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Do Markets Promote Prosocial Behavior? Evidence from the Standard Cross-Cultural Sample.

E. Anthon Eff*
Malcolm McLaren Dow*

Abstract

Recent experimental games conducted by ethnographers (Henrich et al. 2004) have shown that groups with higher levels of market integration exhibit higher levels of prosocial behavior. In order to see whether these results are confirmed in a broader ethnographic sample, this paper draws from the Standard Cross-Cultural Sample variables measuring the degree to which a culture seeks to inculcate generosity, honesty, and trust. Using these as dependent variables, models are developed where market-related variables are among the independent variables. The paper uses the methodology developed by Dow (2007) to correct for Galton's problem, and uses multiple imputation to deal with the problem of missing data. The results fail to confirm a systematic association between generalized prosocial behavior and market integration.

Key words: prosocial behavior; multiple imputation; market integration; Galton's problem

JEL category: R12, F16

* E. Anthon Eff, Associate Professor, Department of Economics and Finance, Middle Tennessee State University, eaeff@mtsu.edu

* Malcolm McLaren Dow, Professor Emeritus of Anthropology and Mathematical Methods in the Social Sciences, Northwestern University, mmd383@northwestern.edu

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I. Introduction

Two actors participate in the ultimatum game. One (the *proposer*) is given a sum of money and told that she must divide it with another—anonymous—person (the *responder*). The proposer is given one chance to propose a division of the money. If the responder rejects her offer, then both get nothing; if the responder accepts her offer, then both receive their agreed-upon share.

A strict, narrow, and somewhat naïve definition of rationality as income maximization would suggest that the proposer offer a tiny fraction of the prize to the responder, who would accept that tiny fraction since something is always better than nothing. Experiments have shown, however, that subjects (mostly university students) do not behave as strict income maximizers (Henrich et al. 2004: 8-9). Modal offers are typically around 50 percent, with a mean close to 45 percent of the prize, and if the proposer offers too little to the responder, the responder is likely to reject it (Henrich et al. 2004: 19). Clearly, subjects behave in a much more prosocial way than a narrow definition of rationality would assume. Experiments of this type have done much to develop more realistic models of human exchange behavior.

In 1996, experiments done among the Machiguenga in the Peruvian Amazon attracted a great deal of interest. The Machiguenga behaved much more like strict income maximizers, and much less prosocially, than the subjects of experiments conducted in affluent industrialized countries (Henrich et al. 2004: 11). Subsequently, work was carried out by ethnographers in a variety of cultures around the world (Henrich et al. 2004: Efferson et al. 2007; Lesorogol 2007). These results showed that players in different cultures behaved in strikingly different ways. While the modal offer in affluent industrialized cultures is consistently 50 percent, the modal offers across ethnographic samples range between 15 and 50 percent (Henrich et al. 2004: 19).

Henrich et al. (2004: 33-35) found that individual-level data such as age, sex, exposure to markets, and wealth do not explain individual-level variations in offers and rejections; the crucial determinants are group-level measures in market integration[1] and payoffs to cooperation. Lesorogol (2007: 924) also found that individual-level characteristics failed to predict the results of dictator games[2] played among the Samburu, except in *contextualized* games where players were encouraged to apply prevalent social norms for meat division as the context for their offers. Efferson et al. (2007: 917) conducted dictator games in

[1] The term "*Market Integration,"* as employed by Henrich et al. (2004: 28-29) refers to a composite measure containing three variables: 1) frequency of market exchange (market integration); 2) amount of centralized decision-making taking place above the household (sociopolitical complexity); and 3) size of local settlements (settlement size). Each of these variables is formulated as the rank of a particular society (among all of the Henrich et al. societies) for that dimension. The composite is simply the mean of the three ranks.

[2] The dictator game is like the ultimatum game, except that the player who receives the offer cannot reject it.

two locations, one in altiplano Bolivia and the other a multiethnic village in Tanzania. They found that individual-level measures of market integration and participation in cooperative activities did, in fact, partially predict game results for Bolivia, while ethnic affiliation was overwhelmingly the most important determinant of game results in Tanzania. These results suggest that variations in game behavior are more likely to be determined by the culture in which the individual is embedded, rather than by the unique position or life history of the individual within the culture. And, taken together, they raise interesting questions regarding the cultural determinants of prosocial behavior.

In some ways these results are not particularly surprising. Years of experiments with college students in industrialized countries have also failed to explain offers or rejections with demographic data such as sex, age, or income (Henrich et al. 798). On the other hand, querying players on their ideological or social preferences typically yields variables that explain game results quite well (Henrich et al. 799). What is new is the notion that results could vary so much across different societies, and that market integration of each society could explain a significant portion of that variation.

Market integration, as formulated by Henrich et al., reflects the frequency and importance of contact with strangers. Societies organized in semi-autarkic households, with scant need to interact with strangers might therefore exhibit little prosocial behavior when interacting with the anonymous other of a game (Henrich et al. 2004: 40). Likewise, cooperation with non-kin would be low in societies with semi-autarkic households, since the household can furnish most of its own needs. From this perspective, prosocial behavior would be emphasized in societies where persons come in frequent contact with others, requiring that contact in order to gain their livelihood. For example, the society with the most prosocial behavior in the Henrich et al. sample (the Lamalera) engages in whale hunting, which requires that men work together in boat crews, dividing the catch (Henrich et al. 2004: 39).

Similar work has been done comparing game behavior across modern nation states. While the results of "basic games" such as the ultimatum game show little variation across nations, variation is quite pronounced in games that allow "norm enforcement" (i.e., punishment) (Gächter et al. 2005). Hermann et al. (2008) conducted games with university students in 16 cities across 15 countries. They used a *public goods game*, in which four participants are each given 20 tokens, redeemable for money. Each participant can put tokens in a common fund, which the experimenter increases by 1.6 and then redistributes equally among all participants. If each player puts in her entire endowment, she will receive 32 tokens at the end of the game. Nevertheless, if she keeps her 20 tokens and the other players each put in 20 tokens, then she will do even better, receiving 24 tokens from the common fund, giving her a total of 44 tokens. On the other hand, if she is the only one to contribute, and she contributes her entire endowment, then she will lose heavily, ending the game with only eight tokens. From the traditional economic perspective of rationality, players should anticipate that other players will not contribute and therefore not contribute themselves.

Generally, public goods games are played for multiple rounds. Contrary to the predictions of standard economic theory, the average contribution to the common fund will start out high; eventually, however, contributions fall to very low levels. But if players are allowed to "punish" each other, then typically those who fail to contribute are punished by high contributors and will subsequently also contribute, so that the game ends with all players contributing their full endowment. "Punishment," in the Hermann et al. games, consists of a three token fine, but the player who initiated the punishment must pay one token as a cost. The Hermann et al. study examined the fact that punishment not only takes on prosocial forms (punishing those who failed to contribute) but also anti-social forms (usually revenge attacks on high contributors by those who had been punished). Nations with stronger traditions of rule of law had much less anti-social punishment (Hermann et al. 2008: 1366). Herbert Gintis (2008: 1346) considers the most likely reason for this to be that societies with well-developed rule of law are those in which people often interact with strangers, and who therefore react to punishment by strangers with guilt and correct their own behavior. On the other hand, those societies with weaker rule of law are those in which people primarily cooperate with family and friends, and are likely to respond with anger to punishment by strangers.

Using both ethnographic and international samples, empirical studies have attempted to uncover the determinants of prosocial behavior in economic games. In all cases, the most prosocial behavior is seen in players from societies in which people are accustomed to interact with strangers. Since markets are the primary means through which strangers voluntarily interact, this suggests that market relationships encourage prosocial behavior.

This paper will examine the extent to which markets are associated with prosocial behavior, using the Standard Cross-Cultural Sample (SCCS), a database containing variables for 186 well-documented societies. The advantage of the SCCS is that it contains well-studied societies from the entire range of human experience: from foragers to advanced civilizations, from the Arctic to the tropics, sampled from every major cultural region of the world. Only by testing against such a complete sample can one make generalizations claiming to encompass all of humanity (Ember and Ember 2000).

The paper is divided into five parts. First, a brief review of some of the literature on determinants of prosocial behavior. Next, a description of the variables selected from the SCCS. Following that, a discussion of three major econometric issues encountered when estimating models with data from the

SCCS. The fourth section describes the estimation and the results. The fifth section consists of a discussion of our findings.

II. The determinants of prosocial behavior

Henrich et al. (2005: 814) note that their experimental outcomes could either be the expression of behavioral rules cued by the context of the game or the expression of "generalized behavioral dispositions." For the former, they offer a few examples: the Orma interpreted the public goods game as similar to a funding practice called *harambee* used to build schools or roads, and contributed generously; the Au interpreted the ultimatum game as similar to gift-giving by powerful men, where recipients fall under an onerous obligation to repay, and therefore rejected generous offers (Henrich et al. 2005: 811). These are instances of behavior explicitly cued by *specific* norms. On the other hand, some societies may try harder to inculcate prosocial behavior, and the variation in game results could be due to these generalized dispositions.

Socialization research (Henrich et al. 2005: 813; Ross 1992; Whiting 1965; Whiting and Whiting 1975; Broude 1990) has documented how different child-rearing practices can lead to different levels of prosocial behavior. Cross-cultural methods have established that different kinds of values are instilled in different kinds of subsistence economies (Barry et al. 1959; Barry et al. 1976). For example, obedience and responsibility are valuable in pastoral or agricultural societies, where children must learn to care for stocks of food; self-reliance is valuable in forager societies, where children must learn to roam about and gather food (Barry et al. 1959). Generalized prosocial behavior would tend to be established in a society where members would find it useful. As discussed below, agents in a market economy have an incentive to display generalized prosocial behavior.

Evolutionary theory suggests a partitioning of sociality into three forms: nepotism, reciprocity, and coercion (van den Berghe 1981). The first two represent the two theoretical perspectives that can explain the existence of cooperation: cooperation that benefits consanguineal kin (Hamilton 1964), and cooperation to non-kin that is paid back in future benefits (Trivers 1971). Coercion encompasses non-cooperative behavior. These three forms are conceived as ideal types, since any specific social structure will embody all three forms, though one might predominate. For example, the nuclear family includes elements of coercion (parents coerce children) and reciprocity (the parents are not close consanguineal kin), though nepotism predominates.

A society in which reciprocity is particularly predominant, relative to nepotism and coercion, will be one in which prosocial behavior is particularly useful. Coercive relationships require only that subjects be obedient, not honest, trustworthy, or generous, so the need for prosocial behavior is low in a society characterized by hierarchy and force. Nepotistic relationships require that subjects discriminate in favor of close consanguineal kin, and do not require generalized prosocial behavior. Prosocial behavior is especially useful whenever non-kin freely enter into cooperative activities.

Reciprocity, as used here, embraces any exchange in which the partners are not consanguineal kin, and are not strictly bound by formal rules or authority to perform the exchange. Voluntary exchange in a market would meet these criteria, as would freely entered-into cooperative behavior.[3] Reciprocal relationships usually entail a prisoner's dilemma problem: the agents collectively benefit most from cooperation, but individually benefit most from cheating. Since the best strategy for an agent faced with a cheating partner is also to cheat, one would expect both agents to cheat in the absence of trust.

Explaining the existence of human reciprocal relationships has therefore become an interesting theoretical problem for biologists and social scientists. One of the first important theoretical advances came in 1981, when the political scientist Robert Axelrod and the evolutionary biologist William Hamilton showed that the optimal solution to a repeated, two-agent prisoners' dilemma game was tit-for-tat: start out cooperating, then on each subsequent move simply repeat what the other party did on the previous move (Axelrod and Hamilton 1981).

Tit-for-tat, however, is unable to explain cooperative behavior in cases where multiple agents interact, or where interactions with a particular agent are not repeated. Richard Alexander (1987: 85) developed the concept of "indirect reciprocity" to explain situations where humans behave altruistically, even though there is a near-zero chance of further interactions (e.g., the tipping of a waiter at a restaurant that one will not visit again). Here, the altruistic act is for display, to inspire trust in potential partners. A large number of models subsequently emerged in which the agents cultivate "reputations" which determine the quality of their interactions with others (for example, Nowak and Sigmund 1998; Gintis et al. 2001; Panchanathan and Boyd 2003; Ohtsuki and Iwasa 2006; Pacheco et al. 2006; Bereczkei et al. 2007).

Over two centuries ago[4] Adam Smith (1978: 538-539) made the argument that agents engage in prosocial behavior in order to build reputations that inspire trust; receiving benefits from that trust through improved access to reciprocal relationships. Specifically, he argues that *market relationships* promote honesty, because honesty builds trust, and trust brings customers:

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[3] This definition of reciprocity therefore potentially encompasses much of both *reciprocity* and *markets* in Karl Polanyi's influential schema (Polanyi 1957).

[4] Smith's *Lectures in Jurisprudence* are based on notes by students attending his lectures at Glasgow University, between 1752 and 1764 (Smith 1978: 2).

> "Whenever commerce is introduced into any country, probity and punctuality always accompany it. … Of all the nations in Europe, the Dutch, the most commercial, are the most faithfull to their word. The English are more so than the Scotch, but much inferiour to the Dutch, and in the remote parts of this country they are far less so than in the commercial parts of it. This is not at all to be imputed to national character… It is far more reduceable to self interest… A dealer is afraid of losing his character, and is scrupulous in observing every engagement. When a person makes perhaps 20 contracts in a day, he cannot gain so much by endeavouring to impose on his neighbours, as the very appearance of a cheat would make him lose. Where people seldom deal with one another, we find that they are somewhat disposed to cheat, because they can gain more by a smart trick than they can lose by the injury which it does their character… When the greater part of people are merchants they always bring probity and punctuality into fashion, and these therefore are the principal virtues of a commercial nation."

Morton Deutsch (1962) maintains that the following four conditions are sufficient to create trust in experimental games: the participants can work out a system of procedures; the participants both have control over outcomes; the participants know each other; and there is the possibility of involving a third party to resolve disputes (Erasmus 1977: 50). The first two of these conditions require that parties to an exchange can work out the rules themselves, and that they retain control of the exchange, so that exchange is both decentralized and voluntary. One can see that these conditions would be more pervasive in a society with a long-established tradition of liberty and egalitarianism, and that market transactions can meet these two conditions. The third condition—that the parties know each other—involves the cultivation of reputation, as in the models based on indirect reciprocity.

The final condition—that third parties can be involved as arbiters—is implicit in Adam Smith's recognition that a market economy needs an impartial court system to enforce contracts (e.g., Smith 1937: 576), and in Mancur Olson's (1965) idea that "selective incentives" can force free riders to contribute to public goods. Contemporary research (e.g., Boyd and Richerson 1992; Fowler 2005; Shinada and Yamagishi 2007; Boyd and Matthew 2007; Hauert et al. 2007; Gintis 2007) recognizes that punishment for uncooperative behavior maintains cooperation, as discussed above in the context of the public goods game. Even among nonhuman primates, such as chimpanzees and capuchin monkeys, experiments have shown that actors are willing to punish others when outcomes are unfair (Silk 2007; Brosnan and de Waal 2005). Thus successful reciprocity requires some coercion.

Coercion can therefore support reciprocity, insofar as it punishes uncooperative behavior. Group selection models consider coercion aimed at out-groups, and conclude that *external* war should promote prosocial behavior (Choi and Bowles 2007). Thus coercion both in the form of sanctions against uncooperative behavior and in the form of external war should promote prosociality. On the other hand, socialization studies find prosocial behavior to be incompatible with a male ideal of aggressive toughness (Ross 1992: 278); warfare would be particularly likely to call forth this male ideal, so war could lower prosocial behavior.

III. Data

The Standard Cross-Cultural Sample (SCCS) contains 186 cultures, each selected as a relatively well-documented representative of a local cultural region (Murdock and White 1969). Over time, scholars have combed the ethnographies for these 186 cultures, coding about 2,000 variables for a wide variety of cultural traits. The SCCS descriptions of the variables selected are presented in Appendix B, and the descriptive statistics are presented in Table 1a.

Three variables, coded by Barry et al. (1976), measure the degree to which a society, during the process of childhood socialization, inculcates generosity, trust, and honesty. These prosocial traits will serve as dependent variables. They are described in greater detail in Appendix A. Figures 1-3 show the geographic distribution of values for these three variables.

Our hypothesis is that prosocial traits are most likely to be inculcated in societies where non-kin engage in voluntary exchanges, whether these are part of a web of ongoing cooperation, or sharply delimited one-time market exchanges. Three independent variables measure the intensity of market exchange. Two variables measure the extent of cooperation. Two other variables give some sense of the rules governing the inheritance of property.

Societies in which coercive relationships predominate will have less need for prosocial behavior, and we include one variable to measure the degree of coercion from political authorities within the society. We also include one variable for internal war, one for external war, and one to indicate the number of neighboring societies. Likewise, societies where nepotistic relationships predominate will have less need for general prosocial behavior, and we employ three variables to measure the degree of nepotism.

To avoid omitted variable bias, one must control for other likely determinants of prosocial behavior. One consideration would be the costs of prosocial behavior: prosocial behavior would be more costly in a society experiencing scarcity and hence less likely to be observed. Two variables reflect the scarcity of food, and two others reflect the difficulty of obtaining a spouse. Since religion plays a role in most moral systems, a variable is included indicating that gods actively support human morality.

Finally, since variation in the degree to which a society tries to instill prosocial behavior may simply be due to variation in the degree to which a society pays attention to children, we include a variable for the value a society places on children.

IV. Estimation issues for SCCS data

1. Galton's problem

Since 1889, cross-cultural researchers have been aware of an estimation problem peculiar to cross-cultural work. In his comments on Edward Tylor's study of the relationship between pairs of cultural traits, the statistician Sir Francis Galton pointed out that Tylor's results were inconclusive: the "associations" (we would now say correlations) between pairs of traits across cultures could be due to functional relationships, but they could also be due to relationships among the cultures based on common descent or cultural borrowing (Stocking 1968: 175).

In a regression model, Galton's problem is the problem of spatially autocorrelated errors, where cultures that share characteristics due to common descent or physical proximity have similar values of the error term. The standard errors of the estimated coefficients will be biased, but the model is also misspecified since there are omitted variables (variables showing the influences from nearest neighbors), so the estimated coefficients will also be biased.

Testing for spatial autocorrelation requires the use of a spatial weights matrix. Language phylogeny matrices have been used for relationships of descent, and geographical distance matrices have been used for relationships of borrowing. Incorporating the effects of spatial dependence can be done either with a spatial error model or a spatial lag model (Dow et al. 1984; Dow 1984; Dow 2007). Our approach here is to use a spatial lag model:

$$y = X\beta + \lambda_L W_L y + \lambda_D W_D y + \varepsilon \qquad (1)$$

Where y is an *nx1* vector representing our dependent variable, **X** is an *nxk* matrix representing the independent variables, β is a *kx1* vector of coefficients, W_L and W_D are weight matrices, for language and distance respectively, λ_L and λ_D are scalar coefficients, and ε is a vector of errors. The scalars λ_L and λ_D are the spatial lag parameters, allowing an estimate of the effects of common descent or cultural borrowing on y.

The spatial lags $y_L=W_L y$ and $y_D=W_D y$ are endogenous, since by definition they will be correlated with the error term ε. Two-stage least squares is the simplest way to estimate this model (Dow 2007). In the first stage, estimate y_L and y_D, using as instruments the spatial lag of the original independent variables (X) as well as the spatial lag of any other exogenous variables (Z):[5]

$$\hat{y}_L = W_L X\hat{\pi} + W_L Z\hat{\gamma} \tag{2a}$$

$$\hat{y}_D = W_D X\hat{\pi} + W_D Z\hat{\gamma} \tag{2b}$$

Then substitute these into equation 1:

$$y = X\beta + \lambda_L \hat{y}_L + \lambda_D \hat{y}_D + \varepsilon \tag{3}$$

While for some studies other spatial lags can be introduced (for example, ecological conditions, subsistence type, cultural complexity) the classic Galton's problem requires only spatial lags for language and distance.

2. Multiple Imputation

The usual procedure for handling missing data is *listwise deletion*. In a regression model of the form $Y=\mathbf{X}\beta$, one drops any row where data are missing in Y or in one of the columns of $\mathbf{X}$. However, this method forgoes the information present in the dropped observations, which in turn has the potential to cause sample selection bias, so that the estimated coefficients are misleading. An alternative is *multiple imputation*, which uses Bayesian methods to impute values for the missing observations. This method is appropriate when the extant data provide information that can be used to predict the missing data.

King et al. (2001: 50-51) provide an intuitive presentation of the circumstances in which multiple imputation is appropriate. Consider the data matrix $\mathbf{D}=\{Y,\mathbf{X}\}$. Some elements of $\mathbf{D}$ are missing ($\mathbf{D}_{miss}$) and others are observed ($\mathbf{D}_{obs}$), so that $\mathbf{D}=\{\mathbf{D}_{miss}, \mathbf{D}_{obs}\}$. Think of matrix $\mathbf{M}$ as a "missingness indicator matrix" for $\mathbf{D}$, where cells take the value of "1" when the corresponding cell in D is observed, and the value of "0" when the cell in D is missing. Missing data can be divided into three types:

1. *Missing completely at random* (MCAR). The variable with missing values is uncorrelated with other variables, so that a missing value cannot be imputed. A good example of a variable whose missing values are missing completely at random would be the results of a coin toss. $\mathbf{M}$ is not conditioned by $\mathbf{D}$: $P(\mathbf{M}|\mathbf{D})=P(\mathbf{M})$.

2. *Missing at random* (MAR). The variable with missing values is correlated with other variables, *and* the values which happen to be missing are random (once controlled for by the other

[5] In our estimations, additional exogenous variables included: dummies for subsistence type, descent system, type of settlement, political leadership; variables for climate, soil, and population density; and variables for socialization style.

variables). In this case, a missing value can be imputed using the observed data: P(**M**|**D**)=P(**M**|$\mathbf{D}_{obs}$).

3. *Nonignorable* (NI) The probability that a cell is missing is a function of the missing value itself. That is, not just the observed values, but the missing values are needed to estimate the probability that a cell is missing: P(**M**|**D**)=P(**M**| **D**). Here, missing values cannot be imputed.

It is only the second situation that permits imputation. In practice, though, one can usually bring in additional data ($\mathbf{D}_{obs}$) so that cases classified as NI become MAR and therefore imputable.

Listwise deletion produces inefficient estimates, which are also biased unless MCAR prevails. Multiple imputation provides estimates that are efficient and unbiased under both MCAR and MAR. Under NI, both listwise deletion and multiple imputation produce biased estimates. In general, then, multiple imputation should produce estimates that are more efficient and have less bias than estimates produced using listwise deletion (King et al. 2001: 50-51).

Multiple imputation uses iterated estimation methods to estimate missing values based on all extant values, in each round substituting newly estimated values for the missing values. Gibbs sampling is used to take *m* random draws from the probability distribution for the missing values, conditional on the variables used to estimate them. One then has *m* (typically 5 to 10) duplicates of the original data set, each with different values imputed for the missing data.

The equation Y=$\mathbf{X}\beta$ is estimated once for each of the *m* imputed data sets. This gives *m* estimates of the parameters β and their associated variances. These estimates are then combined to give the final estimate of the parameters β_i and their variances, as shown in Rubin (1986: 76-77).

The final estimate of each parameter β_i is simply the mean of the *m* estimates:

$$\overline{\beta}_i = \sum_{j=1}^{m} \hat{\beta}_{i,j} \Big/ m \tag{4}$$

To calculate the variances, one must consider both the *m* estimated variances, *and* the variation in the estimated parameters β_i across the *m* estimations. First, the mean of the *m* estimated variances for each parameter *i*:

$$\overline{U}_i = \sum_{j=1}^{m} \hat{u}_{i,j} \Big/ m \tag{5}$$

Then, the variance in the *m* estimated values of β_i:

$$B_i = \sum_{j=1}^{m} \left(\hat{\beta}_{i,j} - \overline{\beta}_i\right)^2 \Big/ (m-1) \tag{6}$$

These are then combined to get the total variance in β_i:

$$T_i = \overline{U}_i + (1 + m^{-1})\, B_i \tag{7}$$

The following relationship then gives the p-value for the null hypothesis that the true value of β_i equals β_0.

$$\Pr ob\left(F_{1,v} \leq \frac{\left(\beta_0 - \overline{\beta}_i\right)^2}{T_i} \right) \tag{8}$$

where the denominator degree of freedom v_i is given by

$$v_i = (m-1)(1 + r_i^{-1})^2 \tag{9}$$

and r_i is given by

$$r_i = (1 + m^{-1})\, {B_i}\big/{\overline{U}_i} \tag{10}$$

The fraction of missing information, for each regression parameter, is

$$\gamma_i = \frac{\left(r_i + \frac{2}{v_i + 3} \right)}{r_i + 1} \tag{11}$$

Test statistics produced for each of the m estimations can also be combined to produce a final statistic, as shown in Rubin (1986: 78-81). If $d_1, \ldots, d_m$ are test statistics produced in the m estimations, distributed χ^2 with k degrees of freedom,[6] then they can be combined as follows:

$$\hat{D}_m = \frac{\frac{\overline{d}_m}{k} - \frac{m-1}{m+1} r_m}{1 + r_m}, \text{ where } \overline{d}_m = \sum_{j=1}^{m} d_j \Big/ m \tag{12}$$

$\hat{D}_m$ is distributed F, with k and $(k+1)v/2$ degrees of freedom. Finding v requires a different method of estimating r:

[6] If the initial test statistics d_j are distributed F, they can be converted to χ^2 by finding the p-value of the F-statistic (with k and f degrees of freedom) and then finding the χ^2 statistic with k degrees of freedom that has the same p-value (Rubin 1986: 79).

$$\hat{r}_m = \frac{\left(1 + m^{-1}\right)s_d^2}{2\bar{d}_m + \left[4\bar{d}_m^2 - 2ks_d^2\right]_+^{1/2}}, \text{ where } s_d^2 = \sum_{j=1}^{m}\left(d_j - \bar{d}_m\right)^2 \Big/ \left(m-1\right) \tag{13}$$

The plus sign on the bottom right of the square bracket indicates that the expression within the bracket is set to zero when it is negative.

We employed the procedures developed by Joseph L. Schafer (1997, 2007) to calculate *m*=50 multiply imputed sets of data. In Table 1a, the column labeled *mnSDm* measures variation of the variable over the *m* imputed data sets: for each of the 186 societies, the standard deviation of the variable is calculated over the *m* data sets; the table reports the mean of the 186 standard deviations for each variable. Those variables with more missing values clearly vary more across the *m* data sets; variation is especially high for two of the dependent variables (*gener* and *honest*), as well as two of the market variables (*markin* and *markout*) and the two property variables (*commland* and *sharefood*), suggesting that it may be difficult to get good fits with these variables.

One consideration when using multiple imputation with the SCCS is that the imputed data preserve the spatial structure of the original data—that is, the imputed data should exhibit Galton's problem in the same way as the original data. To test this we calculated Moran's I (Getis and Ord 1992) for each variable in the original data and then in each of the 50 imputed data sets, using only physical distance, not language. Using Equations 12 and 13 above, we combined the Moran's I results from the imputed data sets. Table 1b presents the p-values for each variable, for the null hypothesis that there is no spatial autocorrelation. The first column shows the p-values for the original data, and the second column the p-values from the combined multiply imputed data sets. Reassuringly, the spatial structure of the original data appears to be preserved in the imputed data.

3. Causation in cross-cultural data

Examining functional relationships in cross-cultural data raises two kinds of issues related to causation: endogeneity and the distinction between proximate and distal causes. Strictly speaking, functional relationships are teleological, and not relationships of efficient cause. Insofar as it is possible to speak of causation in a functional relationship it is mutual causation that is implied. In the econometric setting, such mutual causation leads to the problem of endogeneity, which implies that the estimated regression coefficients will be biased. Nevertheless, there are theoretical reasons to think that some cultural features have a kind of causal primacy over other cultural features. Specifically, a *cultural materialist* perspective suggests that a society's environment and technology condition its social organization, which conditions its ideology. A materialist perspective gives a theoretical reason to think that the problem of endogeneity can be avoided: if the dependent variable is a feature of ideology, and the independent variables are features of the environment, technology, or social organization, then none of the independent variables should be endogenous.

The distinction between proximate and distal causes is seldom discussed in cross-cultural work, but it is potentially important. Socialization practices such as father-absence have long been known to influence the inculcation of prosocial traits. These are proximate causes, directly responsible for the appearance of prosocial behavior. But behind these are more distal causes, such as the existence of chronic warfare, which provide the prosocial behavior with its functional rationale. The layers of causation are unlike those in a traditional econometric setting, where the layering is ordered temporally (more recent phenomena are caused by older phenomena), but are rather organized in terms of immediacy, such that efficient causes are proximate and final causes are distal, with gradations between. From an evolutionary perspective, the most distal cause is the fitness of the gene-complex responsible for a behavior. The distal causes in cross-cultural data lie in the middle-ground.

The key issue for model specification is that variation in the dependent variable will be captured by both the proximate and distal causes, leading to a problem of multicollinearity. Since both proximate and distal causes are part of the same process, one should avoid including independent variables representing different layers of causation. In the present study, we are interested in the effects of markets on prosocial behavior, and we therefore avoid introducing independent variables for socialization practices (such as father-absence) that are more proximate causes of the behavior.

V. Estimation and Results

Tables 2 through 5 present the estimation results for four different two-stage least squares models, where lag variables (for distance and language effects) are first estimated, and the fitted values from this first stage are used as "instruments" (i.e., replacements for endogenous independent variables) in the second stage. The first three models are for the dependent variables generosity, honesty, and trust, respectively. The fourth model has trust as the dependent variable, but includes instruments for generosity and honesty among the independent variables. All variables were first standardized, so that the coefficients can be interpreted as the number of standard deviations the dependent variable will change for a one standard deviation increase in the independent variable. For all models an unrestricted model was estimated across 50 imputed data sets, and the p-values from the unrestricted model were used to rank the variables. Independent variables were then dropped, beginning with the variables with the highest p-values, until an F-test on the restrictions attained a p-value below 0.05. The last variable dropped was then reintroduced into the final model.

Listwise deletion would have left us with between 26 and 30 observations in our four unrestricted models; since these models estimated 20 parameters, the degrees of freedom would have been unacceptably low, and there would have almost certainly been a problem of sample selection bias in the particular societies deleted. Multiple imputation therefore offered the opportunity to estimate a model over the full range of societies, with a large number of independent variables.

A number of diagnostic tests are conducted for each of the restricted models. A RESET test (Ramsey 1969) has the null hypothesis that the model's functional form is adequate. A LaGrangian multiplier test for heteroskedasticity (Breusch and Pagan 1979) has the null hypothesis that the regression residuals are homoskedastic. The LaGrangian multiplier tests for spatial error and spatial lag effects, using the two weight matrices (language and distance), under the null hypothesis that there are no spatial effects (Anselin 1988). Finally, the Variance Inflation Factor (VIF) is calculated for each variable in each model to examine the extent to which multicollinearity is present (Greene 2003: 57). The VIFs and the R^2 reported in the tables are the mean values from the 50 imputed data sets.

Table 2 reports the estimation results for a model with generosity as the dependent variable. The table is divided into two parts. The first part (Table 2a) reports the coefficients and p-values for the unrestricted and restricted models. To provide some intuitive understanding of how the results differ across the *m* data sets, the table shows, for each model, the percentage of the 50 estimations that have a coefficient of the same sign as the estimated coefficient. All of the cooperation and property variables enter the restricted model as does one of the market variables.

The second part of Table 2 (Table 2b) reports the final restricted model. The diagnostics indicate no problems with heteroskedasticity, autocorrelation, or misspecification. Five of the independent variables are insignificant, even though an F-test rejects adding any of these insignificant variables to the list of variables already dropped. Usually such a situation indicates multicollinearity, but that is not the case here, since all of the VIFs are low. The variables are sorted by ascending size of coefficient (these are standardized so that they can be directly compared to each other). The surprise here is that the two property variables (*inhreal* and *inhmove*) are negative and significant, suggesting that rules of property inheritance discourage generosity. Norms of food sharing, on the other hand, promote the inculcation of generosity, as does the presence of external markets. Of the other variables entered into the model as controls, the positive coefficient for exogamy is the most interesting; indicating that as nepotistic ties become less salient, generosity is more encouraged. As expected, scarcity (*foodscarc*) discourages generosity.

Table 3 contains the results for a model with *honest* as the dependent variable. The two property variables, one of the cooperation variables, but none of the market variables, enter the restricted model. Again, the final restricted model passes all of the diagnostic tests, but many of the coefficients are insignificant, despite the F-test indicating that these variables should remain in the model. Only one property variable is significant (*inhreal*) in the restricted model, and this is negative, suggesting that rules of inheritance of real property discourage honesty. Of the control variables, exogamy is again positive and significant. And, similar to the case with generosity, scarcity (*polygamy*) discourages honesty.

A model with *trust* as the dependent variable is presented in Table 4. The diagnostic tests show no problem with heteroskedasticity, autocorrelation, or specification. Two of the market variables (*markin* and *money*), one of the property variables (*inhreal*) and one cooperation variable (*sharefood*) emerge from the unrestricted model, but only *inhreal* is significant in the final restricted model. Once again, the results suggest that prosocial behavior is less encouraged in societies with rules for the inheritance of real property. The most interesting of the control variables is *nsoc150*, which has a negative coefficient, indicating that trust is less pronounced in societies that have a large number of neighboring societies. Unlike the previous models, the spatial lag (based on physical distance) is significant, which indicates that trust may diffuse among neighboring societies.

The fourth model, presented in Table 5, again has trust as the dependent variable, but includes instruments for generosity and honesty as independent variables. As one would expect, both of these are positive and highly significant, suggesting that trust is higher where honesty and generosity are higher. Two of the market variables (*money* and *markin)* pass to the restricted model. Both of these are negative and significant, which is contrary to our initial expectations. The control variable *nsoc150* again has a negative and significant coefficient, showing that the presence of strangers from *outside* one's own society diminishes trust. Again, the diagnostic tests show no problems with the restricted model.

Table 6 summarizes the signs on the estimated coefficients in the four models. The sign of the unrestricted coefficient is shown, with the sign of the coefficient in the restricted model in parentheses, when that coefficient is significant. Our initial expectation that markets would tend to encourage prosocial behavior is not borne out by the results. The only exception appears to be for the trait of generosity, where the presence of external markets is associated with greater inculcation of generosity.

Our variables for cooperation return mixed results. Sharing of food is associated with greater inculcation of generosity, while communality of land is never significant, and never takes on the expected positive sign even in the unrestricted model. The results for our property variables are unambiguously contrary to expectation: societies with clear rules of property inheritance are less likely to instill prosocial behavior in children.

VI. Discussion

The results failed to confirm our initial expectation that generalized prosocial behavior will be more pronounced in societies where reciprocity is more important, especially reciprocity embodied in market relationships. There are several possible reasons for this negative result.

The first pertains to the nature of our dependent variables. Rather than measuring the extent to which prosocial behavior is observed among adults, the variables measure the extent to which adults attempt to inculcate the behavior in children. Since children learn by example, as well as explicit instruction, it could be that societies with plentiful good examples (i.e., adults tend to behave prosocially) would not need to make much effort to inculcate prosociality in children, and hence would rate low on the values of our dependent variables.

The second is that our prosocial behaviors, and especially generosity, do not always act so as to build reputations in support of reciprocity, and indeed cannot always be considered "prosocial." Among the Kwakiutl, generosity may serve to display status of leaders (Bliege-Bird and Smith 2005: 227); among the Au and Gnau of Papau New Guinea, ambitious men seek status by giving expensive gifts that create often unwelcome obligations in the recipients (Henrich et al. 2004: 39); among the Meriam of Queensland, generosity during funeral feasts signals "lineage strength" (Bliege-Bird and Smith 2005: 227). For Aristotle, who maintained that property should be privately held but used in common (Aristotle 1946: 49), generosity was the enabling virtue, and was in typical Aristotelian fashion defined as a middle-path behavior between miserliness and wastefulness (Aristotle 1985: 88). Here generosity is part of the ethic of *noblesse oblige*, and elite expenditure becomes community consumption, as it does in the "corporate communities" described by Eric Wolf (1955: 458). In all of these cases, rather than signaling one's suitability as a partner in a reciprocal exchange relationship, generosity signals and builds status, creating "invidious distinctions," to use the language of Thorstein Veblen (1953).

The third consideration is the possibility that general prosocial dispositions have little to do with the ethnographic experimental game outcomes discussed above, and that those outcomes are entirely due to the cuing of culturally specific norms. But this begs the question: how is it that specific norms were cued such that the size of offers in ultimatum games correlated with levels of market integration? There must be some way in which norms are systematically affected by markets. One possibility is that markets, or rather capitalism, leads to a weakening of shared norms.

One experiment by Carolyn Lesorogol explicitly looked at the effect of shared norms. In some of her experiments, proposers were encouraged to contextualize the dictator game by thinking of it as the sharing of goat meat. Framing the game in this way led proposers to make significantly *lower* offers than they did in a much more abstract game. Lesorogol (2007: 921) points out that shared norms make the behavior of other agents predictable and, as Charles Erasmus (1977: 49) notes, trust is based upon predictability. A likely interpretation of Lesorogol's results is that the shared norms gave the proposer confidence that her offer would be acceptable to the responder, whereas in the abstract game, the proposer felt compelled to make higher offers in order to avoid offending the responder.[7] In other words, the absence of a shared norm gives rise to a kind of risk premium in the initial offer, so that initial offers become higher.

As Georg Simmel (1978) has described, capitalism erodes traditions: pecuniary valuation displaces traditional ways of valuation; relationships among persons become instrumental and restricted within the bounds of a contract, rather than ongoing whole-person relationships. Capitalism creates a world in which people and things are commodified, so that one person or thing is much like another, where all people are strangers and strangers really aren't that strange. Capitalism creates a much more *abstract* world, in which general notions of fairness in exchange (modeled on bargaining among equals in a market) replace specific cultural norms mediating exchanges among actors occupying specific roles. Friedrich Hayek (1976: 109), in fact, argues that capitalism is simply an efficient means, allowing the coexistence of persons with very different ends, so that in the resulting pluralistic society there are no norms shared by all persons. Thus, players from capitalist societies may not only be primed to treat strangers with relative sympathy, they may also have few shared norms available to guide offers and responses other than the norm of fair exchange in a market.

In this view, if specific shared norms are guiding offers and responses in experimental games, and those norms are different from one society to another (which is quite likely to be the case), then one would observe wide variation in offers and responses—which in fact *is* what one observes. Further, to the extent that a society has been affected by capitalism, shared norms will be weakened, leading to offers that are somewhat high since there is a greater probability of offending the responder without a shared norm.

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[7] This was a dictator game, so the responder could not reject the proposer's offer. The responders and proposers were kept in separate areas, without contact, and were randomly called to participate in the anonymous game (Lesorogol 2007: 923). Nevertheless, all players were from the same ethny and the same community, and proposers may have had the sense that they were playing with members of their in-group. Proposers may have also expected gossip to spread of their winnings. Unfortunately, the experimenters were unable to conduct post-game interviews for the abstract game, so we lack proposers' own testimony on why they made such high offers (Lesorogol 2007: 924).

Viewed in this way, there is no reason to expect members of societies with economies integrated by markets to have any greater tendency toward generalized prosocial behavior than members of societies without markets.

VII. Summary and Conclusions

A number of ethnographers have conducted experimental games among the people they study. The results have attracted a great deal of interest, for several reasons. First, they show a great deal more variation in game results than one sees in the large number of studies conducted among university students in industrialized nations. Second, ultimatum game offers in many of the studied societies are more "rational" (i.e., less generous) than one sees in industrialized societies. Third, variation in game results cannot be explained by individual-level demographic data, but much can explained by society-level variables, with the striking discovery that more generous offers in ultimatum games are made in societies with higher levels of market integration.

The question remains whether the generous offers were made because of generalized prosocial dispositions, or because the offers were cued by specific shared norms. If the former, then it appears that societies with economies integrated by markets may socialize children to display high levels of generalized prosocial behavior. There are strong theoretical reasons to believe in such an association, beginning with ideas from Adam Smith, and continuing through the work of contemporary game theory in evolutionary biology and social science. These perspectives argue that prosocial behavior helps to build an actor's reputation, with the goal of gaining the trust of other actors, so that they are willing to engage in cooperative activities.

This paper attempted to test the association between generalized prosocial behavior and markets, using the Standard Cross-Cultural Sample of 186 societies representing the full spectrum of human diversity. Since many of the variables have missing values, we used multiple imputation, in order to retain the full diversity of societies with the SCCS. Galton's problem is widely recognized as the single most critical problem of cross-cultural research; we employed the spatial econometric methods presented in Dow (2007) to correct for Galton's problem. The dependent variables in our models represent the degree to which a society attempts to inculcate the values of generosity, trust, and honesty during socialization. The independent variables include several variables pertaining to markets (the existence of internal markets; the existence of external markets; the existence of true money) as well as two variables on the existence of assignable property rights, and 14 control variables.

The results of our models give no support to the notion that societies with markets are more likely to inculcate prosocial values in their children. We interpret this negative result as implying that societies with market-organized economies are no more likely to instill high levels of prosociality in their members than are any other kind of society, and that the results of the ethnographic experiments can most likely be interpreted as due to the cuing of shared norms. We explain the fact that ultimatum game offers are higher in societies with higher levels of market integration by pointing to the writings of Georg Simmel and Friedrich Hayek, who show that capitalism leads to the erosion of shared norms. The relative lack of shared norms reduces the predictability of a responder's reaction in an ultimatum game, and therefore causes the proposer to make a higher offer in order to insure against rejection.

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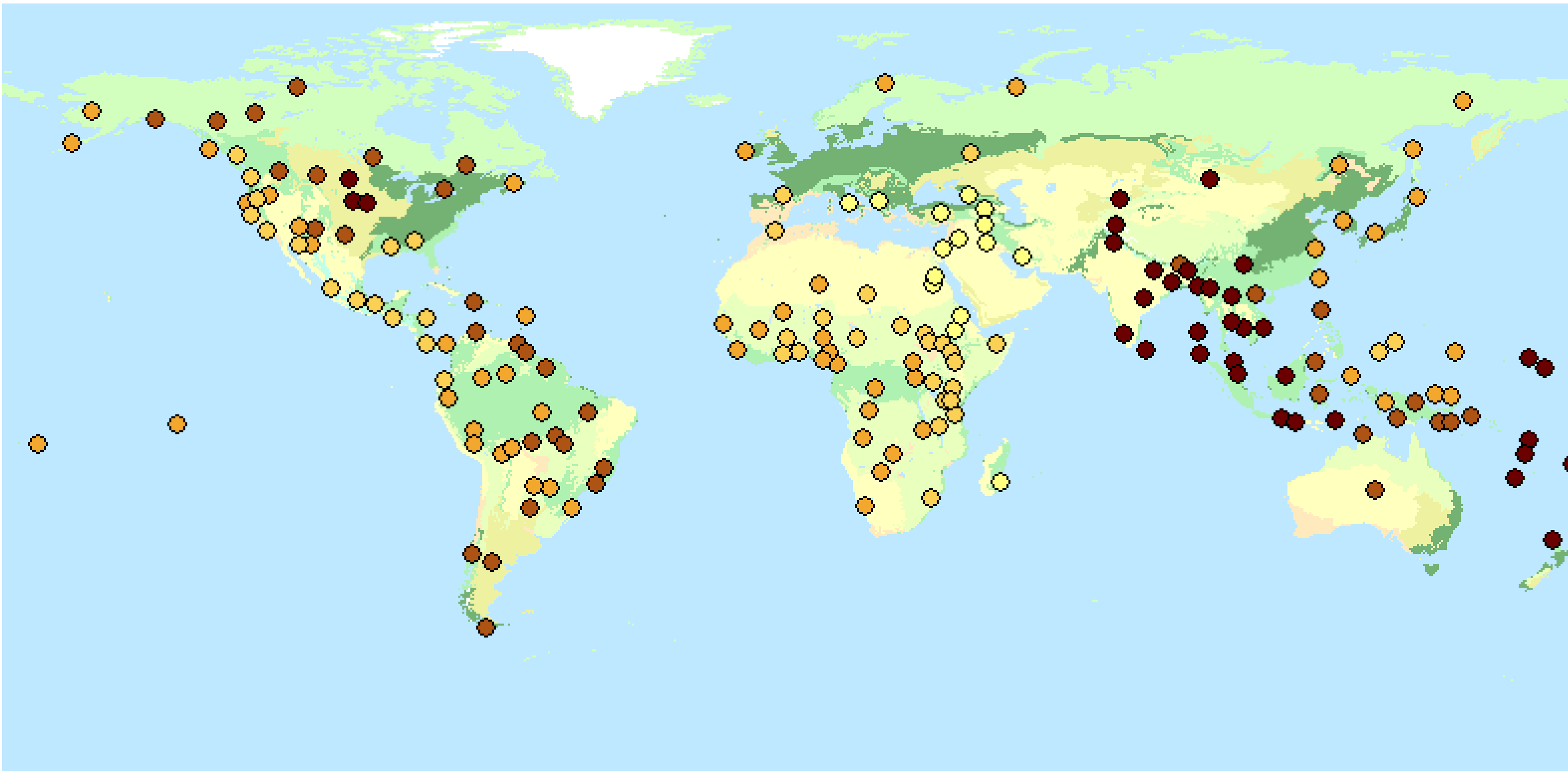

Figure 1: Trust. Trust is the most spatially autocorrelated of the three dependent variables (see Table 1b). This map presents the local-G* values, using the 10 nearest neighbors, based on the mean of the 50 multiple imputation values. Values are therefore smoothed, and are informative of the existence of local clusters, rather than the values of specific societies. Darker colors represent higher levels of the variable trust; lighter colors are lower levels.

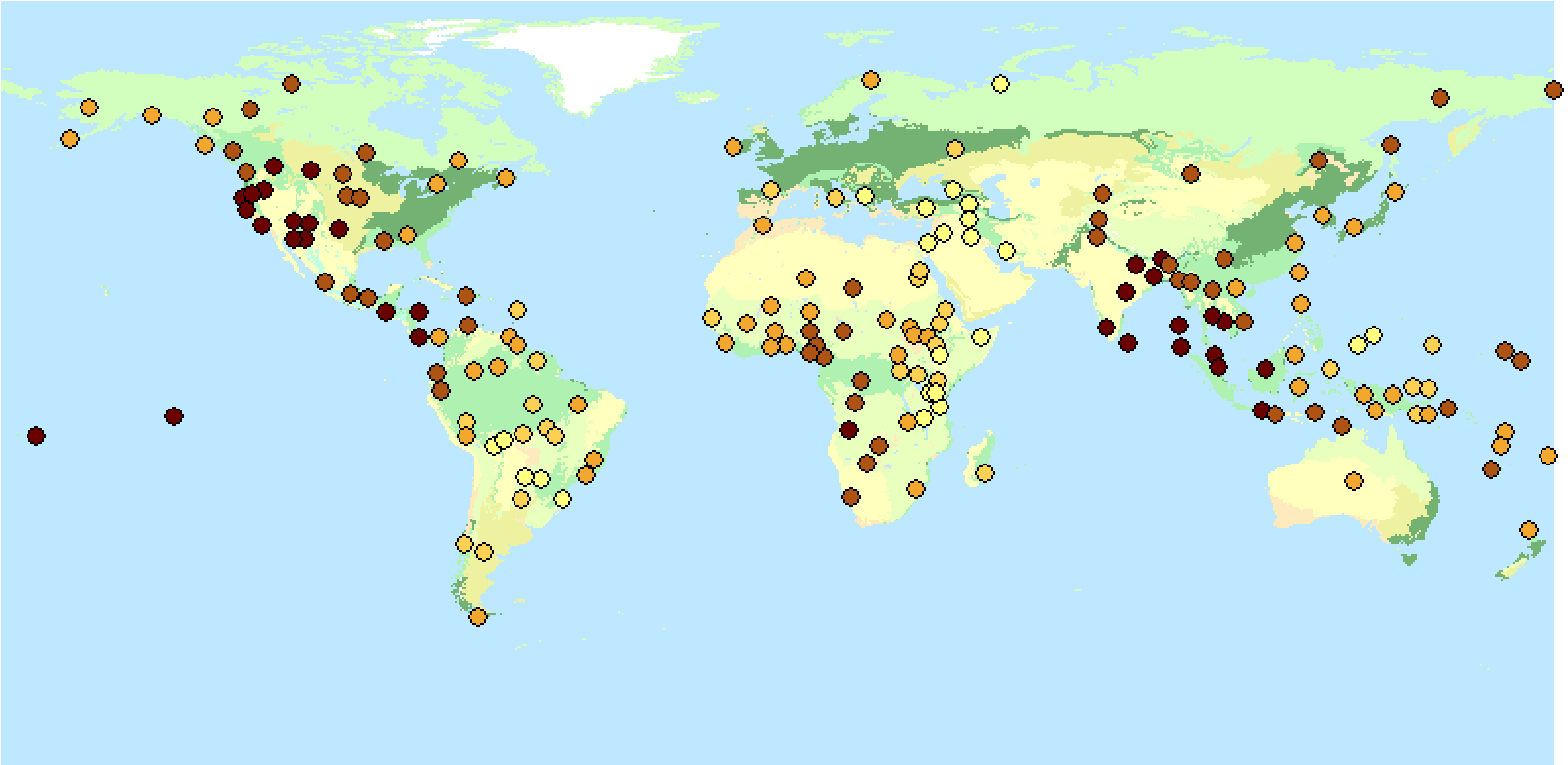

Figure 2: Honesty. This map presents the local-G* values, using the 10 nearest neighbors, based on the mean of the 50 multiple imputation values. Values are therefore smoothed, and are informative of the existence of local clusters, rather than the values of specific societies. Darker colors represent higher levels of inculcation of honesty; lighter colors are lower levels. Honesty is not significantly autocorrelated (see Table 1b); nevertheless, the smoothing shows a spatial structure similar to that for trust (in Figure 1).

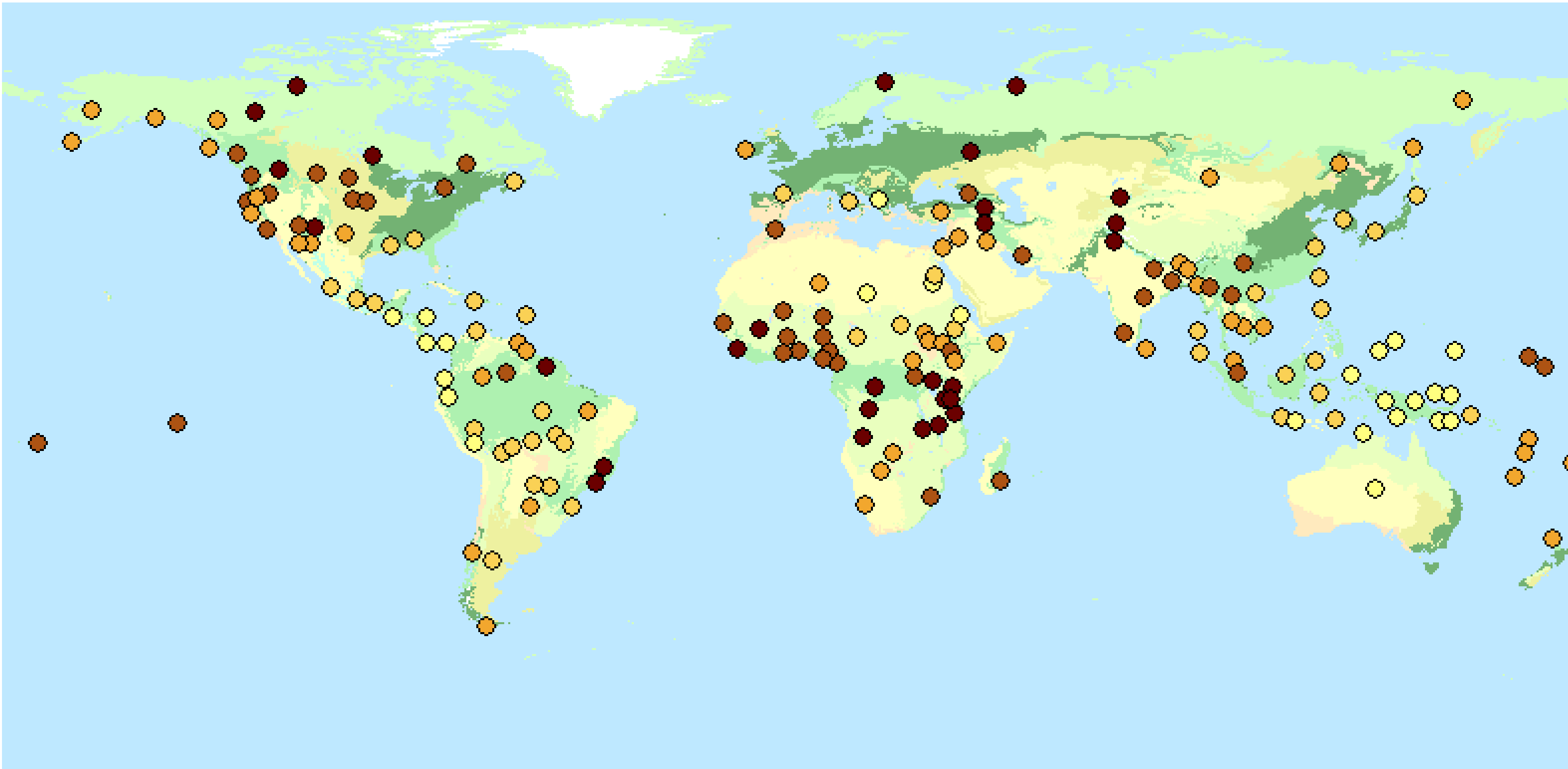

Figure 3: Generosity. This map presents the local-G* values, using the 10 nearest neighbors, based on the mean of the 50 multiple imputation values. Values are therefore smoothed, and are informative of the existence of local clusters, rather than the values of specific societies. Darker colors represent higher levels of inculcation of generosity; lighter colors are lower levels. Generosity is not significantly autocorrelated (see Table 1b). The spatial structure created by smoothing is not that similar to the spatial structure for honesty (Figure 2) and trust (Figure 1).

Table 1a: Descriptive statistics for data from SCCS

variables	Description	Sign	SCCS	mean	max	min	sd	nobs	mnSDm	trust	gener	honest
Markets												
markin	Internal markets	+	v1733	2.792	4	1	1.187	96	7.200	-0.226 *	-0.070	-0.111
markout	External markets	+	v1734	3.333	4	1	0.969	99	6.620	-0.061	0.128	-0.053
money	True money	+	v155	2.511	5	1	1.479	186	0	-0.200 **	0.027	-0.048
Cooperation												
commland	Communality of land	+	v1726	2.306	3	1	0.817	98	6.337	-0.056	-0.048	-0.047
sharefood	Shared food	+	v1718	4.461	7	1	1.895	89	6.621	0.136	0.390 ***	0.141
Property												
inhreal	Inherit land and structures	+	(v278>1)	0.619	1	0	0.487	155	2.330	-0.229 **	-0.225 **	-0.220 **
inhmove	Inherit movables	+	(v279>1)	0.862	1	0	0.346	152	2.675	-0.167 *	-0.160	-0.166
Religion												
moralgods	Gods support morality	+	v238	2.149	4	1	1.192	168	1.625	-0.068	-0.056	-0.052
Scarcity												
marrgood	Goods exchanged at marriage	-	(v208<4)	0.597	1	0	0.492	186	0	-0.101	0.037	-0.085
polygamy	Polygamy	-	v79	3.118	4	1	0.711	186	0	-0.114	0.115	-0.211 **
foodscarc	Chronic hunger	-	v1685	2.139	5	1	1.277	144	3.880	0.014	-0.176	-0.067
ecorich	Rich environment	+	v857	3.554	6	1	1.265	186	0	-0.112	-0.214 **	-0.071
Warfare												
warintern	Frequent internal warfare	-	v1649	7.250	17	1	6.483	152	3.065	-0.192 **	0.012	-0.215 **
warextern	Frequent external warfare	+	v1650	8.097	17	1	6.663	154	2.920	-0.136	-0.028	-0.110
nsoc150	Number societies within 150 miles	+	(v1865+v1875)/2	4.194	27	0	4.995	183	0.369	-0.225 ***	0.026	-0.105
Nepotism												
famsize	Size of family	-	v80	3.231	5	1	1.237	186	0	-0.091	0.016	-0.049
ncmallow	Restrictions on cousin marriage	+	v227	4.810	8	1	2.572	174	1.270	0.104	-0.124	0.124
exogamy	Exogamy	+	v72	3.195	5	1	1.200	185	0.191	0.031	0.085	0.042
Coercion												
sanctions	Coercion enforces authority	-?	v1743	1.776	3	0	1.145	98	6.404	-0.039	-0.259 *	-0.102
Valuation of children												
valuechil	Degree children valued	+	(v473+v474+v475+v476)/4	6.006	9	2	1.425	171	1.448	0.395 ***	0.378 ***	0.236 **
Dependent variables												
gener	Generosity inculcated		v334	6.010	10	1	1.830	104	6.082	0.447 ***	1 ***	0.399 ***
trust	Trust inculcated		v335	5.152	10	0	2.234	138	3.735	1 ***	0.447 ***	0.453 ***
honest	Honesty inculcated		v336	4.418	10	0	2.034	110	6.448	0.453 ***	0.399 ***	1 ***

Notes: "Sign" is the expected sign of coefficients when regressed on the dependent variables. "SCCS" gives the variable number from the Standard Cross-Cultural Sample; variables are described more fully in Appendix B. "mnSDm" measures variation of the variable over the *m* imputed data sets: for each of the 186 societies, the standard deviation of the variable is calculated over the *m* data sets; the mean of the 186 standard deviations for each variable are reported under "mnSDm". The final three columns report the Pearson correlation coefficients for the variables with the three dependent variables; significance levels are indicated with "***" (p-value<.01), "**" (p-value<.05), and "*" (p-value<.1).

Table 1b: Spatial autocorrelation in both original and multiply imputed data

Variable	Description	nobs	Moran's I: p-value from original data	Moran's I: p-value from MI data
Markets				
markin	Internal markets	96	0.3383	0.3323
markout	External markets	99	0.0148	0.0301
money	True money	186	0.0000	0.0000
Cooperation				
commland	Communality of land	98	0.0385	0.0025
sharefood	Shared food	89	0.1874	0.0010
Property				
inhreal	Inherit land and structures	155	0.0000	0.0000
inhmove	Inherit movables	152	0.0000	0.0000
Religion				
moralgods	Gods support morality	168	0.0000	0.0000
Scarcity				
marrgood	Goods exchanged at marriage	186	0.0005	0.0005
polygamy	Polygamy	186	0.0000	0.0000
foodscarc	Chronic hunger	144	0.8530	1.0000
ecorich	Rich environment	186	0.0000	0.0000
Warfare				
warintern	Frequent internal warfare	152	0.0191	0.0072
warextern	Frequent external warfare	154	0.0000	0.0084
nsoc150	Number societies within 150 miles	183	0.0000	0.0000
Nepotism				
famsize	Size of family	186	0.0000	0.0000
ncmallow	Restrictions on cousin marriage	174	0.0000	0.0000
exogamy	Exogamy	185	0.0000	0.0000
Coercion				
sanctions	Coercion enforces authority	98	0.0010	0.0153
Valuation of children				
valuechil	Degree children valued	171	0.0519	0.0244
Dependent variables				
gener	Generosity inculcated	104	0.7234	0.3522
trust	Trust inculcated	138	0.0295	0.0642
honest	Honesty inculcated	110	0.5260	0.3412

Notes: The two rightmost columns report the p-value from a Moran's I test, where the null hypothesis is that there is no spatial autocorrelation. The test is for distance (not language), using the 10 nearest neighbors. The first of the two columns tests over the original data, which contains missing values. The second of the two columns combines the results of Moran's I tests over each of the *m* multiply imputed data sets. Equations 12 and 13 in the text are used to combine the *m* test results.

Table 2a: Generosity, unrestricted and restricted models

Variable	Description	coef.	%sign	p-value	coef.	%sign	p-value
Spatial lags							
gd	Spatial lag(Distance)	0.0905	86	0.3903	0.0968	84	0.3922
gl	Spatial lag(Language)	0.0504	72	0.6185	-	-	-
Markets							
markin	Internal markets	0.0662	64	0.6832	-	-	-
markout	External markets	0.2613	98	0.0541	0.2308	98	0.0525
money	True money	-0.0007	54	0.9955	-	-	-
Cooperation							
commland	Communality of land	-0.1641	92	0.1874	-0.1683	96	0.1073
sharefood	Shared food	0.2227	100	0.1143	0.2315	100	0.0326
Property							
inhreal	Inherit land and structures	-0.2140	98	0.1030	-0.2117	98	0.0483
inhmove	Inherit movables	-0.2200	100	0.0210	-0.1783	100	0.0314
Religion							
moralgods	Gods support morality	0.0491	76	0.5809	-	-	-
Scarcity							
marrgood	Goods exchanged at marriage	0.0810	84	0.4265	-	-	-
polygamy	Polygamy	-0.1081	86	0.3498	-0.0672	80	0.5167
foodscarc	Chronic hunger	-0.1585	100	0.0621	-0.1750	100	0.0343
ecorich	Rich environment	0.0833	86	0.4040	0.0773	88	0.3936
Warfare							
warintern	Frequent internal warfare	0.1056	82	0.4749	-	-	-
warextern	Frequent external warfare	-0.0089	50	0.9566	-	-	-
nsoc150	Number societies within 150 miles	0.0606	78	0.5347	-	-	-
Nepotism							
famsize	Size of family	-0.0757	92	0.3830	-0.0788	94	0.3595
ncmallow	Restrictions on cousin marriage	-0.0299	74	0.7211	-	-	-
exogamy	Exogamy	0.1368	98	0.0767	0.1487	100	0.0510
Coercion							
sanctions	Coercion enforces authority	-0.0540	70	0.6924	-	-	-
Valuation of children							
valuechil	Degree children valued	0.3441	100	0.0000	0.3305	100	0.0000

Notes: "%sign" gives the percentage of the *m* estimations where the estimated coefficient has the same sign as the mean estimated coefficient given in the table. Coefficients are calculated using Equation 4, and the p-values using Equation 8. All coefficients are standardized. *F-test on Restrictions*, p-value=0.099.

Table 2b: Generosity, restricted model

Variable	Description	coef.	F-stat	df	p-value	γ_i	VIF
inhreal	Inherit land and structures	-0.2117	3.9605	157	0.0483	0.5638	1.9581
inhmove	Inherit movables	-0.1783	4.6648	378	0.0314	0.3634	1.3888
foodscarc	Chronic hunger	-0.1750	4.5335	223	0.0343	0.4730	1.6208
commland	Communality of land	-0.1683	2.6258	144	0.1073	0.5892	2.1242
famsize	Size of family	-0.0788	0.8439	184	0.3595	0.5207	1.3115
polygamy	Polygamy	-0.0672	0.4232	107	0.5167	0.6820	1.3428
ecorich	Rich environment	0.0773	0.7314	171	0.3936	0.5400	1.4409
gd	Spatial lag(Distance)	0.0968	0.7385	99	0.3922	0.7089	1.6539
exogamy	Exogamy	0.1487	3.8420	270	0.0510	0.4301	1.7822
markout	External markets	0.2308	3.8559	96	0.0525	0.7199	1.5910
sharefood	Shared food	0.2315	4.6715	122	0.0326	0.6402	1.7492
valuechil	Degree children valued	0.3305	19.2247	292	0.0000	0.4138	1.6216

Notes: γ_i is obtained from Equation 11 in the text; the coefficients from Equation 4; the degrees of freedom from Equation 9; and the p-values from Equation 8. R^2=0.4305. *m*=50. *RESET test*, p-value=1; *Heteroskedasticity*, p-value=1; *LM test for spatial error (Language)*, p-value=0.3741; *LM test for spatial lag (Language)*, p-value=0.467; *LM test for spatial error (Distance)*, p-value=0.2827; *LM test for spatial lag (Distance)*, p-value=0.7226.

Table 3a: Honesty, unrestricted and restricted models

Variable	Description	coef.	%sign	p-value	coef.	%sign	p-value
Spatial lags							
hd	Spatial lag(Distance)	0.0758	86	0.4911	-	-	-
hl	Spatial lag(Language)	0.0485	72	0.6344	-	-	-
Markets							
markin	Internal markets	-0.0076	48	0.9557	-	-	-
markout	External markets	-0.0741	80	0.5716	-	-	-
money	True money	0.0603	80	0.5652	-	-	-
Cooperation							
commland	Communality of land	-0.0515	68	0.7254	-	-	-
sharefood	Shared food	0.2137	98	0.1086	0.1775	96	0.1569
Property							
inhreal	Inherit land and structures	-0.2572	100	0.0606	-0.2607	100	0.0172
inhmove	Inherit movables	0.1098	86	0.3726	0.0644	74	0.5833
Religion							
moralgods	Gods support morality	-0.0012	54	0.9907	-	-	-
Scarcity							
marrgood	Goods exchanged at marriage	-0.0099	50	0.9261	-	-	-
polygamy	Polygamy	-0.2068	100	0.0251	-0.2398	100	0.0053
foodscarc	Chronic hunger	-0.0650	78	0.5388	-	-	-
ecorich	Rich environment	0.1302	96	0.2250	0.1331	100	0.1612
Warfare							
warintern	Frequent internal warfare	-0.0949	82	0.5241	-	-	-
warextern	Frequent external warfare	-0.1187	82	0.4500	-0.1675	98	0.1268
nsoc150	Number societies within 150 miles	-0.0905	90	0.3471	-0.0477	78	0.5953
Nepotism							
famsize	Size of family	-0.0076	50	0.9394	-	-	-
ncmallow	Restrictions on cousin marriage	0.0552	86	0.5444	-	-	-
exogamy	Exogamy	0.1477	98	0.1001	0.1520	100	0.0797
Coercion							
sanctions	Coercion enforces authority	-0.0577	72	0.7010	-	-	-
Valuation of children							
valuechil	Degree children valued	0.1961	100	0.0255	0.2191	100	0.0116

Notes: "%sign" gives the percentage of the *m* estimations where the estimated coefficient has the same sign as the mean estimated coefficient given in the table. Coefficients are calculated using Equation 4, and the p-values using Equation 8. All coefficients are standardized. *F-test on Restrictions*, p-value=0.0587.

Table 3b: Honesty, restricted model

Variable	Description	coef.	F-stat	df	p-value	γ_i	VIF
inhreal	Inherit land and structures	-0.2607	5.7894	173	0.0172	0.5377	1.5647
polygamy	Polygamy	-0.2398	7.8769	342	0.0053	0.3822	1.4412
warextern	Frequent external warfare	-0.1675	2.3615	132	0.1268	0.6154	1.9840
nsoc150	Number societies within 150 miles	-0.0477	0.2828	273	0.5953	0.4277	1.7649
inhmove	Inherit movables	0.0644	0.3025	127	0.5833	0.6266	2.1221
ecorich	Rich environment	0.1331	1.9738	277	0.1612	0.4244	1.6173
exogamy	Exogamy	0.1520	3.0951	271	0.0797	0.4295	1.5825
sharefood	Shared food	0.1775	2.0300	118	0.1569	0.6498	1.7416
valuechil	Degree children valued	0.2191	6.4624	276	0.0116	0.4256	1.3871

Notes: γ_i is obtained from Equation 11 in the text; the coefficients from Equation 4; the degrees of freedom from Equation 9; and the p-values from Equation 8. R^2=0.2418. *m*=50. *RESET test*, p-value=0.5737; *Heteroskedasticity*, p-value=0.4494; *LM test for spatial error (Language)*, p-value=1; *LM test for spatial lag (Language)*, p-value=1; *LM test for spatial error (Distance)*, p-value=0.4813; *LM test for spatial lag (Distance)*, p-value=0.6341.

Table 4a: Trust, unrestricted and restricted models

Variable	Description	coef.	%sign	p-value	coef.	%sign	p-value
Spatial lags							
td	Spatial lag(Distance)	0.1667	100	0.1081	0.1888	100	0.0225
tl	Spatial lag(Language)	0.0311	72	0.7563	-	-	-
Markets							
markin	Internal markets	-0.1461	96	0.1894	-0.1286	96	0.1605
markout	External markets	0.0379	76	0.7466	-	-	-
money	True money	-0.1569	100	0.0982	-0.0878	100	0.2661
Cooperation							
commland	Communality of land	-0.1375	92	0.2828	-	-	-
sharefood	Shared food	0.1618	98	0.1618	0.1285	96	0.1852
Property							
inhreal	Inherit land and structures	-0.2538	100	0.0323	-0.1784	100	0.0505
inhmove	Inherit movables	-0.0080	54	0.9361	-	-	-
Religion							
moralgods	Gods support morality	0.0253	56	0.7948	-	-	-
Scarcity							
marrgood	Goods exchanged at marriage	0.0029	56	0.9722	-	-	-
polygamy	Polygamy	-0.0398	76	0.6615	-	-	-
foodscarc	Chronic hunger	0.1572	100	0.1116	0.1111	96	0.1772
ecorich	Rich environment	0.0629	88	0.4915	-	-	-
Warfare							
warintern	Frequent internal warfare	-0.0054	52	0.9660	-	-	-
warextern	Frequent external warfare	-0.1083	88	0.4124	-	-	-
nsoc150	Number societies within 150 miles	-0.1834	100	0.0247	-0.2163	100	0.0028
Nepotism							
famsize	Size of family	-0.0879	96	0.2741	-	-	-
ncmallow	Restrictions on cousin marriage	0.1085	94	0.2150	0.1106	96	0.1832
exogamy	Exogamy	0.0513	86	0.4910	-	-	-
Coercion							
sanctions	Coercion enforces authority	0.1139	98	0.2900	-	-	-
Valuation of children							
valuechil	Degree children valued	0.2925	100	0.0001	0.2949	100	0.0001

Notes: "%sign" gives the percentage of the *m* estimations where the estimated coefficient has the same sign as the mean estimated coefficient given in the table. Coefficients are calculated using Equation 4, and the p-values using Equation 8. All coefficients are standardized. *F-test on Restrictions*, p-value=0.1027.

Table 4b: Trust, restricted model

Variable	Description	coef.	F-stat	df	p-value	γ_i	VIF
nsoc150	Number societies within 150 miles	-0.2163	8.9999	1,133	0.0028	0.2093	1.7817
inhreal	Inherit land and structures	-0.1784	3.8509	350	0.0505	0.3779	1.6195
markin	Internal markets	-0.1286	1.9841	198	0.1605	0.5022	1.5533
money	True money	-0.0878	1.2375	1,773	0.2661	0.1672	1.7568
ncmallow	Restrictions on cousin marriage	0.1106	1.7801	290	0.1832	0.4150	2.0840
foodscarc	Chronic hunger	0.1111	1.8296	290	0.1772	0.4154	1.9845
sharefood	Shared food	0.1285	1.7689	180	0.1852	0.5264	1.7615
td	Spatial lag(Distance)	0.1888	5.2623	287	0.0225	0.4174	1.5790
valuechil	Degree children valued	0.2949	16.4408	724	0.0001	0.2621	2.0000

Notes: γ_i is obtained from Equation 11 in the text; the coefficients from Equation 4; the degrees of freedom from Equation 9; and the p-values from Equation 8. R^2=0.3148. *m*=50. *RESET test*, p-value=1; *Heteroskedasticity*, p-value=1; *LM test for spatial error (Language)*, p-value=1; *LM test for spatial lag (Language)*, p-value=0.7152; *LM test for spatial error (Distance)*, p-value=0.5015; *LM test for spatial lag (Distance)*, p-value=0.5525.

Table 5a: Trust (Generosity and Honesty as independent variables)

Variable	Description	coef.	%sign	p-value	coef.	%sign	p-value
Spatial lags							
td	Spatial lag(Distance)	0.1892	100	0.0568	0.2038	100	0.0096
tl	Spatial lag(Language)	0.0256	68	0.7753	-	-	-
Instruments for gener & honest							
geni	Instrument for Generosity	0.3136	100	0.0106	0.2844	100	0.0028
honi	Instrument for Honesty	0.2498	100	0.0361	0.2551	100	0.0059
Markets							
markin	Internal markets	-0.1634	96	0.1477	-0.1563	100	0.0788
markout	External markets	-0.0209	58	0.8740	-	-	-
money	True money	-0.1827	100	0.0488	-0.2004	100	0.0078
Cooperation							
commland	Communality of land	-0.0612	68	0.6431	-	-	-
sharefood	Shared food	0.0214	64	0.8727	-	-	-
Property							
inhreal	Inherit land and structures	-0.0794	84	0.5326	-	-	-
inhmove	Inherit movables	0.0279	60	0.7896	-	-	-
Religion							
moralgods	Gods support morality	0.0153	52	0.8711	-	-	-
Scarcity							
marrgood	Goods exchanged at marriage	-0.0230	62	0.7989	-	-	-
polygamy	Polygamy	0.0697	88	0.4603	-	-	-
foodscarc	Chronic hunger	0.2271	100	0.0151	0.2070	100	0.0130
ecorich	Rich environment	-0.0009	54	0.9924	-	-	-
Warfare							
warintern	Frequent internal warfare	-0.0007	50	0.9957	-	-	-
warextern	Frequent external warfare	-0.0713	74	0.6075	-	-	-
nsoc150	Number societies within 150 miles	-0.1765	100	0.0393	-0.1589	100	0.0285
Nepotism							
famsize	Size of family	-0.0648	86	0.4380	-	-	-
ncmallow	Restrictions on cousin marriage	0.0968	92	0.2808	-	-	-
exogamy	Exogamy	-0.0477	84	0.5403	-	-	-
Coercion							
sanctions	Coercion enforces authority	0.1468	96	0.1901	0.1126	100	0.2148
Valuation of children							
valuechil	Degree children valued	0.1132	98	0.1893	0.1317	100	0.0838

Notes: "%sign" gives the percentage of the *m* estimations where the estimated coefficient has the same sign as the mean estimated coefficient given in the table. Coefficients are calculated using Equation 4, and the p-values using Equation 8. All coefficients are standardized. *F-test on Restrictions*, p-value=0.1322.

Table 5b: Trust (Generosity and Honesty as indep. variables), restricted model

Variable	Description	coef.	F-stat	df	p-value	γ_i	VIF
money	True money	-0.2004	7.1147	653	0.0078	0.2760	1.8098
nsoc150	Number societies within 150 miles	-0.1589	4.8216	524	0.0285	0.3085	2.1968
markin	Internal markets	-0.1563	3.1240	186	0.0788	0.5184	1.8193
sanctions	Coercion enforces authority	0.1126	1.5465	244	0.2148	0.4530	2.1386
valuechil	Degree children valued	0.1317	2.9989	593	0.0838	0.2898	2.1589
fid	Spatial lag(Distance)	0.2038	6.7955	306	0.0096	0.4039	1.8732
foodscarc	Chronic hunger	0.2070	6.2616	241	0.0130	0.4550	2.5568
honi	Instrument for Honesty	0.2551	7.7616	185	0.0059	0.5202	1.6720
geni	Instrument for Generosity	0.2844	9.1259	207	0.0028	0.4909	2.0342

Notes: γ_i is obtained from Equation 11 in the text; the coefficients from Equation 4; the degrees of freedom from Equation 9; and the p-values from Equation 8. R^2=0.3976. *m*=50. *RESET test*, p-value=1; *Heteroskedasticity*, p-value=1; *LM test for spatial error (Language)*, p-value=1; *LM test for spatial lag (Language)*, p-value=0.7234; *LM test for spatial error (Distance)*, p-value=0.4766; *LM test for spatial lag (Distance)*, p-value=0.4885.

Table 6: Signs of coefficients, unrestricted and restricted models

Variable	Description	Exp. Sign	gener (Table 2)	honest (Table 3)	trust (Table 4)	trustGH (Table 5)
Spatial lags						
td, hd, gd	Spatial lag(Distance)	+	+	+	+ (+)	+ (+)
tl, hl, gl	Spatial lag(Language)	+	+	+	+	+
Instruments for gener & honest						
geni	Instrument for Generosity	+				+ (+)
honi	Instrument for Honesty	+				+ (+)
Markets						
markin	Internal markets	+	+	-	-	- (-)
markout	External markets	+	+ (+)	-	+	-
money	True money	+	-	+	-	- (-)
Cooperation						
commland	Communality of land	+	-	-	-	-
sharefood	Shared food	+	+ (+)	+	+	+
Property						
inhreal	Inherit land and structures	+	- (-)	- (-)	- (-)	-
inhmove	Inherit movables	+	- (-)	+	-	+
Religion						
moralgods	Gods support morality	+	+	-	+	+
Scarcity						
marrgood	Goods exchanged at marriage	-	+	-	+	-
polygamy	Polygamy	-	-	- (-)	-	+
foodscarc	Chronic hunger	-	- (-)	-	+	+ (+)
ecorich	Rich environment	+	+	+	+	-
Warfare						
warintern	Frequent internal warfare	-	+	-	-	-
warextern	Frequent external warfare	+	-	-	-	-
nsoc150	Number societies within 150 miles	+	+	-	- (-)	- (-)
Nepotism						
famsize	Size of family	-	-	-	-	-
ncmallow	Restrictions on cousin marriage	+	-	+	+	+
exogamy	Exogamy	+	+ (+)	+ (+)	+	-
Coercion						
sanctions	Coercion enforces authority	-?	-	-	+	+
Valuation of children						
valuechil	Degree children valued	+	+ (+)	+ (+)	+ (+)	+ (+)

Notes: The first column gives the expected sign of the coefficient. The following four columns give the sign in the four unrestricted models. If the coefficient proved significant in the restricted model (p-value<0.1), then the sign in the restricted model is added, in parentheses.

Appendix A. Dependent variables.

Herbert Barry III, Lili Josephson, Edith Lauer, and Catherine Marshall examined ethnographies for evidence of traits inculcated in childhood (Barry et al. 1976). The ages are approximately four through 12, though the beginning and end stages are defined emically (Barry et al. 1976: 85-86).

> "The inculcated traits were coded, if possible, on the basis of reports of the pressures exerted by the people who train the child. The codes were also based on the behavior of the child and were inferred only with great caution from reports of the customary adult behavior or of adult ideology" (Barry et al. 1976: 91).

Barry et al. examined 13 different traits, arranged in five categories. The category called "sociability" contains the traits "generosity", "honesty", and "trust".

> "Generosity… refers to the specific behavior encouraged rather than a general attitude, but a wide range of actions may exemplify generosity. These include giving and sharing of food, possessions, time, or services to others of the community or outsiders, e.g., sharing the product of a hunt among the community members whether or not they were active in it its attainment, or sharing and giving treats or toys. Expressions of kindness and affection are included, especially toward younger children or aged, ill, or infirm people. Reciprocity is not necessarily generosity." (Barry et al. 1976: 95)

> "Trust… or mutual confidence… refers to confidence in social relationships, especially towards community members outside the family, e.g., children are welcome in any home in the village, possessions are left unguarded. Sorcery and witchcraft generally indicate a low rating of trust. The code is omitted where in-group and out-group differ widely." (Barry et al. 1976: 95)

> "Honesty… refers to desire and strong approval for truthfulness under all circumstances. Stealing or other criminal or anti-social behavior by children indicate low honesty. It is possible to have high emphasis on honesty towards one's own social group along with approval for lying, cheating, and stealing against an out-group. It takes into account societies where the concept of honesty differs from ours, e.g., lying is considered 'smart', but stealing is dishonest." (Barry et al. 1976: 95)

Appendix B: SCCS variables

```
MARKIN=V1733
1733.  Market exchange within local community

     90    . = missing data
     23    1 = no market exchange (original code 10)
     10    2 = market exchange within local community present, no
           *   further information (original code 20)
     27    3 = market exchange within local community present, involving
           *   local and regional products (original code 21)
     36    4 = market exchange within local community present, involving
           *   local, regional, and supra-regional products (original
           *   code 22)

MARKOUT=V1734
1734.  Market exchange outside of local community

     87    . = missing data
     10    1 = no market exchange outside of local community
           *   (original code 10)
      5    2 = market exchange outside of local community (at trading
           *   posts, market places), no further information (original
           *   code 20)
     26    3 = market exchange outside of local community, involving
           *   local and regional products (original code 21)
     58    4 = market exchange outside of local community, involving
           *   local, regional, and supra-regional products (original
           *   code 22)

MONEY=V155
155.  SCALE 7-  MONEY

     77    1 = None
     14    2 = Domestically usable articles
     43    3 = Alien currency
     27    4 = Elementary forms
     25    5 = True money

COMMHH=V1726
1726. Communality of land

     88    . = missing data
     22    1 = land predominantly private property
     24    2 = land partially communally used
     52    3 = communal land use rights only

SHAREFOOD=V1718
1718. Sharing of food

     97    . = missing data
      7    1 = sharing of food among nuclear family
     14    2 = sharing of food among kin residing in local community
      9    3 = sharing of food among kin, not restricted to local
           *   community
      4    4 = sharing of food among non-kin within local community
     21    5 = sharing of food among all members of local community
     24    6 = sharing of food among groups within unit of maximal
           *   political authority or ethnic group
     10    7 = sharing of food among other than mentioned groups

INHREAL=(V278>1)*1
INHMOVE=(V279>1)*1
```

278. INHERITANCE OF REAL PROPERTY (LAND)
279. INHERITANCE OF MOVABLE PROPERTY

* Note change in order from 278 280	278 Land	279 Movables
. = Missing data	31	34
1 = Absence of individual property rights or rules	59	22
2 = Matrilineal (sister's sons)	4	5
3 = Other matrilineal heirs (e.g., younger brothers)	9	9
4 = Children, with daughters receiving less	12	14
5 = Children, equally for both sexes	9	22
6 = Other patrilineal heirs (e.g., younger brothers)	8	9
7 = Patrilineal (sons)	54	71

MORALGODS=V238
238. HIGH GODS

18	. = Missing data
68	1 = Absent or not reported
47	2 = Present but not active in human affairs
13	3 = Present and active in human affairs but not supportive of human morality
40	4 = Present, active, and specifically supportive of human morality

MARRGOOD=(V208<4)*1
208. MODE OF MARRIAGE

1 = Bride-Price or -Wealth, to bride's family	71
2 = Dowry, to bride from her family	24
3 = Gift Exchange, reciprocal	16
4 = Absence of Consideration	15
5 = Bride-Service, to bride's family	9
6 = Token Bride-price	42
7 = Sister or Female Relative Exchanged for Bride	9
9 = No Alternative	

POLYGAMY=V79
79. POLYGAMY

2	1 = Polyandry - primarily monogamous with some plural husbands
31	2 = Monogamy
96	3 = Polygyny < 20 plural wives (if more frequent than polyandry)
57	4 = Polygyny > 20 plural wives (if more frequent than polyandry)

FOODSCARC=V1685 (0 and 8 → missing)
1685. Chronic resource problems (resolved ratings)

16	0 = No resolved rating (original code 0)
73	1 = Low or rare (original code 1)
6	2 = original code 1.5
44	3 = There are some "hungry times" during the year when * people complain that they do not have enough food or * enough of a particular food (original code 2)
14	4 = Some members of the population usually do not have * enough to eat (original code 3)
7	5 = Most members of the population usually do not have * enough to eat - i.e., they are chronically * undernourished (original code 4)
26	8 = Don't know (original code 8)

ECORICH=V857
857. Climate Type - Ordered in terms of Open Access to Rich Ecological Resources D. White and M. Burton 1986

```
       6    1 = Polar
      38    2 = Desert or cold steppe
      50    3 = Tropical rainforest
      39    4 = Moist temperate
      45    5 = Tropical savanna
       8    6 = Tropical highlands
```

WARINTERN=V1649 (0 and 88 set to missing)

```
1649.  Frequency of internal warfare (resolved rating)
      23    0 = No resolved rating (original code 0)
      60    1 = Internal warfare seems to be absent or rare
            *   (original code 1)
       4    2 = original code 1.25
       5    3 = original code 1.5
       4    4 = original code 1.75
       7    5 = Internal warfare seems to occur once every 3 to 10
            *   years (original code 2)
       3    6 = original code 2.25
       5    7 = original code 2.5
       2    8 = original code 2.75
       4    9 = Internal warfare seems to occur once every 2 years
            *   (original code 3)
       3   10 = original code 3.25
       6   11 = original code 3.5
       2   12 = original code 3.75
       8   13 = Internal warfare seems to occur every year, but
            *   usually only during a particular season (original code 4)
       1   14 = original code 4.25
      10   15 = original code 4.5
       1   16 = original code 4.75
      27   17 = Internal warfare seems to occur almost constantly and
            *   at any time of the year (original code 5)
      11   88 = Don't know or unclear (original code 8)
```

WAREXTERN=V1649 (0 and 88 set to missing)

```
1650.  Frequency of external warfare (resolved rating)
      26    0 = No resolved rating (original code 0)
      52    1 = External warfare seems to be absent or rare (original code 1)
       2    2 = original code 1.25
       8    3 = original code 1.5
       1    4 = original code 1.75
      10    5 = External warfare seems to occur once every 3 to 10 years (code 2)
       3    6 = original code 2.25
       7    7 = original code 2.5
       2    8 = original code 2.75
       6    9 = External warfare seems to occur at least once every
            *   two years (original code 3)
       3   10 = original code 3.25
       3   11 = original code 3.5
       3   12 = original code 3.75
       5   13 = External warfare seems to occur every year, but
            *   usually only during a particular season (original code 4)
       1   14 = original code 4.25
       7   15 = original code 4.5
       4   16 = original code 4.75
      37   17 = External warfare seems to occur almost constantly and
            *   at any time of the year (original code 5)
       6   88 = Don't know or unclear (original code 8)
```

NSOC150=(V1865+V1875)/2

```
1865.  Concordance: number of societies within 150 mile radius
       3    . = Missing data or society not coded
```

```
      65    0 = 0
      35    1 = 1
      21    2 = 2
      15    3 = 3
       8    4 = 4
      10    5 = 5
       3    6 = 6
       5    7 = 7
       1    8 = 8
       2    9 = 9
       2   10 = 10
       5   11 = 11
       2   12 = 12
       1   13 = 13
       1   14 = 14
       1   16 = 16
       3   17 = 17
       1   18 = 18
       1   20 = 20
       1   27 = 27
```

1875. Atlas: number of societies within 150 mile radius

```
       3    . = Missing data or society not coded
      31    0 = 0
      27    1 = 1
      16    2 = 2
      12    3 = 3
      13    4 = 4
      17    5 = 5
      13    6 = 6
       7    7 = 7
      13    8 = 8
       7    9 = 9
       3   10 = 10
       5   11 = 11
       4   12 = 12
       2   13 = 13
       3   14 = 14
       1   15 = 15
       1   17 = 17
       1   18 = 18
       1   22 = 22
       1   23 = 23
       1   24 = 24
       1   28 = 28
       1   34 = 34
       1   38 = 38
       1   48 = 48
```

FAMSIZE=V80

80. FAMILY SIZE

```
       7    1 = Nuclear Monogamous
      70    2 = Nuclear Polygynous
             3 = Stem Family
      59    4 = Small extended
      34    5 = Large extended
```

NCMALLOW=V227

227. NUMBER OF COUSIN MARRIAGES (Allowed)

```
        . = Missing Data                                  13
        1 = All four cousins                              25
```

2 = Three of four cousins	8
3 = Two of four cousins (e.g., paternal)	44
4 = One of four cousins (e.g., FaBrDa)	6
5 = No first cousins	19
6 = First and some second cousins excluded	2
7 = No first, unknown for second	27
8 = No first or second cousins	42

EXOGAMY=V72

72. INTERCOMMUNITY MARRIAGE

1	. = Missing data
11	1 = Local endogamy 90-100
50	2 = Local endogamy 61-89 (agamous)
51	3 = Local endogamy 40-60 (agamous)
38	4 = Local endogamy 11-39 (agamous)
35	5 = Local endogamy 0-10 (exogamy)

SANCTIONS=V1743

1743. Sanctions

88	. = missing data
17	0 = no formal political office present (variable 1740 coded * as 1) (original code 88)
26	1 = no or few means of coercion
17	2 = restricted means of coercion, e.g. only for certain * types of decisions
38	3 = coercive means to enforce all decisions

VALUECHIL=(V473+V474+V475+V476)/4

473. Evaluation by Society: Early Boys
474. Evaluation by Society: Early Girls
475. Evaluation by Society: Late Boys
476. Evaluation by Society: Late Girls

Evaluation by Society: degree to which children are desired and valued.

. = Missing data	14	15	15	15
0 = Children are viewed indifferently or as a liability by society and local community	-	-	-	-
1 =	-	1	-	1
2 = Only slight, sporadic expression of valuation of children	2	7	2	6
3 =	3	9	3	9
4 =	11	23	9	21
5 = Moderate or occasionally strong expression of value of children	39	30	39	35
6 =	46	50	48	49
7 =	32	25	32	26
8 = Strong, but no extreme valuation of children	26	18	27	17
9 = Intense, repeated expression of cultural valuation for children	13	9	12	8

GENER=V334

334. Generosity

. = Missing data	82
0 = no inculcation or opposite trait	-
1 =	1

2 =		4
3 =		6
4 =		4
5 =	moderately strong inculcation	24
6 =		31
7 =		2
8 =		27
9 =		4
	extremely strong inculcation	1

TRUST=V335

335. Trust

. =	Missing data	48
0 =	no inculcation or opposite trait	1
1 =		6
2 =		19
3 =		5
4 =		15
5 =	moderately strong inculcation	34
6 =		18
7 =		11
8 =		25
9 =		3
	extremely strong inculcation	1

HONEST=V336

336. Honesty

. =	Missing data	76
0 =	no inculcation or opposite trait	1
1 =		5
2 =		18
3 =		15
4 =		12
5 =	moderately strong inculcation	28
6 =		16
7 =		5
8 =		8
9 =		1
	extremely strong inculcation	1