

## **PREFERENCES AS HUMAN CAPITAL: RATIONAL CHOICE THEORIES OF ENDOGENOUS PREFERENCES AND SOCIOECONOMIC CHANGES\***

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*We discuss the theoretical and empirical foundations of modern economic theories of cultural transmission. The importance of cultural factors in shaping economic and social transformations has been the focus of a long-standing debate in social sciences since the XIXth Century. Neoclassical economics has remained at the margin of this debate. However, there has been a recent surge of interest among economists for cultural factors. The economic models of cultural transmission borrow the main ideas from the anthropological literature, but endogeneize the efforts parents exert to transmit specific cultural variants or preference parameters. We distinguish between paternalistic models where parents use their own values to evaluate their children's utility, and non-paternalistic or utilitarian models in which parents choose their children's preferences to maximize the children's well-being. We discuss recent examples, focusing in particular on corruption, patience, and work ethic. (JEL: D11, D64, I20, J13, N13, O12, Z13)*

### *1. Introduction*

How important are cultural factors in shaping economic and social transformations? This question has been the focus of a long-standing

debate in social sciences since the XIXth Century. On the one hand, Karl Marx regarded spiritual values as ancillary factors. Production relations constitute, in his opinion, the real foundations upon which the whole cultural superstructure of society stands. Culture, religion and ideology are mere reflections of the material interests of the class in control of the means of production. For example, Protestantism is an

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ideological reflection of the economic changes that occurred in the early stage of the capitalistic development. On the other hand, Max Weber criticized Marx's materialistic perspective, and viewed spiritual factors as independent engines of socioeconomic transformation. The development of a spirit of capitalism was, in his view, a key driving force behind the industrial revolution. Likewise, the emancipation from economic traditionalism was essential in the development of modern capitalist enterprise. Far from being a by-product of changes in the production structure, Protestantism, especially the Calvinist creed, played a major role in forging the modern homo oeconomicus.

The idea that cultural differences are important for economic outcomes was not alien to classical economists. For instance, Adam Smith describes members of different social classes of his time – aristocrats and merchants – as very different human beings, as far as both their values and their behavior are concerned.<sup>1</sup> In contrast, neoclassical economists paid very limited attention to cultural factors until recently. A tenet of neoclassical theory is that preferences are primitive (even psychological) forces that economists interested in resource allocation take as given. Humans like consumption, dislike labor effort, discount future events, love their children, etc., but these are innate traits that do not vary much across groups or over time. Thus, heterogeneity in culture and preference shocks have been traditional items on the list of the extra-economic factors justifying error terms in regressions, fixed effects, etc.

However, there has been a recent surge of interest in cultural factors – most notably heterogeneity in preferences and intergenerational cultural transmission – from both theoretical and applied economists. This sharp change in the profession has triggered a variety of reactions, including skeptical ones. Is culture a new catch-all concept? An admission of failure of

the rational-choice theory? A fashion? Or, in contrast, is it another mutation of economic imperialism, namely, an attempt to extend the realm of rational-choice theory to new terrains? If so, is it fruitful? Will the mutation survive and reproduce? In order to address these questions and motivate the legitimacy of culture as an economic factor, the new research program must establish two points: first, whether cultural factors are indeed important determinants of economic behavior, and second, whether preferences do evolve in response to economic incentives. If this were not the case, it would still be appropriate for economists to focus on traditional rational-choice mechanisms treating culture as an exogenous extraeconomic factor.

## *2. Does Culture Affect Economic Choice?*

In order to focus our discussion, we begin by defining our main concept. The term culture is used to refer to preferences, values, and beliefs that are at least partially learned, rather than inherited, and that vary across groups of individuals in time and/or in space. The term cultural trait has been used to refer to a wide variety of features such as tastes for food, religious beliefs, languages and dialects, beliefs about the role of women in society and fertility practices, views on child labor, personal characteristics such as tenacity, tolerance, honesty, patience, trust in others and work ethic, risk aversion, altruism, social status, and more generally everything that can be shaped or influenced by education, family upbringing and other types of social interactions (e.g., peers). The term cultural variants refers instead to the different manifestations of a cultural trait, e.g., the level of patience or of tolerance for corruption.

Evidence from the World Values Survey (Inglehart et al. 2000) shows that cultural differences are systematically correlated with economic and institutional development. For instance, religion and ethnicity are correlated with trust in others, views on the role of government, the importance of thrift and work ethic, etc. These views, in turn, are correlated with economic outcomes such as savings, redistributions, bilateral trade, and self-employment. Alesina and Glaeser (2004) find that the taste

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<sup>1</sup> Adam Smith (1776) writes:

*“A merchant is accustomed to employ his money chiefly in profitable projects; whereas a mere country gentleman is accustomed to employ it chiefly in expense. The one often sees his money go from him and return to him again with a profit: the other, when once he parts with it, very seldom expects to see any more of it.” (p. 432)*

for redistribution policies differs significantly across countries. The problem with most of these cross-country studies is that they do not establish causal relationships. The economic context in which agents operate can affect their view of the world as much as values can affect their economic choice. For instance, many respondents in former Central Asian Soviet republics attribute economic success mainly to luck and corruption rather than to merit and effort. This is likely to reflect their objective observation without necessarily being its cause.<sup>2</sup>

Some progress can be made by focusing on cultural traits that are very persistent over time, such as religious preferences. Although the original success and diffusion of different creeds may be related to historical socioeconomic circumstances, religious beliefs are very resilient and evolve very slowly. To study how religion affects economic attitudes thus makes sense. In a cross-country study, Barro and McCleary (2004) find that the beliefs in heaven and hell are conducive to higher economic growth, arguably since the expectation of future rewards generates individual behavior favorable for economic performance. In contrast, fanaticism and bigotry are associated with poorer economic performance. Religious beliefs may be the trigger of investments that turn out to be economically productive even though there is no direct link between these beliefs and economic behavior. Botticini and Eckstein (2005 and 2007) argue that Jews originally specialized in artisanship, trade, and finance because of religious reforms that fostered literacy among Jewish farmers. After the reforms, Jews progressively migrated to towns to exploit their comparative advantage in education in skilled urban occupations. Becker and Woessman (2009) document a related finding based on historical data in

nineteenth-century Prussia. There, Protestant counties were found to be more prosperous than Catholic ones, in line with Weber's hypothesis. However, the main effect of religion is through education: Protestants educated children more than Catholics did (arguably, in order to enable them to read the Bible). When one controls for literacy, religion has no significant effect on economic performance.

Another avenue for sorting causality problems is in identifying sources of exogenous variation, such as unexpected institutional changes. Alesina and Fuchs-Schündeln (2007) focus on the fall of the Berlin Wall. After the end of Communism, East German citizens found themselves living in a society that had the same institutional and market rules as West Germans, but with the cultural heritage of the communist experience. Their study documents large differences in preferences. In particular East Germans are more favorable to redistribution and believe significantly more than West Germans that social conditions determine individual success. This result points out at the existence of a feedback between economic organization and preferences.

However, survey evidence raises important questions. Do cultural differences drive differences in actual behavior, or do they only cause different attitudes in survey respondents? Cultural aspects may induce different interpretations and reactions to common questions: people from cultures that stigmatize individualism may refrain from confessing their willingness to indulge in opportunistic behavior. But the extent to which culture actually restrains opportunistic behavior for people in real situations may be a different matter. To address this concern, it is necessary to move from hypothetical survey questions to actual choices. Some interesting observations come from experimental economics. Cultural differences appear to be important when subjects from different cultures are asked to play economic games in labs. Heinrich et al. (2001) compare responses to ultimatum games across different small societies.<sup>3</sup>

<sup>3</sup> In the ultimatum game, an agent proposes a division which the respondent can accept or reject. In the former case the proposed partition is implemented, in the latter neither player receives anything.

<sup>2</sup> In an interesting recent study on culture and development across European regions Tabellini (2007) makes an attempt to address the simultaneity bias problem. He runs a cross-region regression of output on cultural variables (proxied by measures of trust, control and respect according to the responses to questions in the World Values Surveys) using the literacy rate at the end of the XIXth century, and past political institutions as instruments for culture. He concludes that the exogenous component of culture due to history has a significant effect on the current economic development, after controlling for regional characteristics.

They show that the average offer varies significantly across tribes, from a minimum of a 26% for the Machiguenga (Peru) to a 58% for the Lamelara (Indonesia). Large differences are also observed in public good games and dictator games. Bornhost et al. (2006) find significant differences between southern and northern Europeans in a dynamic trust game.<sup>4</sup> Southern Europeans are both less trustworthy and treated less favorably. These studies suggest that cultural differences may lead to actual differences in behavior.

Studies on immigrants and expatriates are also important, as they allow to separate the influence of institutional incentives from cultural biases in real-world scenarios. For instance, it is well known that young male adults in Mediterranean countries, most notably Italy, tend to live longer with their parents than they do elsewhere.<sup>5</sup> It has been argued that this may be a rational response to illiquid local housing markets. However, Giuliano (2007) finds that second-generation southern European male immigrants in the US behave similarly to their counterparts in their country of origin, and live with their parents much longer than young Americans do. Similarly, Fernandez and Fogli (2006) find that the country of origin explains fertility and work behavior of second-generation American women. Moving to expatriates, Fisman and Miguel (2008) analyze the parking behavior of UN diplomats in New York City. Due to diplomatic immunity, diplomatic personnel were not subject to enforcement of parking violations. They find that diplomats from countries classified as highly corrupt based on existing survey-based indices have significantly more parking

violations. Moreover, the differences persist over time.

### *3. Theoretical Models of Cultural Transmission*

The recent economic literature postulates a feedback from the socioeconomic environment and standard economic decisions to the evolution of culture. This hypothesis raises a number of questions. First, going back to Marx, is culture just a mere reflection of material interests? If culture had no autonomy, its dynamics would be of limited interest to economists. Second, what are the vehicles of cultural transmission? Is it mostly the family? Or, in contrast, do peers and the environment play an important role? Are children passive receivers or do they play an active role in evaluating the merits of the different messages? Finally, what motives drive parents? Do they aim at uniformity and group identity – e.g., preservation of languages and traditions? Or do ethical principles, such as instilling the “right” values into their children inspire them? Or do purely utilitarian principles, such as instilling into their children the “successful” values, drive their altruism? Answering these questions require a theory that can guide further empirical research.

The forebear of the economic models of cultural transmission is the path-breaking book *Cultural Transmission and Evolution* (1981) by population geneticists Cavalli Sforza and Feldman (hereafter, CF). The authors develop a theory of cultural change that borrows its language and ideas from genetics and epidemiology; it can be applied to a wide variety of learned phenomena such as languages, social customs and values, religious and political beliefs, and technical innovations. CF summarize the cultural transmission process between a “donor” (who has a particular variant of the trait) and a “recipient” (a naive individual) with a transmission coefficient capturing learning and teaching efforts that represents the probability with which the recipient acquires the donor’s cultural variant. CF’s approach involves considering different modes of transmission which differ by the nature of the relation be-

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<sup>4</sup> *In the trust game, one of the subjects (the sender) receives an amount of money from which he can send any share to the other subject (the receiver). The experimenter multiplies the amount sent by a constant larger than one. The receiver decides how much money to keep and how much to send back to the sender.*

<sup>5</sup> *On October 6, 2004, the Italian finance minister Tomaso Padoa-Schioppa backed the introduction of a subsidy to young people who would rent apartments with the following provocative statement “Mandiamo i bamboccioni fuori di casa” (translation: Let us send mama’s boys out of the home). “Young people who live with their parents – the minister continued – neither marry nor acquire autonomy”.*

tween the donors (parents, other relatives, teachers, political leaders, peers) and the recipients, assuming given transmission coefficients for the particular mode under consideration, and characterizing the long-run stationary distributions in which traits no longer evolve. They discuss several transmission modes, classifying them into three wide categories: vertical, horizontal and oblique transmission. Vertical transmission takes place between parents and offspring, is conservative in nature and may lead either to the coexistence of different variants or to the extinction of a particular variant in equilibrium. Horizontal and vertical transmission take place between unrelated members of society. Under horizontal transmission, the donor and the recipient belong to the same generation, like friends in the school, whereas under oblique transmission the donor belongs to an earlier generation, like teachers. Cultural variants under these modes of transmission spread in the population like infectious diseases. The main long-run prediction of the theory is homogeneity within groups and diversity across unrelated groups.

The economic models of cultural transmission borrow their main ideas from CF, but endogenize the efforts exerted by parents in transmitting a certain cultural variant. These economic models fall into two main categories:

1. Paternalistic models where parents use their own preferences to evaluate their children's utility, and
2. Non-paternalistic models, in which parents choose their children's preferences to maximize their children's well-being.

#### 4. The Paternalistic Cultural Transmission Model

Consider a cultural trait (represented by a preference parameter) that takes values in the set  $\Phi$ . The cultural variants or types are the elements  $\phi \in \Phi$ . Each parent can affect the probability of her child acquiring different variants of the trait by exerting some costly effort  $e \geq 0$ . Let  $f(\phi'; \phi; e)$  denote the probability with which the child of a  $\phi$ -parent is of type  $\phi'$ , given that the parent exerts effort  $e$ . In a paternalistic mod-

el, parents choose  $e$  to solve the following program:

$$\max_e \int_{\Phi} u(x(\phi'); \phi) f(\phi'; \phi, e) d\phi' - c(e; \phi)$$

where  $x(\phi)$  is the vector of optimal "economic" choices, e.g., consumption, occupational choice, etc., of an agent with preferences  $\phi$ . An example of a paternalistic model is Bisin and Verdier (2001), which is closely related to CF, but which endogenizes the transmission probabilities. In their paper, the cultural trait is dichotomous, i.e.  $\Phi = \{1, 2\}$ . Let  $q_{\phi}$  denote the proportion of agents in society with preferences  $\phi \in \Phi$ . The main assumption concerning the transmission probabilities is that the trait can be acquired, either by direct teaching from parents (vertical transmission) or if parents fail, by copying a random member from society (oblique transmission). Hence, if parents do not exert any effort, the probability with which a child acquires  $\phi$  is  $q_{\phi}$ . By assumption, parents with preferences  $\phi$  prefer their own variant, i.e.,  $u(x(\phi); \phi) > u(x(\phi'); \phi)$  for  $\phi' \neq \phi$ , and are willing to spend resources in order to increase the probability with which their children acquire their own variant. Thus, cultural transmission is modeled as a costly investment by utility-maximizing parents who evaluate their children's wellbeing using their own preferences. Let  $e_{\phi} \in (0, 1)$  be the education effort exerted by a parent with preferences  $\phi$  to turn his child into a  $\phi$ -agent. A child will be like the parent with probability equal to

$$p^{\phi\phi}(e_{\phi}) = e_{\phi} + (1 - e_{\phi})q_{\phi} \geq q_{\phi}$$

and will acquire the other preferences with probability

$$p^{\phi\phi'}(e_{\phi}) = 1 - p^{\phi\phi}(e_{\phi}) = (1 - e_{\phi})q_{\phi'} \leq q_{\phi'}$$

Parents with preferences  $\phi$  choose  $e_{\phi}$  to maximize

$$p^{\phi\phi}(e_{\phi})u(x(\phi); \phi) + (1 - p^{\phi\phi}(e_{\phi}))u(x(\phi'); \phi) - c(e_{\phi})$$

where  $c: [0, 1] \rightarrow R^+$  is a monotonically increasing cost function with  $c(0) = c'(0) = 0, c''(e) > 0$

and  $\lim_{c \rightarrow 1} = \infty$ . Once the efforts of the two types of parents are endogenized, the following dynamic equation is obtained:

$$(1) \quad \dot{q}_1 = q_1(1 - q_1)(e_1(q_1, \Delta u^1) - e_2(q_2, \Delta u^2))$$

where  $\Delta u^\phi = u(x(\phi); \phi) - u(x(\phi'); \phi) > 0$ ; is the incremental utility a parent with variant  $\phi$  assigns to his child being like him rather than having the other trait  $\phi'$ , and  $q_2 = 1 - q_1$ . The optimal investment effort,  $e_\phi(q_\phi, \Delta u^\phi)$ , is strictly decreasing in  $q_\phi$  and strictly increasing  $\Delta u^\phi$ . Moreover,  $\phi$ -parents do not invest at all whenever  $q_\phi = 1$ . Hence, the parents' drive to preserve their own cultural variant sustains cultural diversity in equilibrium outcome. More formally, equation (1) features a unique stable steady state which is interior.

#### 4.1 Example: Cultural Transmission of Corruption

Paternalistic models have been applied to the cultural transmission of several traits, from religion to altruism, social status and discrimination. An example of this approach is Hauk and Saez-Marti and (2002) who focus on the cultural transmission of corruption. The authors present a discrete time, overlapping generations model of corruption in which the cultural trait is the willingness to engage in corrupt activities and is transmitted via education from parents to newborn agents. Perfect rationality is assumed not only in economic decisions but also in the process of cultural transmission so that economic variables affect the pattern of values in society. The model allows an examination of the effects of the typical policies as well as educational anticorruption campaigns.

The paper develops a principal-agent model with random matching where every adult agent is matched with a new principal in each period. Agents can be honest *moral* agents who suffer some utility loss when engaging in corrupt activities or opportunistic, *amoral* agents who only care about monetary payoffs. The payoffs are such that amoral agents always find behaving opportunistically worthwhile while moral agents always behave honestly. Each principal offers an agent either of two projects: Project 1

yields a higher payoff to the principal than Project 2 if the agent is honest, but is more susceptible to corrupt behavior. If the principal knew the type of the agent he faces, he would offer task 1 to the moral and task 2 to the amoral agents. The principals can screen the agents and recognize, with positive probability, amoral ones. When the proportion of amoral agents in the population is larger than a threshold value, it is in the interest of the principals to assign everybody to the second task, otherwise it is optimal to condition the assignment on the result of the screening and assigns to task 1 only those agents who look moral. It is in this latter case when to be moral has an economic return. Children acquire preferences via parental upbringing and education. The crucial assumption is that parents evaluate their children's future utility through their own preferences, namely a moral parent suffers the utility loss if the child is corrupt even if the child is amoral.

Due to paternalistic altruism, both cultural variants coexist in equilibrium. More formally, the authors obtain a discrete-time version of (1), and show that for a certain range of parameters, the economy has two steady states: a good equilibrium with low corruption, little output distortion and wide-spread anticorruption preferences and a bad equilibrium with high corruption, high output distortion and widespread tolerance for corruption. In the long run, corrupt behavior and the values sustaining this behavior are self-reinforcing, and this generates multiple equilibria. The theory provides an explanation of why countries at equal stages of economic development may end up with very different levels of corruption. Temporary public education campaigns are successful in reducing corruption if and only if they are sufficiently intensive. The paper can be used to rationalize the successful anticorruption campaign carried out in Hong Kong in the 1970's which was intensive and long. The paper documents that the perception of corruption as a social problem in Hong Kong depends on age (and therefore on the time the different age groups were exposed to the anti-corruption campaign).<sup>6</sup>

<sup>6</sup> For instance, in 1986, 75.1% of the 15–24 age group (subject to the campaign for about 13 years) believed that

#### 4.2 Oblique Transmission

A drawback of the model discussed in the previous section is that it takes an overly simplistic view of how oblique transmission works. In particular, it fails to model how children absorb different values, by simply assuming that when parents efforts are unsuccessful, children copy the variant of a random member of society. In this case, children acquire each variant  $\phi$  with a probability equal to its relative frequency in society,  $q_\phi$ . In a recent paper, Saez-Marti and Sjögren (2008) construct a theory embedding a richer and more realistic model of oblique transmission where children observe more than one person, assign some value or merit to the different variants they observe, and adopt one of them following a probabilistic rule which depends on the relative merit. The resulting oblique transmission process is in general nonlinear, and transmission is biased, in the sense that it favors the acquisition of some of the existing variants. The model can explain a number of biases in cultural transmission that have been documented in the cultural anthropology literature, such as conformism (see, e.g., Boyd and Richerson, 1985). These biases can give rise to multiple steady states and path dependence: in some cases, the initial distribution of variants in the population determine whether there will be uniformity or diversity in the long run. Thus, cultural diversity is not a necessary long-run outcome of the paternalistic model. The reversal is also true: the paper shows that paternalistic parents striving to preserve their culture are no longer necessary to sustain cultural diversity in equilibrium if oblique transmission is biased.

The model explains why some variants become extinct, even though all parents are paternalistic and willing to actively promote them. In

particular, extinction may occur if children are conformist and the fraction of holders becomes small enough. On the opposite front, the theory accounts for the survival of subcultures that are regarded as a burden to societies even though no parent actively tries to transmit the trait – e.g., criminality or religious fundamentalism. The explanation lies in the nature of the learning and socialization process. A variant that is not promoted by any parent may persist if either children are biased in favor of it, or children are conformist and their environment is dominated by individuals holding that particular cultural variant.

In conclusion, the results of this research questions the view that was commonly held in the first-generation models that some paternalism or the desire of parents to preserve some cultural variants is necessary to sustain cultural diversity in the long run. In the next section, we show that cultural diversity can in fact be sustained in the long run in a world populated by purely utilitarian agents who have no concern for the preservation of their own culture or values.

#### 5. The Non-Paternalistic Model

In non-paternalistic (or utilitarian) models, parents evaluate their children's wellbeing using their children's preferences. Transmission is modeled as a costly investment by parents who choose investments optimally by maximizing their children's utility. Parents neither have specific desire to preserve their own cultural variants nor to instill values that they regard as intrinsically good or moral. Consequently, non-paternalistic parents are prepared to instill preferences and cultural variants that differ from their own into their children. This is especially important in changing environments, as preferences can evolve and adapt relatively quickly. For instance, there is a large cultural gap between the young generation of the 1960's and their children. This need not be a sign of a failure of cultural transmission: parents may have realized that their values would not make their children thrive in the individualistic societies of the early XXIst Century.

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*corruption was a social problem, whereas only 54% of the 45–64 age group shared this opinion. In 1977 32% believed that tipping government employees for prompt service is an offense, compared to 72% in 1986. Similarly, in 1977 38% believed under-the-table kickbacks to be a normal business practice, compared to 7% in 1986. In 1998 and 1999 surveys, about 85% of respondents aged between 15 and 24 said they would not tolerate corruption in either the government or the business sector.*

The utilitarian approach models cultural traits as standard economic assets affecting agents' utility and choice. As in growth models, these assets feature some endogenous persistence: children's cultural traits are correlated with those of their parents even when the latter make no specific investments. This correlation can be rationalized by children copying their parent's preferences to some extent – even though parental preferences depreciate unless they are refilled by a sufficiently large investment flow.

### 5.1 Culture as Human Capital

The description of culture as human capital is well-suited to cultural traits that have a direct effect on economic success. A recent literature refers to such economically productive traits as *non-cognitive skills*. These determine how well people can focus on long-term tasks, behave in social interactions, and exert self-restraint. For instance, Heckman *et al.* (2006) and Segal (2006) document that perseverance, motivation, patience, self-esteem, and self-control measured at an early age have large effects on education, labor market and marriage outcomes. They also affect female pregnancy, smoking, crime and other aspects of social life. The quantitative effects of these skills are no smaller than those of cognitive skills as measured by IQ tests. Some of these skills can be identified at an early age. For instance, in a longitudinal study conducted at Stanford University a group of four-year old children were offered a marshmallow, but were told that if they could wait for the experimenter to return after some time, they could have two marshmallows (see Mischel *et al.* (1989)). About one third of the children grabbed the marshmallow right away, while others could wait up to twenty minutes for the researcher to return. Researchers followed the subjects for several years, and found large differences in schooling, marriage and labor market performance. Impatient children more often experienced poor school performance, unsuccessful marriages, low income and bad health.<sup>7</sup>

<sup>7</sup> Similarly results are reported by Reyes-Garcia *et al.* (2007) in an experimental study on the Amazonian tribe of Tsimanes. Patient subjects were found more likely to invest in education and earn a higher income at later stages.

While these findings could be explained by different innate abilities, a number of studies have argued that such non-cognitive skills are malleable, i.e., they are affected by nurture and family upbringing, as well as by schooling, especially at an early age. In several studies Heckman and coauthors (2000, 2006) provide evidence from programs targeting disadvantaged children that the upbringing in early childhood significantly influences non-cognitive skills. This view is echoed by Goleman (1995), who argues that non-cognitive skills are more important than cognitive skills for professional success, and that parents and educators can teach these skills. Other studies show a positive correlation between the behavior of parents and children that is consistent with the transmission of preferences within families. In a study based on PSID, Knowles and Postlewaite (2005) document that parents' propensity for savings has a large effect on both the education outcome and savings behavior of children, even after controlling for standard individual characteristics. This suggests again that patience or self control are important and become transmitted within families. Interestingly, the effect of mothers is larger than that of fathers. Since mothers are on average more involved in children's upbringing, this suggests that the correlation is due to family upbringing rather than pure genetic factors. Similarly, Dohmen *et al.* (2007) using the German Socioeconomic Panel, document that trust and risk attitudes are strongly correlated between parents and children. Cunha and Heckman (2007) summarize the evidence by stating that "*the best documented market failure in the life cycle of skill formation in contemporary American society is the inability of children to buy their parents...*" (p. 6).

### 5.2 A General Model

In this section, we describe a general version of the utilitarian model of cultural transmission. Agents live for two periods. In the first period, an agent is a child. Children are passive, and are assumed for simplicity not to consume (or to consume a share of the household consumption decided by their parents). Their only activity is to learn the cultural traits their parents transmit.



Each adult has one child, and makes all economic decisions for the household.

These include choosing consumption, asset accumulation, occupational choice, labor supply and investments to affect the child's preferences.

Formally, an adult's choice problem can be represented by the following Bellman equation:

$$(2) \quad V(\mathcal{F}, K; \bar{\mathcal{F}}) = \max_{x, \bar{h}, \iota} (K, \mathcal{F}, \iota, \bar{h}, x) \\ + zV(\mathcal{F}'(\bar{h}, \mathcal{F}; \bar{\mathcal{F}}), K'(\iota, K); \bar{\mathcal{F}})$$

subject to

$$(3) \quad \mathcal{F}'(\bar{h}, \mathcal{F}) = \psi \bar{\mathcal{F}} + (1 - \psi) \cdot \mathcal{F} + \Gamma(\bar{h}),$$

$$(4) \quad K'(\iota, K) = (1 - \delta) K + \Xi(\iota),$$

and the constraint that  $\{\iota, \bar{h}, x | K, \mathcal{F}\}$  is feasible. Here,  $\mathcal{F}$  denotes a vector of preference parameters (or cultural variants),  $K$  is a vector of standard economic assets,  $\bar{h}$  is a vector of investments affecting the adult's utility (e.g., these investments require parental time and effort) and the offspring's preferences,  $i$  is a vector of investments affecting the adult's utility and the offspring's wealth, and  $x$  be a vector of choice variables affecting current utility (e.g., consumption, leisure and occupational choice).  $\psi$  and  $\delta$  are depreciation parameters, and  $\mathcal{F}$  can be viewed as the genetic component of preferences – allowed to differ across dynasties. Note that, for simplicity, we assume the process of cultural transmission to be deterministic. Finally,  $z \in (0, 1)$  is a parameter capturing parental altruism.<sup>8</sup> Under some regularity conditions, the value function exists and standard recursive techniques can be applied.

This model represents the smallest deviation from a neoclassical growth model embedding endogenous preferences. The first question is whether such anon-paternalistic model can produce cultural diversity. If all agents are identical, won't all dynasties eventually have the same preferences? First, it is relatively easy to

show that homogenous culture need not be the long-run outcome if members of different dynasties face exogenous differences in the consumption or production set, due to innate abilities or exogenous income processes, for example. To the extent to which such differences affect the incentives for cultural transmission, the endogenous accumulation of  $\mathcal{F}$  can lead to cultural differences across dynasties, or act as multiplier of genetic differences. Perhaps more interestingly, preference heterogeneity across dynasties can arise endogenously even in the absence of any exogenous differences. In other words, even dynasties starting identically, i.e., sharing the same preferences, environment and constraints, can become culturally diverse over time as the result of interactions between investments in preferences and asset accumulation. This happens, in particular, if the equilibrium induces some form of sorting or specialization. Examples include complementarities between preferences and occupational choice, or between skill/physical capital and preference accumulation leading to multiple steady states. We now turn to discuss one such possibility.

### 5.3 Example: The Spirit of Capitalism

An example of the non-paternalistic model of cultural transmission is provided by Doepke and Zilibotti (2008). Each life stage (child and adult) consists of two subperiods. In particular, an adult agent goes sequentially through young and old adulthood. This opens the scope for differences in patience to affect occupational choice, as we will see. To begin with, let us consider a version of the model with no assets other than preferences. In particular,  $\mathcal{F} = \{\mathcal{F}_A, \mathcal{F}_B\}$  where  $\mathcal{F}_A$  and  $\mathcal{F}_B$  are parameters affecting, respectively, the marginal utility of leisure, and the trade-off between first- and second-period consumption (patience or discounting). Also,  $x = \{c_Y, c_O, n_Y, n_O\}$ , where  $c_Y, n_Y, c_O$ , and  $n_O$  denote consumption and labor supply in young and old adulthood, respectively, and  $\bar{h} = \{h_A, h_B\}$  denote investments in appreciation of leisure and patience.<sup>9</sup>

<sup>8</sup> We could also make  $z$  endogenous, although this would complicate the analysis. For this reason we abstract from the possibility that family altruism can be taught.

<sup>9</sup> The notion of patience as an asset that agents can invest in was first introduced in the economic literature by Becker

Financial markets are highly imperfect, preventing agents from borrowing to smooth consumption. No borrowing implies that income and consumption profiles coincide (agents could save but they will never want to do so). There are two groups of agents: landowners and the landless. The landowners' occupational choice is trivial: the rents from their land grant them an enviable income process, so landowners optimally choose to manage their estates. Landless agents can choose between two occupations: agricultural laborer, and urban artisan. Artisan-ship entails a steeper income profile, due, for example, to human capital investments through apprenticeship, journeyman-ship, etc. A high  $\mathcal{F}_B$  increases agents' tolerance for a steep income profile.

More formally, output can be produced by two modes of production: agriculture and artisanship. The production functions are given, respectively, by

$$Y_{AGR} = L^\alpha Z^{(1-\alpha)} \text{ and } Y_{ART} = qH$$

where  $Z$  denotes land (owned by landowners) and  $q$  is an exogenous productivity parameter. Unskilled agricultural laborers are equally efficient at young and at old age, and earns a wage  $w_{AGR} = \alpha(Z/L)^{(1-\alpha)}$ . Skilled artisans, in contrast, use some of the young adult period to acquire skills and experience, so they have fewer efficiency units of labor in young than in old age. This explains why artisans have a steeper consumption profile than laborers.

In the non-paternalistic model, altruistic parents shape their children's preferences in a way that best fits their future needs. Parental investments in patience,  $h_B$ , interact then with the steepness of lifetime income profiles: the incentive to invest in children's patience increases in the steepness of the children's future income profile – thus, parents of artisans-to-be have stronger incentives to invest in patience. Conversely, more patient children will be more

likely to enter professions entailing the delay of material rewards – thus, patient children are more likely to become artisans. The complementarity between patience and steep income profiles imply that, within a given dynasty, the choices of a specific occupation and of preferences suitable for that occupation are mutually reinforcing over time. As a consequence, even if the population is initially homogeneous, preferences and occupations gradually diverge across dynasties. Given the technology (in particular, the assumption of decreasing returns to land) even if the initial population consists of perfectly identical individuals, dynasties sort endogenously into different occupational choices, and this leads to cultural stratification: patient artisans vs. impatient laborers. More specifically, the adult members of the first generation of landless agents may be indifferent between investing in patience or not, as technology and labor market equilibrium provide a break-even condition inducing some agents to specialize in the agricultural and other in the urban technology. Thereafter, the indifference is broken, as some dynasties have accumulated patience capital and others have not. Patient dynasties strictly prefer to be artisans, and impatient dynasties to be laborers. Figure 1 summarizes the self-reinforcing mechanism making artisans and workers embrace different patience levels over time.

Consider, next, the second cultural trait, i.e., the taste for leisure,  $\mathcal{F}_A$ . A high  $\mathcal{F}_A$  increases an agent's marginal utility of leisure, and hence the opportunity cost of exerting labor effort. Parental investments in a taste for leisure,  $h_A$ , hinge on the role of labor effort. Parents who expect their children's income and wellbeing to rely on labor effort will tend to instill them with a strong work ethic, which is the opposite of a taste for leisure. In this respect, artisans and workers have similar incentives, whereas the main difference is between landowners and landless agents. Landowners' earnings consist largely of rents which depend less on labor effort than do wages. These agents expect their children to have more time and opportunity to enjoy leisure-intensive activities: music, literature, fox hunting, etc. Their values may become embedded in social norms: a refined taste for

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*and Mullighan (1997), who consider the problem of a consumer who lives for a finite number of periods and makes a one-time choice of a discount factor. In the same tradition, Haaparanta and Puhakka (2004) emphasize complementarity between agents' investments in their own patience and investments in health that prolong life expectancy.*

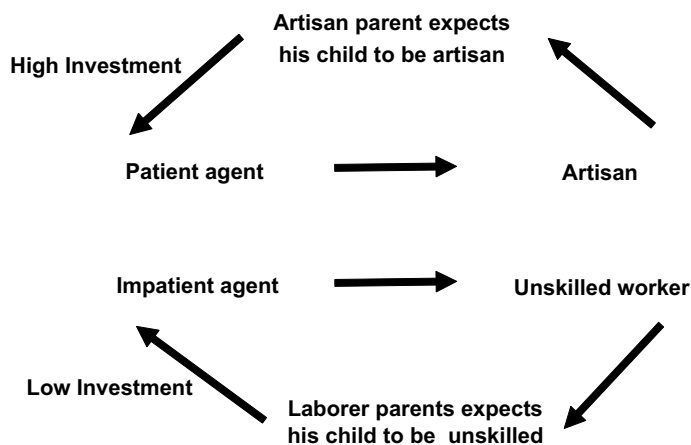


Figure 1. Patience and Occupational Choice.

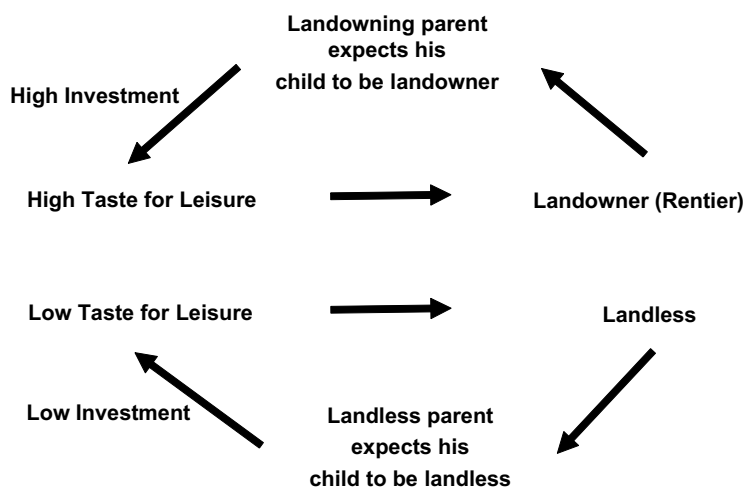


Figure 2. Taste for Leisure and Labor Effort.

leisure is a valuable asset for a gentleman who has plenty of time and opportunities to enjoy and to show it off. In contrast, the same good taste is no gift for the children of the landless whose earnings hinge on work effort. Social norms may arise to transmit the middle-class values, too: thrift, patience and economic success become characteristic of the urban pre-industrial middle class, as well as a disdain for art, culture and any joy of living. The religion they embrace – Protestantism especially in the Calvinist variant – is a vehicle of cultural transmission of these values. Figure 2 summarizes

the self-reinforcing mechanism making artisans and workers embrace different work ethics.

Doepke and Zilibotti (2008) apply the theory to the reversal in the economic fortunes of different social classes at the time of the Industrial Revolution. For centuries, members of the pre-industrial middle class (artisans, craftsmen and merchants) had to sacrifice consumption and leisure in their youths to acquire skills. In response to this economic environment, the middle class developed a system of preferences and values centered on parsimony, work ethic, and delay of gratification. For the landed upper

class, in contrast, neither the work ethic nor patience was particularly valuable, because the members of this class could rely on fairly stable rental incomes from their estates. As a result, the landowning elite not only cultivated refined tastes for leisure, but also grew less future-oriented.

Economic and social historians have documented well the aristocrats' devotion to consumption and leisure. The theory also bears predictions regarding the saving behavior of the different social classes. In particular, low patience should reduce the propensity to save and invest not only in human capital but also in financial markets. This auxiliary implication conforms well with the observation that the landowners, albeit by far the richest group in the society of the time, were underrepresented as stockowners, and instead found themselves going increasingly into debt due to their devotion to lavish expenses (see, e.g., Beckett 1986, Kindleberger 1993).

Before the Industrial Revolution, land remained the main source of wealth, and the growing cultural diversity within society did not lead to changes in the economic ladder. However, the Industrial Revolution brought about new technologies that increased the rate of return to investments and entrepreneurial effort. The new scenario is modeled by Doepke and Zilibotti (2008) as a new opportunity to invest in family businesses (the typical institution of the heydays of the industrial revolution), where physical investments and entrepreneurial effort are complements in production. In this new environment, both patience and work ethic become especially important for economic success: patience translates into high propensity to capital accumulation while the work ethic makes people willing to undertake great effort in activities that have a very high return. High patience and low appreciation of leisure become the spirit of capitalism, a spirit with which the urban middle class is imbued, while the rich aristocracy is not. Thus, the Industrial Revolution led first to economic convergence between the new and the old wealthy groups, and then even to leapfrogging. Eventually, the landed elite was replaced by the industrialists as the economic and social elite.

More formally, once capital is introduced in the model, a new self-reinforcing mechanism linking savings and accumulation of patience arises. Initially, more patient agents have a higher propensity to invest. Once a family has entered entrepreneurship, the investments in physical capital increase the drive to invest in patience. The reason is that investment in capital endogenously steepens utility profiles both within and across generations, i.e., utility drops during the early investment period and increases in the later return periods.

The link between capital investments and investments in taste for leisure is more complex. Initially, agents with a low taste for leisure also tend to invest more, since entrepreneurial effort increases the return on investments. Thus, artisans are the ideal investors, because they are both patient and hard-working. However, this effect is mitigated (or even reversed) over time by the endogenous accumulation of the taste for leisure. Early entrepreneurs have little appreciation for leisure, as historically they come from dynasties relying on labor income alone. However, their descendants inherit the family wealth. Thus, just as the landowners, their consumption depends increasingly on rents (in their case, capital income) and decreasingly on labor effort. As a consequence, the entrepreneurs' descendants work less hard than their forefathers and accumulate taste for leisure, mimicking the culture of the landowning class. Moreover, the fall in labor effort also decreases the return on investments in the family business, leading to a slowdown in accumulation. Interestingly, this cultural evolution of the middle class resembles Weber's secularization hypothesis: the Puritan ethics and the spirit of capitalism give rise to economic outcomes that undermine their very same ethics.

The explosion of demand for leisure activities by the enriched bourgeois middle class in the second half of the 1800's is well-documented by social historians such as Cunningham (1980) and Bailey (1989). The hypothesis that the newly discovered joy of living brings about some economic decline is echoed by Alfred Marshall (1920) who writes: "*It would at first sight seem likely that business men should constitute a sort of caste; . . . But the actual state of things is*

very different. . . . [W]hen a man has got together a great business, his descendants often fail, in spite of their great advantage. . . . When a full generation has passed . . . then the business almost invariably falls to pieces.” Economic historians document evidence in favor of the so-called Carnegie conjecture. In a sample of 1149 British business leaders born between 1789 and 1937, Nicholas (1999) finds that third-generation entrepreneurs clearly underperformed relative to firm founders or managers. Interestingly, these findings are at odds with a purely genetic view of entrepreneurial skills and preference transmission, and also with a paternalistic model of cultural transmission, since both predict a strong intergenerational persistence in preferences. Instead, the results are consistent with the non-paternalistic model of cultural transmission presented in this section, where parents respond to the changing conditions by contributing to forming preferences and values that partially differ from those with which they had been imbued.

## 6. Conclusions

In this paper, we reviewed the two main theoretical approaches to cultural transmission in economics. The first – that we labeled paternalistic transmission – entails a larger deviation from standard-rational choice theory. The wisdom of this theory is that agents must desire preserving some cultures and values for full convergence to culturally homogenous societies not to occur. However, recent papers introducing an explicit active role for children in the culture acquisition process – oblique transmission – have challenged this wisdom even within the framework of paternalistic transmission (see, e.g., Saez-Marti and Sjögren 2008, Saez-Marti and Zenou 2008). The second – that we labeled non-paternalistic transmission – argues that cultural diversity can be sustained in the long run even in initially homogenous societies where agents have perfectly utilitarian preferences, as long as economic incentives induce some specialization and social division of labor. The non-paternalistic literature emphasizes that endogenous preferences can strengthen the

process of specialization. Moreover, in particular historical instances, endogenous preferences may lead to leapfrogging and reversal of fortune across different social groups. The theory has been recently applied by Doepke and Zilibotti (2005 and 2008) to revisit the classical question of how important cultural and religious factors have been in determining the socioeconomic transformations that occurred at the time of the industrial revolution.

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