In: Institutions, Contracts and Organizations: Perspectives from New Institutional Economics. Claude Ménard, ed. Pp. 158-171. Northampton, MA: Edward Elgar Publishing, Inc, 2000.

13. Experimental economics in the bush: why institutions matter

Jean Ensminger*

INTRODUCTION

'Social capital' is receiving a lot of attention in the social sciences today. One testament to its popularity is the extent to which it is being invoked *across* the social sciences. Rarely does one see so much simultaneous interest in a subject among political scientists, economists (especially in development), anthropologists and sociologists. As used by Robert Putnam (1993), social capital refers to social connections or networks, norms and trust, all of which he argues facilitate cooperation in society, and ultimately have effects on economic performance. Putnam contends that in societies where social capital is low, economic performance is likely to suffer. These are intriguing and provocative ideas. But they are not simple matters to test empirically. Nor for that matter, is it easy to see specifically how norms and trust translate into cooperation in an economic sense. In short, there is very little that we really understand about the mechanics of social capital.

The findings from some recent African research presented here do not resolve any of these issues, but are suggestive of a new focus in our discussions of this current thinking about social capital. Namely, which way do the causal arrows flow? Should our attention be focussed on differences in the generalized indigenous level of 'trust' and cooperation, or on the effect of formal institutions in fostering and generating trust and cooperation? In other words, how much is social capital itself a function of the larger institutional environment rather than an explanation for it? Experimental economics provides us with a more rigorous method to explore some of these ideas than is usually possible in the social sciences.

In this chapter I present preliminary findings from four experimental economics games carried out in August 1998, in East Africa. This project was funded by the John D. and Catherine T. MacArthur Foundation in conjunction with seven other studies of experimental economics in less-developed societies. The inspiration for these studies comes from the work of Joseph

Henrich, then a graduate student in anthropology at the University of California at Los Angeles who carried out experiments in the Amazon.

The work of experimental economists has shaken up the neo-classical models of old. Vast numbers of studies have now been done in highly developed societies that challenge some of the most simplistic economic assumptions. It appears that even in highly developed societies, individuals place some value upon sharing and cooperation even when they are given every opportunity not to. Nevertheless, it is true that repeat play and greater anonymity (for example in double-blind games) drive the results closer to the game-theoretic predictions of rationally self-interested behavior.

While experimental economists have done a number of cross-cultural studies that yield small variations (Roth et al. 1991), no drastic cultural differences emerged until Henrich's work in the Amazon in 1997 (Henrich forthcoming). Notably, this was also the first comparative work from a less-developed society. Henrich ran the ultimatum bargaining game with subsistence farmers in the Amazon (the Machiguenga) and turned up surprisingly different results from the USA and other developed world studies. Once endowed, the Machiguenga made very low offers to their partners compared to all other known studies of the ultimatum bargaining game (a mean of 26 percent versus a typical mean of 40–50 percent in the USA), and these offers were almost never rejected, while offers below 20 percent are rejected about half of the time in the USA. A simple interpretation of these findings concludes that the Machiguenga are less concerned with fairness, not prepared to pay a price for punishing stinginess, and more economically rational than Americans. Our cross-cultural project was designed to test the robustness of these findings in other less-developed populations around the world, as well as to explore many issues associated with the evolution and learning of sharing, cooperation, reciprocity, trust, self-interest and altruism. With the evolutionary focus in mind, several studies are being carried out with hunting and gathering populations in Africa, New Guinea and the Amazon, more studies of subsistence farmers are underway, and two studies are being carried out with pastoral nomads.[1]

This chapter reports early findings from one of the studies. The subject population is the Orma, who are partially nomadic cattle herders who live in a remote part of northeastern Kenya near the Somali border. I have been studying the political economy and institutional change among this population for the past 20 years. I returned in the summer of 1998 to re-census the population on demographic and economic variables (including wealth and income) and to run the ultimatum bargaining game, the dictator game, the trust game and the public goods game. My results from the ultimatum game did not conform to the Amazonian pattern, but nor did they compare exactly to studies in the developed world. Furthermore, there were some telling

results across the games that may lead us to a better understanding of the relationship among institutions, social capital and economic behavior. In particular, I shall speculate about the implications of these findings for learning cooperation. First, I present a brief overview of the ethnographic context and methods.

THE ETHNOGRAPHIC CONTEXT

The Orma are a pastoral group dependent primarily upon cattle. In recent years they have begun to settle down and engage in substantial commercial exchange (largely based upon cattle trading), and their economy is still almost entirely cattle based. Currently approximately one-third of the population is still nomadic, which also represents an attempt to live a subsistence lifestyle and resist market exchange in an effort to avoid selling productive capital through livestock sales. Two-thirds of the population is sedentary and sells livestock on a regular basis for subsistence. Outward signs of development are absent. There is no running water, no electricity, roads are scarce, and people live in grass houses with few personal possessions beyond clothing and cooking pots. Many sedentary households send their sons to primary school, a few send daughters, but relatively few children attend school for more than three years; almost all of the adult population is illiterate.

METHODS

Needless to say, running experiments in the bush presents interesting challenges, but they are not insurmountable. It is important to keep in mind though, that some conditions do vary from those pertaining when experiments are carried out in a typical laboratory setting. First of all, the players are not university undergraduates – they are average rural citizens. In fact, on this score it is actually easier to muster a representative sample of the entire population than it might be in the USA or any developed world context. This also makes it easy to draw samples stratifying for key variables such as wealth and education level. Second, the players are part of a relatively small-scale society, and although one may guarantee them anonymity from their partner, almost all people in any given village are known to one another and there may be a high degree of relatedness. In a society in which little can be kept private, assumptions about anonymity may be affected even if the only way other villagers can learn of an individual's play is if that person reveals how they played. However, it may also be the case that in societies with little privacy there is less concern about anonymity.[2] Third, the population is

largely illiterate and unfamiliar with experiments. While extensive efforts were made to ensure that all participants understood the games clearly, and relatively simple games were chosen, the possibility remains that there is more 'noise' in these results stemming from misunderstanding the task than one finds in experiments run in developed societies.

It is worth recording a few issues that one might expect to have been problematic, but that in fact were not. There was no resistance to playing the games; on the contrary, people loved them – by the end they were imploring me to make arrangements to come back as soon as possible and play more games. Grass houses are not at all a hindrance to running games. In fact they were the perfect size for isolating small groups from one another during the course of play, and one research assistant seated by the door was able to keep groups from talking about the game, exiting, or chatting with visitors. 'Crowd control' turned out to be relatively simple. People never had to wait more than three hours to finish their play, but they were willing to do so. The concept of anonymity and randomness was greatly facilitated by the use of slips of paper upon which each individual's name was written, and which controlled the order of play and the assignment to different roles. This also facilitated a general sense of fairness regarding waiting time and differential outcomes in reward.

Many conditions of the experimental design for my study were set by the group project in order to standardize across the research sites. Prior to running any games a large public meeting was held where I explained to villagers that I would be engaging in a new form of research that involved playing 'fun games' for real money. I did not discuss the specific nature of the issues that would be addressed in the research, but I did explain to them that similar experiments were being run simultaneously in other parts of the world. The discussion that ensued was one of great amusement at the 'insanity' of western ways. All games were run jointly by a bi-lingual, native-speaking research assistant and myself. Given that the research assistants are known to many of the individuals playing the games, I had the assistant turn around at the time offers were made to ensure that only I had access to that information, thus enhancing anonymity. The exception to this was the trust game. This was the most difficult game to explain and I kept the research assistant actively involved throughout in order to ensure better understanding of the game.

The stakes were standardized across sites to approximately one day's casual labor wage, with a show-up fee of one-third of a day's wage. In the Orma case, this translated into games played for 100 shillings or roughly the equivalent of $2. Each player received a show-up fee of 20 shillings at the very beginning of the game instructions.[3] This drove home the fact that they were playing for real money, and served as partial compensation to those who might not earn much in the games. Each of the game texts was back trans-

lated; that is, one native speaker translated it from English to the local language and another one, unfamiliar with the English text and the game, translated it back into English to ensure precision and clarity of meaning. All games were one-shot with no repeat play. I was careful to do exactly what I promised in each game to ensure that people did not distrust my intentions, and to facilitate understanding of the game. Feedback from trustful participants indicates that neither distrust of the experimenters, nor fear of losing anonymity was a problem.

I carried out the four games in five villages. I began with a demographic census in each village, which was successfully completed with 100 percent of the 223 households (approximately 2000 individuals). At least one individual from almost all households played one of the 144 games (262 players). Approximately 20 of the individuals who played games participated in two games, but no one played the same game twice. Each of the other players played only one game.

The data covered in the household surveys, as well as prior data from 20 years ago and 10 years ago for most households, will eventually facilitate much deeper analyses of the following variables across many of the games: gender, age, education, degree of relatedness, wealth, income, level of market integration, and nomadic versus sedentary residence.

I turn now to a discussion of each game in turn.

THE ULTIMATUM BARGAINING GAME

The ultimatum bargaining game is the most frequently replicated game in experimental economics. The game is simple. One player is offered a fixed sum of money to be divided in any way he/she chooses with another, anonymous player. The second player is told the amount received by player one and the amount that player one is offering to player two. Player two has the option of refusing the split, in which case neither player receives anything. If the second player accepts the offer, they both receive what the proposer determined the split to be.

It was Henrich's (forthcoming) study of the ultimatum bargaining game among Machiguenga Indians that inspired this project. I also expected the Orma to make very low offers and for there to be almost no refusals. I was half right (see Figure 13.1). Orma mean offers were 44 percent (exactly in line with the US range), but far higher than the 26 percent mean offer observed in the Amazon. Orma behavior departed from the US pattern, however, in the distribution. In the USA it is common to have low offers (below 25 percent), though there is a significant rejection rate in this range (Camerer n.d.). For the Orma the lowest offer out of 56 games was 30 percent, and

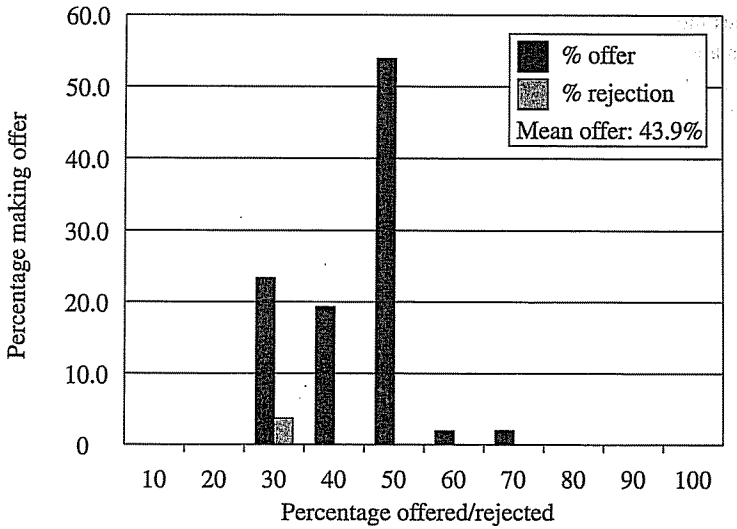

Figure 13.1 Ultimatum bargaining game (N = 56 pairs)

there were only two refusals (3.6 percent of all offers) of these 30 percent offers.

Henrich's Amazonian study was originally criticized because the experimental conditions varied so much from those pertaining in US studies. Notably, he played the games for very high stakes (2.3 days' wage in local currency), and his sample was all from a small-scale community. To meet these criticisms, he ran a study among UCLA graduate students of anthropology in an effort to replicate these conditions in the USA. He calculated the average wage rate of the students and set the stakes at $160 to make them comparable to the level of the Amazonian studies. Similarly, the size of the 'community' of graduate students was roughly comparable to that of the Amazonian population, and thus the potential confounding of small community and reputation effects was matched. The UCLA students played slightly more fairly than is the norm for US populations: their mean offer was 48 percent, they did not make low offers, and there were no rejections.

It is interesting to note that the Orma play closely parallels that of UCLA anthropology graduate students. The conditions that Henrich so carefully controlled for in the USA – higher stakes and small-scale community – are also represented in the Orma context, which could explain why one finds a closer parallel between the UCLA play and the Orma than between other US populations and the Orma. What is more, the qualitative feedback from both

studies indicates that the reasons for playing that way are similar for both the Orma and the UCLA anthropologists.

In my post-play interviews with players almost every player who offered 40 or 50 percent indicated that he/she did so because of fairness. In the formal interview immediately after the play, no one owned up to being strategic or fearing that a lesser offer would be rejected. Furthermore, virtually every responder indicated that he/she would have accepted an offer of even 10 percent, the lowest possible short of zero. While the fairness explanation was consistent with the willingness to accept low offers, I was still suspicious of proposers' motivations for giving high offers. I sought out a few reliable informants I knew I could trust to fill me in on 'the talk in the village'. This revealed that people were *obsessed* with the possibility that their offer might be refused, in spite of the fact that they thought (correctly) that it was unlikely that people would refuse even a small offer. But very few wanted to take such a chance. In short, I was told that their behavior was driven by risk aversion. Henrich (forthcoming) reports similar strategic thinking reflecting considerable risk aversion among the UCLA graduate students who feared there might be some people (albeit very few) out there who would reject any offer below 50 percent, and they did not want to miss their $80 (half of the $160 stake).

While we cannot differentiate fairness from strategic risk aversion in the ultimatum bargaining game, the dictator game does facilitate this disaggregation.

THE DICTATOR GAME

The dictator game is much like the ultimatum game except that the second player cannot refuse the offer. However the proposer chooses to divide the sum, is what each player receives.

The Orma mean offer for the dictator game was 31 percent (see Figure 13.2). While this is high for comparable experiments from the developed world, which range from 20–30 percent, it is not far out of bounds and is significantly lower than their offers of 44 percent in the ultimatum game. What is different in the Orma case is the distribution of offers. While it is common to find 30–40 percent of players taking all of the pot in the USA and Canada, one finds a much smaller percentage of purely self-interested players among the Orma (9 percent). The number playing for fairness, at 40–50 percent, is about the same for the Orma and US samples. Thus, while there are two modal strategies in the developed world – pure fairness and pure self-interest – there is less consensus among the Orma. In other words, behavior is not driven by a dominant norm or by two competing norms. The

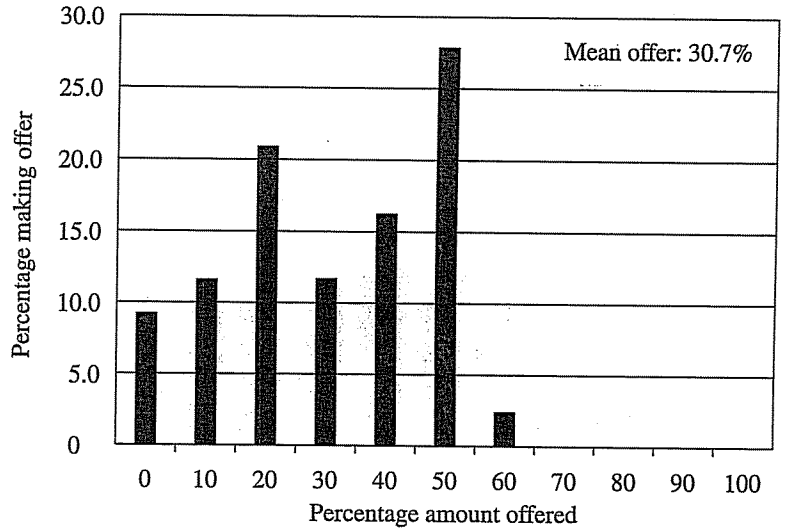

Figure 13.2 Dictator game (N = 43 pairs)

bulk of the distribution for the Orma falls between pure self-interest and pure fairness.

This observation begins to shed light on the notion of norms, which become much more interesting in the next two games.

THE TRUST GAME

The trust game is less well known than either the ultimatum or the dictator games. In this game the first player is offered a sum of money that he/she may keep or divide in any way with the second player. Whatever he/she offers to the second player is tripled by the experimenter, and then that player has the opportunity to make a return offer to the first player. Obviously, if the first player is trusting and the second player is trustworthy, both can take away one and a half times what player one alone would receive if he/she took it all and left nothing for the second player.

For the second player, the trustee, this is a dictator game influenced by the extent of obligation that the trustee feels to reciprocate. The Orma results are low relative to those reported for the USA, but clearly indicate far more trust than narrow rationality would predict. The Orma players offer 44 percent, while initial offers in the USA typically exceed 50 percent (see Figure 13.3).

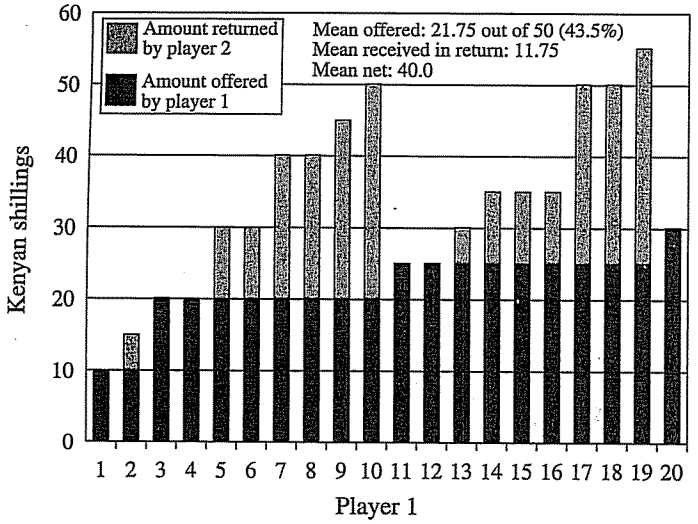

Figure 13.3 Trust game amount offered by player 1 and returns received (N = 20 pairs)

The more striking finding, however, is the behavior of the trustees. In Berg et al.'s US study (1995), the trustees were offered 52 percent and they returned 30 percent after the tripling, thus yielding the original player 90 percent of their original offer. Trust was not perfectly reciprocated, but nearly so. In the Orma case, the trustees were offered 44 percent and they returned only 18 percent after the tripling, yielding a return of only 54 percent on the trust (see Figure 13.4). In other words, the Orma are slightly on the low trusting end of the spectrum and they appear to have good reason to be less trusting. The most striking finding here is the relatively low level of reciprocity among the Orma compared to the USA. In this context, social capital would appear to be low.

These results are particularly striking because half of the trust games were carried out in a nomadic village and the other half in a relatively small sedentary village that has close ties to nomadic villages and no market center. Nomads have strict social norms governing the sharing of food. These norms no longer exist in the sedentary market villages, which are far larger, less subsistence oriented, less densely related and less interdependent. The conditions in these nomadic villages are exceedingly close to those fondly described in James Scott's *Moral Economy* (1976). I propose that evidence of food sharing neither reflects nor generalizes into universal norms of sharing or reciprocity, but rather that such norms function in a tightly controlled envi-

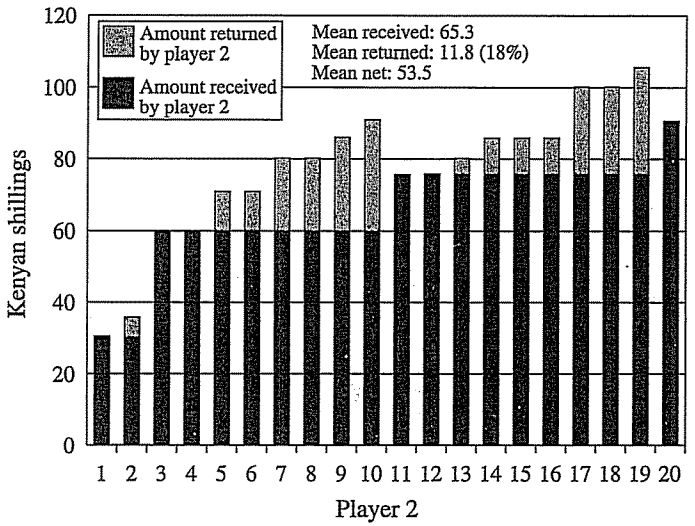

Figure 13.4 Trust game amount received and returned by player 2 (N = 20 pairs)

ronment with explicit rules and sanctions. In this context, the final game is instructive.

THE PUBLIC GOODS GAME

I ran a version of the public goods game with four players. Each is endowed with 50 shillings and given the opportunity to contribute any or all of it to a 'group project'. The sum of all their contributions is doubled by the experimenter and divided equally among all four players. All contributions are made privately in an envelope so that no one but the experimenter knows the amount of each contribution.

In the USA, contributions range in the neighborhood of 40–60 percent of the total (Ledyard 1995), obviously representing something of a free-rider problem, but not as strong a one as might be predicted. In light of the Orma's somewhat low relative level of trust in the previous game (44 percent initial offers versus 52 percent in the USA), it is interesting that their contributions to the public goods game are on the high end of the spectrum relative to the US population, coming in at 58 percent (see Figure 13.5). Furthermore, half of these games were played in the sedentary market villages, where sharing

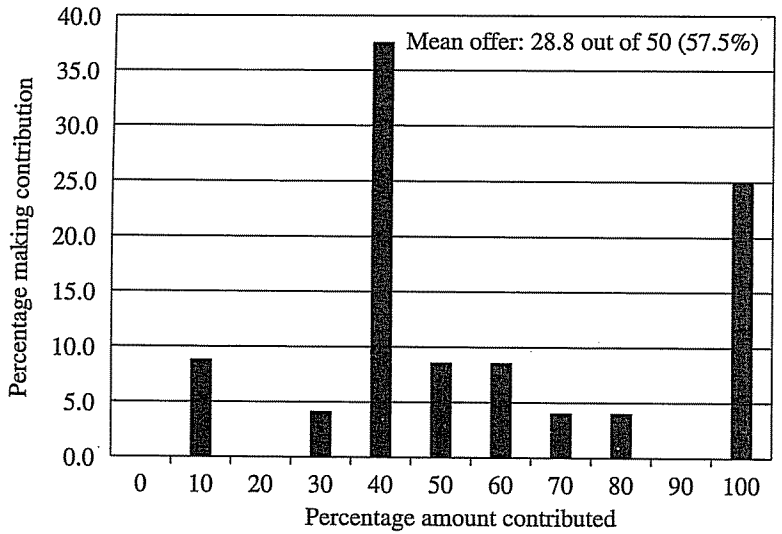

Figure 13.5 Public goods game with four players (N = 24)

and interdependence is less the norm than in the nomadic villages. If one assumes that both the trust and the public goods games involve the same principle, namely 'trust' of fellow players not to free ride, one should expect more consistent results. While the sample sizes involved here are too small to make any conclusive statements, they do provide evidence for speculation.

Once again, the ethnographic context is enlightening. When this game was first described to my research assistants, they immediately identified it as the '*harambee*' game, a Swahili word for the institution of village-level contributions for public goods projects such as building a school. The government of Kenya has for many years encouraged the formal use of *harambee* fundraising as a means of community development. This institution was not adopted by the Orma until relatively recently. As the Orma become more sedentary and value schooling at a time when the government can no longer afford to build schools, they have increasingly employed this institution. *Harambee* is much encouraged by the government, which provides receipt books and some oversight of accounts.[4] There was in fact a major *harambee* collection ongoing at the time of these games. Afterwards it as clearly evident from the comments of participants that many made the association between this game and the institution of *harambee*.

I suggest that the Orma were more willing to trust their fellow villages not to free ride in the public goods game because they associated it with a learned

and predictable institution. While the game had no punishment for free riding associated with it, the analogous institution with which they are familiar does. This I would argue, resulted in a spillover effect leading to higher contributions than were observed in the trust game (58 versus 44 percent). A social norm has been established over the years with strict enforcement that mandates what to do in exactly analogous situations. The same did not apply in the trust game. Although half of the trust game sample was made up of nomadic villagers who are both more closely related to one another and share a great deal more in their day-to-day life, the trust game did not trigger such a high level of trust, or a high level of return reciprocity even when trust had been extended. Nomads share according to rigid rules that, among other things, define exactly which shares of meat go to men and which to women. It appears that in the absence of clear guidelines defined by institutions and social norms, such trust and reciprocity is not taken for granted.

Although these results are not statistically meaningful with such small sample sizes, they do warrant a more careful second look. In follow-up research greater pains will also be taken to isolate exactly this effect, with attention to proper controls on potentially confounding variables such as income, gender and market orientation.

In a very recent paper, Ochenfels and Weimann (1999) present data from public goods and solidarity games played in East and West Germany. They find West Germans to be considerably more cooperative than East Germans, and make the case for culture-specific norms resulting from differing economic and social histories in the two parts of Germany. It is a fascinating cross-cultural case because so many often confounding variables are controlled for, namely, language, currency and the experimenters. The work is relevant to this discussion because it is also conceivable that the West Germans are more cooperative as a direct result of their experiences with formal institutional structures in much the same way that I am speculating about the Orma case.

CONCLUSIONS

My findings to date reinforce those of developed world studies, which find evidence of far more concern for fairness and less evidence of narrow economic self-interest, rationality and the free-rider problem than economic theory would predict. The Orma data, however, also demonstrate in many respects that members of this small-scale community are not *more* generous, more trusting, or more likely to share than US populations, thus challenging many moral economy notions of naturalistic sharing and cooperation in less-developed societies. This is also borne out cross-sectionally in the data in that

nomads are no more trusting than members of settled villages despite their ongoing norms of food sharing.

One intriguing interpretation of these findings is that the causal arrows often associated with theories of social capital might be reversed. Rather than viewing economic development as an outcome of an underlying generalized level of trust in a society backed by social norms and social networks, we may wish to look to the role of government institutions as the engine of higher levels of generalized trust and cooperation. If indeed further research turns up stronger trust and more fair-minded behavior among sedentarists than nomads, it could be a function of life in a more formally institutionalized environment. The same principle could explain the relatively-speaking greater levels of trust evidenced in developed societies versus the Orma. Much work remains to be done to determine exactly how much 'spillover' effect, if any, there is from institutional models such as the *harambee* example from Kenya. Experimental economics offers promise of a rigorous method for further exploration of this and other relationships in the arena of trust, cooperation and institutions.

NOTES

* The author is grateful for the constructive comments of seminar participants at the MacArthur Foundation Preferences Network, Yale University, and the University of Illinois at Champaign-Urbana, where this chapter has been presented. The author also wishes to thank the John D. and Catherine T. MacArthur Foundation for generous support of this research. While conducting research in Kenya the author was affiliated with the Institute for Development Studies at the University of Nairobi. Members of the Institute provided much encouragement and valued critique of this work in an informal seminar. Finally, the author also would like to thank the government of Kenya for granting research clearance for this project.

1. Findings from these cross-cultural studies will be presented in the fall of 1999 and published in a volume edited by Robert Boyd.
2. I have some anecdotal evidence that bears on the anonymity question. About a week after the play was finished in one large village I made inquiries about what people knew about how other people had played. I was told that while some had told their close friends how they had played, others had not. They discussed the games in a general sense, but did not reveal their actual offers. I was also approached by a very close friend approximately a week after his wife had played the dictator game. The friend was curious how his wife had played because, 'She won't tell me'. Finally, three women who played the dictator game and kept the entire pot for themselves were so proud of the fact that they immediately ran into the village and told their friends.
3. I had no choice but to lower the show-up fee from one-third to one-fifth of a day's wage due to the shortage of currency in the necessary denominations.
4. It should be noted that these highly localized *harambee* collections in which the Orma participate are largely free of the corruption that usually accompanies these efforts when they are conducted at the national level or cross-regionally.

REFERENCES

Berg, Joyce, John Dickhaut and Kevin McCabe (1995), 'Trust, reciprocity, and social history', *Games and Economic Behavior*, **10**, 122–42.

Camerer, Colin F. (n.d.), 'Simple bargaining and social utility: dictator, ultimatum, and trust games', in *Experiments in Strategic Interaction*, Unpublished book manuscript, ch. 3.

Henrich, Joseph (forthcoming June 2000), 'Does culture matter in economic behaviour: Ultimatum game bargaining among the Machiguenga', *American Economic Review*.

Ledyard, John O. (1995), 'Public goods: a survey of experimental research', in Alvin E. Roth (ed.), *The Handbook of Experimental Economics*, Princeton, NJ: Princeton University Press, pp. 111–194.

Ochenfels, Axel and Joachim Weimann (1999), 'Types and patterns: an experimental East–West–German comparison of cooperation and solidarity', *Journal of Public Economics*, **71**, 275–87.

Putnam, Robert D. (1993), *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton, NJ: Princeton University Press.

Roth, Alvin E., Vesna Prasnikar, Masahiro Okuno-Fujiwara and Shmuel Zamir (1991), 'Bargaining and market behavior in Jerusalem, Ljubljana, Pittsburgh and Tokyo: an experimental study', *American Economic Review*, **81**, 1068–95.

Scott, James (1976), *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia*, New Haven, CT: Yale University Press.