping generation model that illuminates the interplay of economic take off and cultural change.

3 Basic Model

3.1 Assumptions

Consider a static economy with no uncertainty, 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. Furthermore, $y_a(n)$ and $y_b(n)$ are assumed to be continuous.

If there are no externalities, the allocation of individuals to occupations is efficient if activity a and activity b yield the same income,

$$y_a(n^{eff}) = y_b(n^{eff}).$$

This equation must hold for an interior allocation in which both occupations are practiced by a strictly positive mass of individuals. If one occupation is more profitable than the other irrespective of the number of individuals who practice it, then the efficient allocation is a corner solution ($n = 0$ or 1).

To illustrate, assume that the good is produced by competitive firms with two types of labor, a and b. The production function is Cobb-Douglas,

$$y = A l_a^{\alpha} l_b^{1-\alpha}, \tag{1}$$

where l_a and l_b are the quantities of type a and type b labor respectively used by the representative firm, $A > 0$, and $\alpha \in (0, 1)$. Each individual is endowed with one unit of labor that he inelastically supplies to firms in a competitive labor market. Then y_a and y_b are the equilibrium wages, given by

$$\begin{aligned} y_a &= \alpha A \left(\frac{1}{n} - 1\right)^{1-\alpha}, \\ y_b &= (1-\alpha) A \left(\frac{1}{n} - 1\right)^{-\alpha}. \end{aligned}$$

In this example, the efficient level of specialization in occupation a is $n^{eff} = \alpha$.

We now introduce the distinctive features of our theory. As mentioned in the Introduction, we assume that occupational activities 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 $i \in [0, 1]$ attaches symbolic value to occupations. 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 $(v(\cdot, i))_{i \in [0,1]}$ is the value system of the society under consideration.

When allocating symbolic value, individuals are subject to a constraint. Individuals may face a "physical" constraint if value is allocated during social interactions which use time and other resources. Or they may face a "psychic" constraint, in the sense that 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. Formally, we impose

$$v(a,i) + v(b,i) = 1, \tag{2}$$

$\forall i$, so that the value of an activity relative to the alternative, $v(x,i) - v(x',i)$, is between -1 and +1. Equation (2) can also be interpreted as setting an upper bound to the intensity of value concerns.

We define the *social esteem* in which the agent is held as the average of the esteem granted to his activity over the whole society. Thus, if the agent performs activity x, his social esteem is given by

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

For an individual i's social esteem we may also write

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

where $x(i) \in \{a,b\}$ denotes the individual's occupation.[3]

We define the *self-esteem* of a individual i as the esteem in which he holds his own occupation:

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

We assume that 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 $V(0) = W(0) = 0$ and $S(\cdot)$, $V(\cdot)$ and $W(\cdot)$ are strictly increasing; 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 (2). This step of the game can be interpreted as a benevolent parent choosing the values of his or her children. Second, individuals choose their occupations $x(i)$ conditional on their values. Third, individuals receive their income and consume.

[3] As mentioned above, esteem could also be defined by reference to intermediate groups, such as family members, friends, neighbors, and colleagues. We consider a family-based measure of esteem in Section 5.

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 choices of other agents as given.

3.2 Results

In this model, a socio-economic equilibrium always exists and is characterized by some interesting properties.

Proposition 1 *(Pride) Each agent puts the maximal amount of value in the occupation that he performs.*

It is optimal for an agent who knows which occupation he will perform to put all the 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.

The self-esteem associated with occupations a and b are respectively given by 1 and 1 and the corresponding social esteems are n and $(1-n)$. It follows that the net benefit of occupation a relative to occupation b is

$$B_a(n) = [S(y_a(n)) - S(y_b(n))] + \gamma [W(n) - W(1-n)] . \tag{3}$$

The first term in the RHS of this equation is decreasing with n because the difference between the income of type a individuals and type b individuals decreases with the relative number of type a individuals. The second term shows that the relative social esteem granted to occupation a is increasing with the number of individuals who value this occupation, n.

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 of the RHS in (3) increases with n from $-\gamma W(1)$ for $n = 0$ to $\gamma W(1)$ for $n = 1$. If γ is large enough this term dominates the other two, implying that there are two stable equilibria, one in which all individuals practice a and one in which they all practice b. Our results are summarized in the following Corollary.

Corollary 2 *If the concern for social esteem is weak enough (i.e., γ is small enough), the equilibrium is unique. If the concern for social esteem is strong enough (i.e., γ is large enough), the total return to occupation a is increasing with the number of individuals who practice it. Then there may be two stable equilibria, one in which all individuals choose occupation a and one in which they all choose occupation b.*

This result illustrates how concerns for social esteem can lead to conformism. 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.[4]

In equilibrium, the two occupations yield the same self-esteem, equal to 1. In an interior equilibrium, individuals must be indifferent between valuing and practicing occupation a or occupation b. One must have

$$S(y_a) + \gamma W(socv_a) = S(y_b) + \gamma W(socv_b). \tag{4}$$

Hence, an occupation can yield a higher income if and only if it yields a lower social esteem. This finding can be viewed as an application of the theory of compensating wage differentials, and should be interpreted in its terms. In particular, the same finding would not hold if specializing in occupations entailed disutility that differs across occupations.

Corollary 3 *In equilibrium the occupations yield the same self-esteem, $selfv_a = selfv_b$. In an interior equilibrium, occupation a yields a higher income than occupation b if and only if it associated with a lower social esteem.*

Generically, a socio-economic equilibrium is not Pareto-efficient, because there is no market price for symbolic value. How do values distort the equilibrium? In an interior equilibrium the equilibrium condition (4) can be written,

$$B_a(n) = S(y_a(n)) + \gamma W(n) - S(y_b(n)) - \gamma W(1-n) = 0.$$

[4] On the role of values in determining occupational choice, Pascal wrote: "*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).

We look at *stable* interior equilibria satisfying $B_a'(n) < 0$ (this requires γ to be not too large, as we saw in Corollary 2: if γ is large then stable equilibria tend to be at the corners). If $n^{eff} < 1/2$, then $B_a(n^{eff}) < 0$ and B_a is equal to zero for a value of n lower than n^{eff}. If $n^{eff} > 1/2$, then $B_a(n^{eff}) > 0$ and B_a is equal to zero for a value of n higher than n^{eff}.

Symbolic values bias the equilibrium by magnifying the size difference between group a and group b (reducing the size of group a if it is smaller than $1/2$ and increasing it if it is larger). The reason is that individuals who are member of large groups tend enjoy more social esteem.

Our results are summarized in the following proposition.

Proposition 4 *(Conformism) Social values bias the equilibrium by magnifying the size difference between between group a and group b.*

However, social rewards might raise economic efficiency if occupation-specific externalities exist. By way of an example, occupation a may generate new knowledge, which in turn increases economywide labor productivity. In the case of the Cobb-Douglas technology (1), the parameter A may capture a technological spillover: $A = A(n)$, with $A' > 0$. In the absence of social rewards ($\gamma = 0$), the laissez-faire economy exhibits an inefficient allocation of labor, $n < n^{eff}$. If $\alpha > 1/2$, the existence of social rewards ($\gamma > 0$) increases the number of those in occupation a. A unique, strictly positive, level of γ exists, such that the equilibrium allocation of labor is efficient.

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 talent of the child to be stochastic. This uncertainty can have a major impact on the value system chosen by parents.

4.1 Assumptions

Preferences are represented, as in the basic model, by the utility function

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

with the same properties as above. We additionally assume that $S(\cdot)$ and $V(\cdot)$ are strictly concave and

$$S(c)|_{c\leq 0}=-\infty.$$

An individual's professional talent for the two occupations a and b is now assumed to be stochastic. Agent i earns $y_a+\Delta_i$ if employed in sector a, and he earns $y_b-\Delta_i$ if employed in sector b, where y_a and y_b are defined as in the basic model. Δ_i captures the talent of individual i for activity a; we assume that it is a binomial zero-mean random variable equal to $\Delta\geq 0$ with probability 1/2 and to $-\Delta$ with probability 1/2.

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 (2). The parent is perfectly benevolent and selects the values that maximize his child's expected utility. Second, Nature selects the talent of each individual. Each individual gets to know his talent. Third, individuals choose their occupations $x(i)$, receive their income, and consume.

4.2 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 about the pecuniary and symbolic returns of occupations.

Utility derived from social esteem attached to each activity is exogenous at the individual level; thus, they will simply be denoted by W_a and W_b. Individual (child) i selects activity a if and only if

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

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 talent, he chooses activity b irrespective of his talent, or he chooses activity a if and only he is talented for this activity. These cases respectively arise under the following conditions:

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

Since $V(v_a)-V(1-v_a)$ is strictly incresing in v_a, these conditions define three sub-intervals for the value of activity a, say $[0,\underline{v}_a[$, $[\underline{v}_a,\overline{v}_a]$, and $]\overline{v}_a,1]$, such that the individual chooses activity a (b) irrespective of his talent if and only if the value he puts on activity a is in the third (first) interval, and he chooses the activity for which he is most talented 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 second 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. $\Delta = 0$.

In the three sub-intervals, the level of the child's expected utility is given as follows:

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

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. By contrast, 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 $v_a = 1/2$.[5] 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 $\overline{v}_a < 1/2$.

[5] The optimality of equal values depends *inter alia* on the assumption of equiprobable talents. Suppose that the probability to be talented for activity a is q. Then, the optimality condition reads

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

Then, the optimal v_a is larger than $1/2$ if and only if q does the same.

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

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

Insert Figure [1] about here.

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

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

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

Proposition 5 *There exists a critical threshold in the uncertainty over the child's talent, $\overline{\Delta} > 0$, such that,*

if $\Delta < \overline{\Delta}$, the parent invests all the symbolic value in one activity which his child will practice irrespective of his talent (Paternalism);

if $\Delta > \overline{\Delta}$, the parent invests some symbolic value in each activity and the child chooses the one for which he is the most talented (Permessiveness).

Proof. We first show that there exists a unique $\Delta > 0$ such that $U^*_{sp} \equiv Sup\{E[U]^*_l, E[U]^*_r\} = E[U]^*_m$, $\underline{v}_a < \overline{v}_a$, $\underline{v}_a > 0$ if $U^*_{sp} = E[U]^*_l$, $\overline{v}_a < 1$ if $U^*_{sp} = E[U]^*_r$.

If $\Delta = 0$, then $U^*_{sp} > E[U]^*_m$. If $\Delta \geq Inf\{y_a, y_b\}$, then $U^*_{sp} < E[U]^*_m$ because $S(y_x - \Delta) = -\infty$, $x = a, b$. Since U^*_{sp} and $E[U]^*_m$ are continuous in Δ, there exists a $\Delta > 0$ such that $U^*_{sp} = E[U]^*_m$. We denote it by $\overline{\Delta}$.

Since $\underline{v}_a < \overline{v}_a$ as soon as $\Delta > 0$, the property $\underline{v}_a < \overline{v}_a$ holds for $\Delta = \overline{\Delta}$.

Consider the case $E[U]^*_l < E[U]^*_r$ if $\Delta = \overline{\Delta}$. We have to show that $\overline{v}_a < 1$, i.e. there exists $v_a \in [0, 1)$ such that

$$S(y_a - \overline{\Delta}) + \beta V(v_a) + \gamma W_a > S(y_b + \overline{\Delta}) + \beta V(1 - v_a) + \gamma W_b.$$

Adding to each side of this inequality the amount $S(y_a + \overline{\Delta}) + \beta V(1) + \gamma W_a$ and dividing the results by 2 yields

$$\begin{aligned} & \frac{S(y_a - \overline{\Delta}) + S(y_a + \overline{\Delta})}{2} + \frac{\beta}{2}[V(v_a) + V(1)] + \gamma W_a \\ > \; & \frac{S(y_a + \overline{\Delta}) + S(y_b + \overline{\Delta})}{2} + \frac{\beta}{2}[V(1 - v_a) + V(1)] + \frac{\gamma}{2}[W_a + W_b]. \end{aligned}$$

Now, denote the terms on the two sides of this inequality by $F(v_a)$ and $G(v_a)$, respectively. We thus have to prove that there exists $v_a \in [0, 1)$ such that $F(v_a) > G(v_a)$. To begin with, we show that $F(1) > G(1)$. Notice that

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

by $E[U]_r^* = E[U]_m^*$ and use of the notation $v_m = \arg\max_{v_a} E[U]$ subject to $v_a \in [\underline{v}_a, \overline{v}_a]$. The inequality $F(1) > G(1)$ can thus be written as

$$\begin{aligned} & \frac{S(y_a + \overline{\Delta}) + S(y_b + \overline{\Delta})}{2} + \frac{\beta}{2}[V(v_m) + V(1 - v_m)] + \frac{\gamma}{2}[W_a + W_b] \\ > \; & \frac{S(y_a + \overline{\Delta}) + S(y_b + \overline{\Delta})}{2} + \frac{\beta}{2}[V(0) + V(1)] + \frac{\gamma}{2}[W_a + W_b]. \end{aligned}$$

The latter holds true because $V'' < 0$. By a continuity argument, there exists v_a just smaller than 1 such that $F(v_a) > G(v_a)$.

A similar method shows that $\underline{v}_a > 0$ if $E[U]_l^* > E[U]_r^*$ for $\Delta = \overline{\Delta}$.

Uniqueness of $\overline{\Delta}$ and the statement in the Proposition then follow from observing that

$$\frac{\partial U_{sp}^*}{\partial \Delta} < 0,$$

$$\frac{\partial E[U]_m^*}{\partial \Delta} > 0,$$

$$\frac{\partial \underline{v}_a}{\partial \Delta} \leq 0$$

and

$$\frac{\partial \overline{v}_a}{\partial \Delta} \geq 0.$$

QED

The intuition is straightforward. If the amount of uncertainty is negligible, parents optimally put all symbolic value in one activity because doing this maximizes the child's self-esteem without consumption losses. In such a situation paternalism has zero opportunity costs. Increasing the uncertainty over the child's talent makes paternalism less attractive: in order to preserve a high self esteem, the child might perform an activity for which he is not talented, so that his income and consumption might be too low. At some point, uncertainty becomes so large 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, paternalism is a suboptimal strategy. By putting all value in one activity, paternalism would make the individual carry maximal risk in terms of self-esteem. But individuals are risk averse with respect to the amount of self-esteem they have. Flexibility in the choice of occupation is therefore accompanied by value diversification. An open mind self-insures one's self-esteem.

Uncertainty about occupational opportunities thus leads families to diversify their values. This uncertainty gives rise to a tolerant society where individuals attach some positive value to the activity that they do not perform.

Our results may be interpreted as follows. Traditional 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. Craft honour and local patriotism began to vanish when technological and political innovations dramatically increased professional and geographical mobility. By the same token, nationalism - which may be interpreted as a cheap way to sustain one's self-esteem - may decline if the international mobility of persons increases.

4.3 General equilibrium

At the general-equilibrium level, both the returns of the activities and their social esteem are endogenous. In order to close the model, we need to make an assumption about how individual talents are correlated. We assume completely independent risks. Thus, ex post, one half of the population is talented for a and the other half is talented for b; there is no aggregate risk.

Hitherto we have shown that 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 (we abstract from the possibility of $v_m \neq 1/2$ in what follows). Define, respectively, by ρ, λ and μ the mass of families following each socialization strategy in equilibrium, with $\rho + \lambda + \mu = 1$. 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.

For any (ρ, λ, μ), a socialization strategy is part of an equilibrium if and only if there is no other strategy that delivers a strictly larger expected utility at that given (ρ, λ, μ). By derivations in the previous Subsection, the expected utilities associated with each socialization strategy can be written as

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

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

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

where use was made of the fact that, by the law of large numbers, one half of the number of children of permissive parents will perform activity a, so that $n = \rho + \mu/2$.

Let $(\rho^*, \lambda^*, \mu^*)$ be an equilibrium. If $\rho^* > 0$, then $R(\rho^*, \lambda^*, \mu^*) \geq Sup\{L(\rho^*, \lambda^*, \mu^*), M(\rho^*, \lambda^*, \mu^*)\}$. Analogous conditions must hold in case of $\lambda^* > 0$ and $\mu^* > 0$.

To begin with, notice that, generically, a fully polymorphic equilibrium does not exist. By way of contradiction, suppose it exists. Then, all three socialization strategies are associated with the same level of expected utility. Formally, the fully polymorphic equilibrium is a solution of the following system of three equations:

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

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

$$\rho + \lambda + \mu = 1.$$

The first two equations directly follow from the condition that the expected utilites be equal; the third equation is an identity, which allows one to determine λ, once ρ and μ have been determined by the first two equations. However, as it can easily be checked, this system generally has no solution since one cannot find values of ρ and μ that simultaneously solve the first two equations.

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

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

Straightforward manipulations show that this equation is basically the same condition as (3), which we derived in the previous Section. This is not surprising, since the equilibrium configuration 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 the previous Section corresponds here to the case of non-existence of the equilibrium with both $\rho^* > 0$ and $\lambda^* > 0$. In that case, a monomorphic equilibrium may exist.

Consider now the case where $\rho^* > 0$, $\mu^* > 0$, and $\lambda^* = 0$. This differs from the equilibrium configuration of the previous Section since the population is now partitioned into paternalist families, devoted to activity a, and permissive families with an open mind. Such a configuration could not arise in the model without uncertainty.

In an equilibrium with both tolerant people and intolerant people praising activity a, $E[U]_r^* = E[U]_m^*$ must hold and the hypothetical equilibrium satisfies

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

Using the identities $n = \rho + \mu/2$ and $\rho + \mu = 1$, we can express the equilibrium partition as a function of n. The portion of paternalistic families is given by

$$\rho^* = 2n - 1$$

and the fraction of permissive families results from

$$\mu^* = 2(1-n).$$

Notice that one necessarily has $n > 1/2$.

The net benefit of paternalism relative to value diversification amounts to

$$\widetilde{B}_a(n) = \frac{1}{2}\left[S\left(y_a\left(n\right)-\Delta\right)-S\left(y_b\left(n\right)+\Delta\right)\right]+\beta[V(1)-V(1/2)]+\frac{\gamma}{2}\left[W\left(n\right)-W\left(1-n\right)\right]. \quad (5)$$

Each root of this equation that belongs to the interval $(1/2, 1)$ defines an equilibrium if it also satisfies $E[U]_r^* \geq E[U]_l^*$. Again, multiple roots are possible if γ is large. Permissiveness leads to lower self-estem and lower expected social esteem than paternalism but this is compensated by a larger expected level of consumption.

We now turn to the case of a completely tolerant society, i.e. an equilibrium in which $\mu^* = 1$. In order to show that such an equilibrium can exist, we assume that the two occupations yield the same income, i.e. $y_b(n) = y_a(1-n)$. In this case, the payoff from deviating to paternalism is the same, independently of which value system is chosen, $v_a = 1$ or $v_b = 1$. Thus, we only have to show that the equilibrium condition $E[U]_r^* \leq E[U]_m^*$ can be satisfied.

Let $y_b(1/2) = y_a(1/2) \equiv y$ denote the equilibrium income of the two occupations. By equation (5) and $n = 1/2$, the equilibrium condition for a tolerant society can be written as

$$\frac{1}{2}\left[S\left(y+\Delta\right) - S\left(y-\Delta\right)\right] \geq \beta[V(1) - V(1/2)]. \tag{6}$$

Since $-S\left(y-\Delta\right)$ tends to infinity when Δ tends to y, this condition is surely satisfied if the uncertainty is large enough.

We summarize the findings of this Section in the following

Proposition 6 *If occupational chances are uncertain, in a socio-economic equilibrium some fraction of the population may be tolerant, i.e. accord symbolic value to both occupations. An equilibrium in which the entire population is tolerant exists if the uncertainty is sufficiently large.*

5 Traps, great leaps, and values

We now present an application of our theory to economic development. The allocation of entrepreneurship to various activities is recognized as an important explanatory factor of historic slowdowns and great leaps in economic growth. As emphasized e.g. by Baumol (1990) and Murphy et al. (1991), entrepreneurial persons may devote their talent either to productive or to unproductive tasks, depending on their relative rewards. In Baumol's terminology, productive entrepreneurs correspond to the Schumpeterian ideal of an innovator who introduces new products or cost-saving techniques and thereby adds to the technological level of an economy and to its overall productivity. Unproductive entrepreneurs are successful at innovate rent-seeking procedures, like war and legal gambits, that divert rents to those who exploit them. Societies in which talent is allocated to productive tasks are more likely to experience economic prosperity than those in which talent is employed in rent-seeking activities.

Supporting this view, historical examples can be given of societies that failed to experience an economic take-off despite knowledge of those technologies that could have made such a take-off possible. This knowledge was only put into effective use when societies started to offer higher relative rewards to growth-enhancing activities.[6]

An interesting example is ancient Rome, that failed to put into widespread practical use some of the sophisticated technological developments that have been in its possession because of lack of interest of the upper classes in commerce and industry. By contrast, innovations spread like wildfire in Italy during the Renaissance, a time at which the upper classes were willing to get involved in commerce and industry.

Imperial China during the Middle Ages is another example of a society where rent-seeking activities delivered larger rewards relative to productive activities and that missed the opportunity of an economic take-off in spite of its high level of technological knowledge.

The model in this Section builds on the idea that symbolic values crucially determine the relative rewards of occupations, so that having the "right values" may be key to channel talent into produtive tasks and begin an industrial revolution. We focus on the upper class of a society as a group in which talent is more likely to be found and one in which occupational choices are likely to be strongly influenced by symbolic factors, since the availability of significant nonwage income means that occupational choice has not to be fully determined by pecuniary factors.

Formally, we extend the model of the previous Section in two directions. First, we present an explicitly dynamic model of symbolic values, in which the old socialize the young. Second, we introduce a reference group from which individuals desire to receive esteem; this reference group is an individual's family. Those two ingredients help shedding light on the role that values can play in shaping economic development.

5.1 Assumptions

Consider a model economy over infinitely many time periods periods $t \in \mathbb{Z}$. In each period the economy is populated by a continuum of atomistic families $i \in [0, 1]$. Each individual i_t has one offspring, i_{t+1}. Each individual lives two periods, childhood and adulthood. Individual i_{t+1} is a child in period t and an adult in period $t + 1$. During childhood the individual is socialized by his parent. During adulthood, the individual works, consumes, and socializes his child.

[6]See Baumol (1990), from which most of our examples are borrowed, for more details.

There are two possible economic activities, denoted by a and b. The first activity yields income $y_{a,t}$, the second one $y_{b,t}$. Assume, for the moment being, that the return from each activity is time invariant, i.e. $y_{a,t} = y_a$ and $y_{b,t} = y_b$. To fix ideas, posit

$$y_a > y_b,$$

i.e. a is the efficient and b is the inefficient activity.

Individuals attach a symbolic value to activities. Let $v_a(i_t)$ and $v_b(i_t)$ respectively denote the symbolic value of activity a and b for an agent of dynasty i born at the beginning of period t. An agent socialized to values v_a and v_b will show deference or approbation v_a to people performing activity a and v_b to the others. We denote by n_t the number of those in generation t who perform activity a.

Individuals care about both the opinion of society at large and the one of their family. The *social esteem* of an individual is defined the average of the esteem granted to his activity over the whole society. Thus, if the individual performs activity $x \in \{a, b\}$, his social esteem is given by

$$socv_{x,t} = \int_0^1 v_x(j_t)dj.$$

The *family esteem* of an individual is the one granted to his activity by his family. In each period, any family is formed by two individuals, the father and the son. We define the family esteem of agent i_t as the esteem in which his child holds his activity:

$$famv(i_t) = v_{x(i_t)}(i_{t+1}),$$

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

The *self-esteem* of agent i_t remains defined as the esteem in which he holds his own activity: $selfv(i_t)$ equals $v_a(i_t)$ if the agent does a and $v_b(i_t)$ if he does b.

An individual's utility function increases with the individual's consumption, self-esteem, family esteem, and social esteem. For simplicity, we assume a quasi-linear form,

$$\mathcal{U}(i_t) = \eta U(i_t) + (1 - \eta)U(i_{t+1}),$$

where

$$U(i_\tau) = S(c(i_\tau)) + \beta V(selfv(i_\tau)) + \delta Z(famv(i_\tau)) + \gamma W(socv(i_\tau)),$$

functions S, V, Z, and W are strictly increasing and concave, and $F(0) = \underline{F}$, $F(1) = \overline{F}$ for $F \in \{V, W, Z\}$. The coefficient $\eta \in [0, 1]$ captures the degree of selfishness of a parent towards his child. If $\eta = 0$, parents are only devoted to their children's well-being; if $\eta = 1$, parents do not care about their children's well-being. A decrease in η can be interpreted as an increase in parental altruism.

Individuals select their economic activity and values of offspring so as to maximize their utility function, taking both their own and social values as given. All those values are the results of optimizing behavior of individuals.

5.2 The case of selfish parents

The main insights can also be gained in the extreme case of egoistic parents. Thus, we begin studying the case in which $\eta = 1$.

In equilibrium, each agent maximizes his utility by choice of activity and offspring's values, taking both his own and social values as given and correctly anticipating the number of people in the two activities. As parents perfectly know their activity when children are socialized, optimal values are a corner solution, where the maximal value is put in one's occupation.

Proposition 7 *(Family proudness) Each parent teaches his child the praise of the parent's occupation.*

The intuition is straightforward: in order to maximize approbation from the own family, the individual puts all value in the activity that he performs.

In a steady-state equilibrium, both the economic and the symbolic allocation repeat themselves indefinitely. A possible steady-state equilibrium has everybody doing the right thing, i.e. $n_t = 1$ for all t. We call it an *a-equilibrium*. If such an equilibrium exists, individuals at t teach $v_a(i_{t+1}) = 1$ and $v_b(i_{t+1}) = 0$ to their children.

The utility level attained by agents in equilibrium is given by

$$S(y_a) + \beta\overline{V} + \delta\overline{Z} + \gamma\overline{W}.$$

In order for this to be an equilibrium, there must be no profitable deviation. A deviating agent would choose activity b and optimally teach his child that activity b has maximal value. Then, the hypothetical agent that deviates would obtain a utility level

$$S(y_b) + \beta\underline{V} + \delta\overline{Z} + \gamma\underline{W}.$$

Comparing these expressions shows that an individual never benefits from deviating, since this lowers his income, his self-esteem and his social esteem.

Proposition 8 *An a-equilibrium exists.*

By the same method, a condition can be derived for the steady-state equilibrium in which all agents perform activity b.

Proposition 9 *A b-equilibrium exists if and only if*

$$\beta(\overline{V} - \underline{V}) + \gamma(\overline{W} - \underline{W}) \geq S(y_a) - S(y_b).$$

Thus, a *b-equilibrium* exists if the punishment for deviating, in terms of both self-esteem and social esteem, is larger than the utility from the income that is lost by not practicing a.

There may also be steady-state equilibria in which some dynasties perform a and others perform b. In such an equilibrium, $n_t = n \in (0, 1)$ for all t and all dynasties share values in favor of their own activity. Dynasties that perform a teach $v_a(i_{t+1}) = 1$ and $v_b(i_{t+1}) = 0$; dynasties that do b teach $v_a(i_{t+1}) = 0$ and $v_b(i_{t+1}) = 1$. Equilibria of this kind are therefore characterized by the presence of population subgroups with different activities and opposing values.

Agents of a dynasty specialized in a achieve the utility level,

$$S(y_a) + \beta\overline{V} + \delta\overline{Z} + \gamma W(n).$$

Would such an agent deviate to activity b and socialize his child to it, his utility would be

$$S(y_b) + \beta\underline{V} + \delta\overline{Z} + \gamma W(1 - n).$$

So, no profitable deviation exists for thoses agents if and only if

$$S(y_a) - S(y_b) + \beta(\overline{V} - \underline{V}) + \gamma[W(n) - W(1 - n)] \geq 0. \tag{7}$$

By symmetry, the optimality condition for the dynasties specialized in b is

$$\beta(\overline{V} - \underline{V}) + \gamma(W(1 - n) - W(n)) \geq S(y_a) - S(y_b). \tag{8}$$

Proposition 10 *All $n \in (0, 1)$ that simultaneously satisfy (7) and (8) can be sustained as a steady-state equilibrium.*

5.3 Economic development and cultural change

To specify a growth model, we now assume that the returns from the activities can be time-dependent. We call activity a the *traditional* activity and assume that its return y_a does not change over time. Activity b is referred to as the *modern* activity. We assume that the state of technology of the modern activity today increases with the share of people that performed the modern activity last period. Specifically,

$$y_{b,t} = y_{b,t-1}(2 - n_{t-1}).$$

This assumption says that knowledge does not get lost even if it is not practiced. Moreover, there is a technological externality since those performing the modern activity do not capture the future returns of their activity.

Suppose that at time $t = 0$ we have $y_a > y_{b,0}$ and the economy is in a a-equilibrium. Conceive now a development opportunity in the following sense. In period 1, there is an exogenous shock that raises the income level from activity b above y_a.

If agents did not care about esteem, they would adopt the new activity and the economy would develop. This needs not occur if agents care about symbolic values. As shown above, if people care sufficiently about self-esteem and / or social esteem (β and / or γ large enough), the old equilibrium can persist even if $y_b > y_a$.

The lack of development can be interpreted as a "socialization trap". Given that agents have been socialized to traditional values, they have an incentive to remain in their sector and transmit traditional values to their children.

The historical examples of missed opportunities of economic development quoted above are consistent with our model. In ancient Rome, participation in industry or commerce was accompanied by a low level of social prestige since persons of honorable status were supposed to derive their income from landholding (as absentee landlords), usury, and what has been described as "political payments". Commerce and industry were mainly operated by freedmen, former slaves who bore a social stigma for life.

Imperial China reserved its most substantial rewards in terms of social esteem for those who climbed the ladder of imperial examinations and were thus awarded high rank in the state burocracy. While the state bureaucracy had an overwhelming prestige, high social standing was denied to anyone engaged in commerce or industry, even to those who gained great wealth in the process.

5.4 The case of benevolent parents

The possibility of a socialization trap does not hinge upon the assumption of selfish parents. To see why, consider the other extreme case, where $\eta = 0$. Suppose, as before, that a is the traditional activity, but $y_a < y_b$. In a steady-state equilibrium where occupation a is chosen and praised, each individual attains the utility level,

$$S(y_a) + \beta\overline{V} + \delta\overline{Z} + \gamma\overline{W}.$$

Consider the highest possible payoff for a benevolent parent that unilaterally deviates to teaching the values $v_a(i_{t+1}) = 0$ and $v_b(i_{t+1}) = 1$. The highest possible payoff is obtained if the parent's offspring will choose activity b and socialize his child to the same values. The highest payoff under unilateral deviation, therefore, is

$$S(y_b) + \beta\overline{V} + \delta\overline{Z} + \gamma\underline{W}.$$

Hence, provided that

$$\gamma(\overline{W} - \underline{W}) \geq S(y_b) - S(y_a),$$

the traditional equilibrium exists even if the traditional activity is less efficient than the modern one.

The difference with the case $\eta = 1$ lies in the fact that now only the fear of social stigma impedes the economy to develop. In the previous case, there was also a force internal to the individual, his self-esteem, that prevented agents from undertaking the modern activity.

Clearly, a socialization trap can also exist if $0 < \eta < 1$. In this case, the fear of social stigma will operate exactly in the same form as above, while the fear of loss of self-esteem will only matter with respect to the deviant's self-esteem - not with respect to his child's self-esteem.

5.5 Take-offs and cultural revolutions

According to our model, if the material gain from the modern activity becomes sufficiently large, the traditional equilibrium can be broken and the economy takes off. Such a process is accompanied by a cultural revolution.

Consider the situation sketched above, with a traditional and a modern activity, but assume now that $y_{b,1}$ is so much larger than y_a that the old equilibrium breaks down and the entire population embraces activity b in period 1. As a consequence, the produtivity of the modern activity increases in the following periods and the economy stays on a path of sustained growth.

Generation 0 is the last generation that has been socialized to traditional values and performs activity a. If parents are selfish, the optimal socialization strategy of generation 0 is to put the maximal symbolic value into the traditional activity, so as to get maximal filial respect. So, generation 1, which is the first generation that adopts the modern activity, experiences a conflict between symbolic values and actual choice: according to both social and own values, the traditional activity ranks higher than the new one, still the latter is chosen because of its larger material return. Notice that this moral strain only affects the first generation that performs the modern activity. Generations $t > 1$ are optimally socialized to modern values by their parents.

Our theory can explain the observation made by economic historians that economic development is accompanied by pervasive cultural change. Sometime between 1000 and 1500, in Western Europe the gentry underwent a big metamorphosis, one that transformed thousands of landlords devoted to military activity, oppressing the peasants, and haunting the fox into agricultural capitalists, merchants, and bankers. The aristocratic disdain of work and money making, which had been a cornerstone of the values of the gentry for centuries, vanished. At its place, novel values were embraced, ones that accorded much importance to an individual's ability to accumulate wealth and his education. A few centuries later, the industrial revolution brought to the businessman a degree of respect probably unprecedented in human history.

The transition from feudal to capitalistic relations occurred in different places at different times. For example, at the beginning of the last millenium, the gentry of Venice formed a merchant capitalist elite that reopenend the Mediterranean economy to West European commerce and gave birth to a prosperous economy. At the same time, the gentry in Northern Europe typically lived in isolated rural communities, extracting an income in kind from a servile peasantry.

In explaining this contrast, our theory is closer to Marx than to Weber. According to our model, what matters for having a transition from feudal to capitalistic relations is the payoff difference between the feudal and the capitalistic activity - religious beliefs are not the cause but the result of the economic activities that people perform. The difference in payoffs may have been quite different across regions for a number of factors, like differences in transportation costs and soil fertility. Regions in which the payoff differential in favor of capitalistic activities was sufficiently large experienced both an economic and a symbolic mutation, whereas other regions were imprisoned in a feudal trap by their aristocratic culture.

This can also be instructive for assessing the role of culture in favoring or hampering economic growth today in underdeveloped economies [to be completed...].

The model also suggests ways how a poverty trap from "bad" symbolic values could be broken.

One is urbanization. Medieval cities hosted merchants, craftsmen, money lenders, notaries, and doctors. They valued activity b. For some exogenous factor, e.g. fear of military aggression, the gentry left their castles and moved to the towns. Then, the social esteem of b gets higher for the gentry and lower for the burghers. If the former effect dominates, urbanization leads to capitalism.

Our model suggests that the disruption of family ties may under some conditions favor economic development. As we discussed above, opportunities to develop might be missed because of a socialization trap. However, there are social situations where the impact of parents on children's values is eliminated. This may occur after a war. When a generation of fathers die, children may absorb values they had not internalized otherwise; traditional values are less important for them, hence they may more easily choose new, more efficient, economic activities. This escape from traditional values might contribute to explain the economic miracle after the second world war in countries like Germany, Japan, and Italy.

Another insight relates to the intergenerational effect of a father's job insecurity. If parents anticipate that they will have to abandon their profession, they will transmit open values to children. Which in turn may be more likely to switch to the activities with largest economic return. This may explain why the second generation of immigrants to a country typically displays a very successful economic record.

A further insight concerns the role of free thinkers. These may be formally defined as people who choose their own values, regardless of what their parents taught them and / or people who do not care about social esteem. Our model suggests that a small fraction of free thinkers may be sufficient to destabilize the inefficient equilibrium. Free thinkers may be good for economic growth: they may look around for the activities with the highest economic returns and make those activities socially attractive for the subsequent generations.

6 Concluding discussion

We have presented a general framework for thinking about symbolic values in economic settings. Our theory enables one to think about the value systems that are consistent with a given resource allocation, and the resource allocations that can be supported by a given value system. Thus, it naturally leads to the notion of a "socio-economic equilibrium", the efficiency properties of which can be studied using the standard tools of economic analysis. In order to illustrate the potential of our theoretical framework for helping understanding key economic issues, three simple models have been offered, in which people attach a symbolic value to occupations. The models shed some light on the transition from traditional to modern values, the emergence of tolerant societies, and the possibility of failing economic development because of a cultural trap.

Our theory lends itself to a number of applications, including interactions of symbolic values with the welfare state, crime, and the emergence of political parties and non-profit organizations. [to be completed]

We now review some aspects of our theory of symbolic values that have not been discussed above.

6.1 Parents as a socialization agency

Why do parents transmit values to their children viz. why do the latter let themselves be influenced by their parents? Why do people care about values viz. self-esteem?

We suggest that the human brain is hard-wired in such a way because of evolutionary selection. Evolutionary selection could determine the very fact that values are transmitted - rather than the content of values. Genes endow their carriers with the maximum ability to reproduce themselves. This ability requires information that for humans - unlike animals - evolves at the generational frequency. Hence, genes may optimally endow their carriers with a disposition to transmit information or behavioral rules from one generation to the next. The advantage of intergenerational empathy is that it is malleable and can thus be used as a basis to transmit rules or values that change relatively quickly over time.

In order to see this formally, consider again a model in which individuals choose their sector of activity $x \in \{a, b\}$, but assume that there are no social rewards, i.e. $\gamma = \delta = 0$. Assume that two states of the world are possible: $\omega \in \{\omega_a, \omega_b\}$. If the state is ω_a, activity a yields $y + \Delta$ and activity b yields $y - \Delta$, where $\Delta > 0$. If the state is ω_b, activity b yields $y + \Delta$ and activity a yields $y - \Delta$. Each state occurs with equal probability.

If agents did not care about symbolic values ($\beta = 0$), they would be indifferent between the two activities and randomly choose in which one to specialize. In each state of the world, the expected yield of an individual would be y.

Assume that parents observe a signal $\sigma \in \{\sigma_a, \sigma_b\}$ about the state of the world that will prevail when their offspring will come to perform an activity. Let $p > 1/2$ denote the precision of the signal: $\Pr(\omega = \omega_x | \sigma = \sigma_x) = p$, $x \in \{a, b\}$.

Benevolent parents would like to transmit their information - i.e. a probability distribution over future states of the world - to their children. However, this may exceed the cognitive abilities of children. Then, transmitting values may work as a substitute for the transmission of probability distributions.

If, for instance, a parent observes σ_a, she desires her child to specialize in occupation a. If the child has a predisposition to acquire values from his parent and the child cares about self-esteem ($\beta > 0$), the parent can implement that outcome by choosing symbolic values such that $v_a > v_b$. In this case, the expected yield for the child equals

$$y + (2p - 1)\Delta > y.$$

The private benefit from vertical socialization increases with p, the precision of the signal. Conversely, the less parents know about the opportunities faced by their children, the less beneficial is socialization by parents. The case for paternalism becomes weaker whenever technological and other innovations make it harder for parents to extrapolate from their experiences how their children's environment will look like in the future.

6.2 Horizontal socialization

Values are not only transmitted from one generation to the next, but also within generations. This horizontal socialization occurs in society at large via imitation and learning from peers and role models.[7] Evolutionary anthropologists Cavalli-Sforza and Feldman (1981) and Boyd and Richerson (1985) developed several models of horizontal socialization in which a cultural trait is transmitted like a pathogen in an epidemiological model.[8]

Horizontal socialization could be introduced in our model alongside vertical socialization. From an ex ante point of view, one can define for each young individual a probability distribution over value systems. An individual's actual value system is randomly selected acccording to that probability distribution. The probabilities associated with the various value systems can be assumed to respond to both the values taught by parents and the values endorsed by society at large. More realistically, reference groups could be defined from which an individual is relatively likely to acquire values.

Following Bisin and Verdier (2000), we could further assume that socialization by parents is costly, and that parents can increase the probability of determining their children's values by investing more resources in socializing them. This ingredient may produce further insights into the value system of a society. To the extent that vertical socialization requires parents to spend time with their children, a substitution effect might dominate by which more productive parents spend less time with their children and the social esteem of highly productive occupations is relatively low. If vertical socialization can be bought - e.g. services of private teachers and clubs are used to influence the children's values - an income effect dominates by which wealthier parents are more able to shape values. Then, the values of the affluent tend to be overrepresented in society.

[to be completed...]

[7] Relatedly, one speaks of "oblique transmission" when values are acquired from nonparental adults.

[8] In their models, the mechanism of cultural transmission is exogenous: neither parents nor any other agent choose which values to teach.

6.3 Self-socialization

Sentient individuals are able to exert some influence over their own values e.g. by choosing to have experiences that shape values in a certain way. Furthermore, individuals acquire values sequentially over time, rather than all at once at a single moment in the life cycle.

We could build a multi-period model of one individual that can choose his own values under some constraints.[9] In such a model, self-esteem would be a stock variable, whose contribution to instantaneous utility depends both on one's past actions and current values. This suggests that the problem of self-made values might have some analogy with that of choosing tastes in presence of habit formation. [to be completed]

[9] Relatedly, Akerlof and Kranton (2000) offers a model of identity in which agents may want to incur a cost in order to improve their self-image. Benabou and Tirole (2004) develop a model of beliefs in a just world, in which agents can choose the probability to recall observed signals and can thus affect their own beliefs.

References

Akerlof, G., 1980, A Theory of Social Custom, of Which Unemployment May Be One Consequence, *Quarterly Journal of Economics* 94, 749-75.

Akerlof, G. and R. Kranton, 2000, Economics and Identity, *Quarterly Journal of Economics* 115, 715-753.

Baumol, W., 1990, Entrepreneurship: Productive, Unproductive, and Destructive, *Journal of Political Economy* 98, 893-921.

Benabou and Tirole, 2004, Belief in a Just World and Redistributive Politics, mimeo Princeton University and IDEI.

Bisin, A. and T. Verdier, 2000, Beyond the Melting Pot: Cultural Transmission, Marriage, and the Evolution of Ethnic and Religious Traits, *Quarterly Journal of Economics*, 955-988.

Bisin, A. and T. Verdier, 2001, The Economics of Cultural Transmission and the Dynamics of Preferences, *Journal of Economic Theory*, 97, 298-319.

Boskin, M. and E. Sheshinski, 1978, Optimal Redistributive Taxation When Individual Welfare Depends Upon Relative Income, *Quarterly Journal of Economics* 43, 589-601.

Boyd, Robert and Peter Richerson, 1985, *Culture and the Evolutionary Process*, University of Chicago Press (Chicago IL).

Cavalli-Sforza, L. and M. Feldman, 1981, *Cultural Transmission and Evolution: A Quantitative Approach*, Princeton Univ. Press.

Corneo G. and O. Jeanne, 2005, A Theory of Symbolic Values, mimeo.

Fershtman, C., Murphy, K. and Y. Weiss, 1996, Social Status, Education, and Growth, *Journal of Political Economy* 104, 108-132.

Fershtman, C. and Y. Weiss, 1997, Why Do We Care what Others Think about Us?, in Ben-Ner, A. and L. Putterman (eds.), *Economics, Values, and Organizations*, Cambridge U. Press.

Frank, R., 1985, The Demand for Unobservable and Other Nonpositional Goods, *American Economic Review* 75, 101-116.

Frank, R., 1987, If Homo Economicus Could Choose His Own Utility Function, Would He Want One with a Conscience?, *American Economic Review* 77, 593-604.

Kolm, S., 1972, La Taxation de la Consommation Ostentatoire, *Revue d'Economie Politique*, 65-79.

Lovejoy, A., 1968, *Reflections on Human Nature*, Baltimore: John Hopkins Press.

Moffit, R., 1983, An Economic Model of Welfare Stigma, *American Economic Review* 73, 1023-35.

Murphy, K., Shleifer, A. and R. Vishny, 1991, The Allocation of Talent: Implications for Growth, *Quarterly Journal of Economics* 106, 503-530.

Orosel, G., 1986, Tentative Notes on Prestige Seeking and Pareto-Efficiency, *Journal of Economics*, Suppl. 5, 169-94.

Oswald, A., 1983, Altruism, Jealousy and the Theory of Optimal Non-Linear Taxation, *Journal of Public Economics* 20, 77-87.