Foundations of Human Sociality: A Review Essay
Foundations of Human Sociality: Economic Experiments and Ethnographic Evidence from Fifteen Small-Scale Societies by Joseph Henrich; Robert Boyd; Samuel Bowles; Colin Camerer; Ernst Fehr; Herbert Gintis
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Foundations of Human Sociality: A Review Essay

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1. Introduction

The scientists and engineers at the University of Wisconsin have periodic open houses. Thousands of visitors “ooh” and “aah” at the gleaming equipment—nuclear reactors, particle accelerators, electron microscopes, wind tunnels—and sophisticated experiments—cloning, fusion reactions, artificial hearts, and so on. It is no wonder that people walk away anxious to give money. Economists could surely benefit from putting on a similar display, but what would we show?

Foundations of Human Sociality: Economic Experiments and Ethnographic Evidence from Fifteen Small-Scale Societies provides one answer.¹ It reports on a research program involving coordinated experiments in fifteen societies scattered around the world. This is a project as sophisticated as anything the scientists can produce. The fifteen societies are described in the title as “small-scale,” but this is an understatement. They are remote, they speak a variety of uncommon languages, and they live in circumstances that make even basic data collection difficult. They fit the stereotype of societies that would be studied by anthropologists, and the editors are joined in the project by a team of (primarily) anthropologists.

Three questions lie behind this book. First, experimental economists have amassed a wealth of data in recent years, featuring considerable consensus in some respects. The bulk of the subjects in these data are university students, often American university students. Could the relatively consistent data be an artifact of a homogeneous subject pool, with a world of unexplored variety lurking beyond? Second, a growing number of economists have explored models in which people are concerned with more than simply their own material well-being. How might we model such “social” preferences, and how might we use experimental data to bring some discipline to what otherwise looks like a game with no rules? Finally, having designed such a research program, what do the data have to say?

Reflecting these questions, the book splits into two parts. One of these is chapter 3, written by Colin Camerer and Ernst Fehr. This chapter lays out a program for the

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experimental investigation of social preferences, centered around a series of games that allows one to evaluate and refine hypotheses about preferences and their induced behavior. The second part, comprising the bulk of the book, includes chapter 2, written by the six coeditors and Richard McElreath, and chapters 4–14. The latter report the field work done with the fifteen small-scale societies, emphasizing the economic experiments. Chapter 2 ties the field work together with a description of the common elements as well as the inevitable differences.

2. Social Preferences: A Research Program

It will help organize the subsequent discussion to begin with the research program for studying social preferences outlined in chapter 3. Some terms will be helpful. Let us say that an agent’s preferences are personal if they depend only on the amount of money the agent receives. If not, then they are social. An agent’s social preferences can in turn be substantive, in which case they depend only upon the final allocation of (perhaps everyone’s) monetary payoffs, or can be procedural, in which case they also depend upon aspects of the process by which these payoffs were determined.

The book offers a useful example of substantive social preferences, taken from Fehr and Klaus M. Schmidt (1999) (see Gary E. Bolton and Axel Ockenfels 2000 for a similar model). The utility $u_i(\pi_i, \pi_j)$ derived by player $i$ from $i$’s monetary payoff $\pi_i$ and $j$’s monetary payoff $\pi_j$ is given by

$$u_i(\pi_i, \pi_j) = \begin{cases} \pi_i - \alpha_i(\pi_j - \pi_i) & \text{if } \pi_i \leq \pi_j \\ \pi_i - \beta_i(\pi_j - \pi_i) & \text{if } \pi_i > \pi_j \end{cases}$$

where $0 \leq \beta_i < \alpha_i$ and $\beta_i \leq 1$. The special case of $\alpha = \beta = 0$ gives personal preferences. When $\alpha$ and $\beta$ are positive, player $i$ still likes high monetary payoffs, but now is also averse to inequality, being especially unhappy with inequality in which she receives the short end of the stick.

Chapter 3 notes that either substantive or procedural preferences are consistent with behavior observed in the experiments discussed in the chapter. However, the authors suggest that procedural preferences provide better descriptions of behavior in other experiments. In light of these remarks, it would have been helpful for the chapter to present an example of procedural preferences analogous to (1), and to have the experimental results discussed in this chapter explained in terms of this model.

The research described in this chapter is centered around a series of five games that have played prominent roles in the experimental literature:

**The prisoners’ dilemma.** The point of departure is the prisoners’ dilemma. For example, they refer (p. 83) to an “increasing number of experiments that compare predictions of competing theories,” providing “clear evidence for reciprocity beyond inequality aversion…”

The chapter refers the reader to Matthew Rabin (1993) as well as other models.

The authors include two additional games, a public goods game that gives rise to incentives analogous to those of the prisoners’ dilemma, and a gift exchange game that gives rise to incentives analogous to those of the trust game.

An example of a prisoners’ dilemma is:

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The key characteristics are that defection (D) is a dominant strategy, while mutual cooperation (C) yields a superior outcome.
Personal preferences yield an unambiguous prediction, namely that players should invariably defect. Instead, laboratory experiments routinely find that some agents defect but others cooperate. There are manipulations of the experimental environment that make cooperation less frequent, but there is no experimental treatment that reliably produces universal defection.

If we are to account for this behavior while retaining the organizing principle of economics, namely that rational players make optimal choices guided by well-defined and stable preferences, then we must admit the possibility of social preferences: some people prefer to cooperate in the prisoners' dilemma. In terms of (1), we thus have evidence that for at least some players, $\beta > 0$. For cooperation to be optimal, however, an individual must not only have a sufficiently large value of $\beta$, but must also think the opponent is sufficiently likely to cooperate. Are those that defect characterized by small values of $\beta$, or are they simply pessimistic about the prospects that their opponents will cooperate, while standing ready to cooperate against sufficiently cooperative opponents?

The ultimatum game. In response, attention turns to the ultimatum game. Personal preferences, coupled with subgame perfection, call for player 1 to offer player 2 nothing (or at most the smallest possible positive amount) and for player 2 to accept. Conditional on player 2 always accepting, player 1’s choices should provide a window into 1’s value of $\beta$. Larger values of $\beta$ correspond to larger offers to player 2.

In experiments, player 1 often offers a substantial portion of the money to player 2, while player 2 often rejects smaller offers. The latter behavior provides evidence that $\alpha > 0$ for some players, so that an equal outcome of no money for both is preferred to receiving a relatively small amount of money. However, this player-2 behavior obscures the lessons concerning player 1’s value of $\beta$. Does player 1 offer money to player 2 because 1 prefers not to have too unequally large a share, or because player 2 rejects small offers?

The dictator game. To answer this question, the authors direct attention to the dictator game. Personal preferences call for player 1 to retain all of the money. However, player 1 typically offers some money to player 2, but less than in the ultimatum game (Roth 1995). The positive offers again provide evidence for positive values of $\beta$, but the comparison suggests that 1’s behavior in the ultimatum game is a mixture of concerns for player 2’s payoff and concerns about being rejected.

The trust game. Attention next turns to the trust game. Personal preferences, again coupled with subgame perfection, call for player 1 to retain everything, sacrificing the efficiency gains of making a contribution to player 2. Experimental findings, with significant variation, are that player 1 typically contributes about half of 1’s endowment to 2, who returns a sum leaving player 1 slightly worse off than if 1 had contributed nothing.

Given that player 1’s behavior reflects a mixture of preferences and expectations about 2’s behavior, as in the ultimatum game, the clearest implications for preferences

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8 See John O. Ledyard 1995 for a survey.
9 The inequality $\beta > 0$ is necessary for $C$ to be preferred to $D$. The interpretation is that such an agent prefers the more equal (but personally less lucrative) outcome of mutual cooperation to the more asymmetric payoffs produced by defecting against a cooperator.
10 Player 1 proposes a division of a sum of money to player 2, who either accepts the division, in which case it is implemented, or rejects it, in which case both receive nothing.
12 Player 1 divides a sum of money between player 1 and 2.
13 Player 1 and 2 each receive an endowment of S. Player 1 first decides how much of S to give to player 2, retaining the rest. The money given to player 2 is tripled, at which point player 2 decides how much money to return to player 1.
come from player 2's behavior. The fact that player 2 returns anything at all provides more evidence that β > 0. However, the data pose puzzles for both substantive and procedural preferences. Player 2 fills the position of a dictator, with the amount to be divided depending upon player 1's first move. In this dictator portion of the trust game, the final payoff typically allocated to player 1 does not increase as the amount to be divided increases. One might have expected preferences such as those captured by (1) to call for the player 1's payoff to increase. Perhaps the answer is that procedural considerations are important here. The second move in a trust game is not a de novo dictator game, but a game that follows a choice on the part of player 1 that affects player 2's preferences. The difficulty here is that as player 1 contributes more, and hence acts so as to enhance the welfare of player 2, player 2 "reciprocates" with actions that decrease player 1's relative payoff, leaving player 1 no better off and appearing to put increasing emphasis on player 2's payoffs. This is an unusual brand of reciprocity.

The trust game illustrates how subtle the match between experimental results and simple economic models can be. In light of this, a more detailed discussion would have been helpful, including a demonstration of how the substantive model given by (1) and an analogous procedural model might match behavior.

**Punishment games.** People may have social preferences, but are the departures from personal preferences large enough to have real effects on behavior? The point behind the punishment games described briefly in this chapter is that seemingly small effects in preferences can be leveraged into large effects in behavior. Suppose that there is an accepted standard of behavior, and that people have the opportunity to sanction those who stray from this standard. These sanctions may have a large cumulative effect on their target while imposing relatively small costs on those doing the sanctioning. Experiments show that people will impose such sanctions, even against those whose actions have no direct payoff consequences for the sanctioner, and that the sanctions can have significant effects on behavior (Fehr and Urs Fischbacher 2004, Fehr and Simon Gächter 2000, 2000, 2002).

3. The Experiments

Chapter 3 offers a template for the study of social preferences. The second and larger part of the book pursues this program, reporting on experiments with fifteen groups of people. The following table identifies the groups with whom the experiments were done, their location, and the researchers who did the experiments and wrote the relevant chapters.

Every study involved the ultimatum game. In some cases, experiments with one or more of the public-goods game, the trust game, or the dictator game were also performed. The most striking aspect of the experimental work is the chance to compare ultimatum-game behavior across a wide range of settings, and I’ll concentrate on the ultimatum game.

The authors organize their results around five themes.

**Variability.** The behavior observed in the fifteen societies exhibits more variation than found in the familiar experimental literature based on university students. Mean offers in ultimatum-game experiments with university students tend to lie between 40 and 50 percent. Among the fifteen societies studied here, the means range from 25 to 57 percent. Most existing experiments have produced modes at 50 percent, while modal offers here range from 15 to 50.

Rejection behavior is similarly varied. Four groups (Kazaks, Ache, Quichua, and

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14 The preferences given by (1) are linear in payoffs, as is the feasible set facing player 2. Taken literally, (1) then implies that player 2 should (generically) either return none of the money or equalize payoffs, but generalizations give interior solutions.
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<td>12</td>
<td>Orma</td>
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<td>13</td>
<td>Ache</td>
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Tsimane') rejected no offers (with sample sizes from 10 to 70), even though in two of these cases about half of the offers were for less than 30 percent of the surplus. Another group (Machiguenga) rejected only one offer (out of 21), though 75 percent of the offers were for less than 30 percent of the surplus. Two of the groups (Au and Gnau) often rejected offers of more than fifty percent, and appeared to be just as likely to reject high as low offers. In other groups, rejections were relatively frequent, especially of low offers.

Preferences. The prediction of subgame perfection with personal preferences, that the proposer offers virtually nothing and the responder accepts, does not provide a good match for the data. As one might expect, given the variability in behavior, there are aspects of the data that appear to be both closer to and further from this benchmark than the bulk of the existing literature.

Intergroup differences. The authors construct measures of two characteristics for each group. A group is deemed to have higher potential gains from cooperation if productive activities in the group are more likely to require interaction with nonrelatives. A group is deemed to have higher aggregate market integration the more often its people engage in market exchange, the larger its settlements, and the more complex its political structure. A regression suggests that mean ultimatum-game offers are higher for those groups exhibiting a higher potential benefit from cooperation and higher aggregate market interaction.\(^{15}\)

These results nicely exploit the strength of the research design and data, namely the variability in groups and behavior. At this point, it would be helpful to have more attention devoted to how one might interpret the link between aggregate market integration and ultimatum-game behavior. If asked for the direction of this link before seeing this book, I'm not sure which I would have predicted. I can imagine market

\(^{15}\) A standard deviation increase in either variable gives about half a standard deviation increase in mean offer.
integration making people more likely to treat others ‘fairly’ or more likely to induce them to drive and sometimes accept hard bargains. Some additional scrutiny and perhaps modeling would be helpful in interpreting the correlation.

**Intragroup differences.** A variety of individual characteristics, such as sex, age, wealth, education, market participation, and others, showed little relationship to behavior in the experiments.

**Everyday life.** The authors note that one can find parallels between the behavior of various groups in the experiments and their everyday life. For example, foragers who routinely share the meat they catch (the Ache), to the point that a successful hunter often takes none of the catch, sometimes declining even the credit for making the catch by leaving it outside the village to be found anonymously, made quite generous offers in the ultimatum game and generated no rejections. Foragers who appear to share only under duress (the Hadza), often attempting to sneak their catch into camp unseen, made smaller offers that often generated rejections.

The links between everyday and experimental behavior are especially intriguing. First, they suggest a view of preferences as being shaped by one’s culture and way of life, a suggestion that runs throughout the book. Among the clearer examples, John Patton (pp. 121–22) suggests that the Achuar tend to be involved in more stable interactions in their daily lives than do the Quichua, which may be reflected in different perceptions of what behavior is fair or acceptable, and hence different behavior in the ultimatum game. Richard McElreath (pp. 350–51) offers a similar explanation for behavioral differences between Sangu herders and farmers. Michael Gurven (p. 227) closes his discussion with a call for further investigation of such cultural foundations of social preferences.

At the same time, this link raises issues in interpreting the experimental results. For example, the Orma are said (pp. 38–41) to have readily recognized the public goods game as a “harambee” game, referring to the contributions they make when constructing public goods such as roads or schools. However, the harambee itself appears to be best modeled as a repeated relationship, unlike the one-shot nature of the experiment. If subjects responded to the experiment with behavior appropriate for the repeated environment of the harambee, then their behavior may tell us little about their preferences. We return to this issue in the following section.

The experiments provide a wealth of material for those interested in studying experimental methods. How does one attempt standardized experiments when dealing with twelve researchers in fifteen societies spread across the globe in challenging settings? As the authors note, a variety of compromises had to be made. Some actual ultimatum-game offers were supplemented with sham offers to generate more variation. Some sample sizes were small. The game was typically presented in the abstract, but sometimes with the help of analogies to concrete situations. Subjects were typically paid in money, but not always. How does one control the variation inevitable in oral presentations? How does one ensure that the various settings have not introduced framing effects that swamp other considerations? How does one work, not only without the sophisticated computer interfaces typical of experimental laboratories, but with subjects who may not be able to do even simple arithmetic?

The authors are aware of these difficulties. I think it a sensible response to note that if one waited for perfect procedures and perfect answers to all of these questions, no study

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16 Jean Ensminger’s contribution (pp. 356–357) provides a brief discussion of ideas suggesting that market participation may either enhance or attenuate tendencies to be fair.

17 Henrich (2004) presents a model in which cultural evolutionary shapes social preferences.
of this type would ever get off the ground. It is clear from the recurring discussions of method in the book that the authors worked hard in quest of the best experimental practice they could achieve, and worked hard to control and standardize their procedures. This is as much as one can ask.

4. Discussion

The book provides clear answers, sketched in the previous two sections, to the first two motivating questions raised in section 1. There are ways to systematically use experiments in investigating social preferences. There is more variety in behavior than previous experiments might lead us to believe. The third question is more challenging. What do the results tell us about the nature of people's social preferences? Using (1) to organize the discussion, what do the experiments tell us about people's values of $\alpha$ and $\beta$? In particular, do the experimental observations imply that we should rethink our economic models, in which personal preferences currently play a prominent role, to allow more room for social preferences?

The answer appears to be yes, if the games played by the subjects are a good match for the ultimatum game that appears in our theoretical models. This qualification, however, is important. A key feature of the ultimatum game is that it involves anonymous opponents with no future interaction. If the participants are concerned with the implications of current play for future behavior, perhaps in the form of an effect of current play on their reputation, then the simple link between behavior in the ultimatum game and preferences is broken.

How might such a concern with the future or a feeling of nonanonymity arise? The subjects in the experiments reported here are typically drawn from small societies, with whom they know they will have subsequent interactions, often while living with virtually no privacy. Despite the best attempts of the experimenter to make experimental play anonymous, the subjects may have perceived, perhaps correctly, that their current play would have future repercussions.\(^{18}\) This possibility is raised several times in the book. Gurven (p. 221) suggests that rejections in the ultimatum game may have been relatively rare because subjects viewed rejection as giving rise to costs or punishments in subsequent interactions. Ensminger (p. 358) notes that anonymity may be impossible to achieve in small-scale societies. Hill and Gurven suggest (p. 403) that their subjects live in a sufficiently small community that aggressive behavior in the game could be deterred by the attendant negative impact on subsequent community relations, and note (pp. 406-07) that subjects appeared to treat the public goods games as part of an iterated sequence of social interactions.

These difficulties are exacerbated by the challenges of getting the experimental subjects to understand the abstract experimental environment. Patton (p. 105) indicates that the experiment was described to the potential subjects as a minga, or cooperative labor exchange. This may have helped in many respects, but a minga entails future obligations (p. 101), potentially introducing the ideas of repetition or lack of anonymity into subjects' views of the experiment. As we have noted, Ensminger (p. 376) reports that her subjects immediately recognized the public goods game as a harambee, a village-level public goods contribution process that again potentially introduces elements of repetition or the lack of anonymity.

It does not appear as if one can explain all of the data by simply muttering "they acted

\(^{18}\) Notice that this possibility differs from a maladaptation account, in which evolution is said to have neglected to equip us even with an understanding of one-shot interactions (because we purportedly evolved in an environment in which the norm was repeated interactions with small groups of primarily relatives). Fehr and Henrich (2003) and Henrich (2004) argue that such maladaptation does not provide an adequate model of social preferences. Instead, we are considering here the possibility that subjects may understand the implications of one-shot interactions, but not view the experiments as such interactions.
as if the game was repeated. However, as various of the authors' comments indicate, the possibility that such considerations played a role in shaping play is heightened by the nature of the subject populations, and makes it difficult to identify the games and the forces that shaped the subjects' behavior. This in turn makes it difficult to draw inferences about the values of \( \alpha \) and \( \beta \) from the observed behavior.

Why is this a problem? Everyone recognizes that people sometimes do things—make anonymous contributions, render aid to strangers, chastise transgressors—that are most readily modeled with social preferences. Differences of opinion arise in assessing the importance of social preferences in explaining economic behavior, and it is here that experiments can be especially valuable. But if the behavior in the experiments depends importantly on features beyond the experimental design, then conclusions concerning the nature and importance of social preferences are difficult to draw.

This difficulty becomes more pronounced if we consider procedural preferences rather than the substantive preferences of (1). Not only are outcomes now important, but so is the process by which these outcomes are achieved. In addition, we cannot expect the experiment to control all of the details of this process. For example, Gurven (p. 226) notes that preferences for how resources are to be allocated may depend importantly on how the resources are made available—whether as the result of a windfall, for example, or as a result of having been earned. How do the experimental subjects perceive the surplus, and what effect does it have on their behavior? Preferences now depend upon the game and the context in which the game is played.

The experiment can control the former, but we can expect much of the latter to be supplied by the subjects.

A recurring theme throughout this book is that behavior in the experiments reflects the subjects' behavior in their everyday lives, as one would hope if the experiments are to tell us about the preferences that guide the subjects' lives. However, running along with this is the theme that the experimental behavior may be borrowed from a variety of real-life situations, not all of them an appropriate match for the setting one typically hopes to capture with the ultimatum game. Henrich and Smith (p. 164) suggest that behavior in the ultimatum game depends upon which of a diverse set of behavioral rules is triggered by the experimental implementation. McElreath (p. 344) suggests that different players may map the ultimatum game into different social experiences and hence effectively play different games. Patton (p. 98) suggests that ultimatum-game behavior reflects a logic of reciprocal fairness that is not well suited for the ultimatum game, but also not easily overruled by a conscious understanding of the game. Tracer (p. 255) suggests that his players "inescapably brought the understandings, beliefs, expectations, and values that they apply to daily life into the experiment," including a belief that current actions would incur future obligations. Hill and Gurven (p. 403) offer a similar interpretation. Gurven (p. 226) notes that people can be more or less likely to cooperate depending upon the type of cooperation required—a group may readily cooperate in hunting or fishing, but not in conservation—making it difficult to make the link from experimental behavior to any particular real-life behavior.

We thus have two related obstacles standing between the observed behavior and conclusions about social preferences. First, the subjects may have viewed their behavior as having future implications. If so, then subjects with personal preferences could exhibit behavior that could only be rationalized by

19 Ensminger follows her comment with the observation that something more appears to be at work. Hill and Gurven note that the shadow of the future was most pronounced in a version of the public goods game in which contributions were made publicly, an indication that subjects understand that the future is sometimes more important than others.
social preferences in a literal implementation of the ultimatum game. Second, social preferences, especially procedural social preferences, may call into play a variety of factors beyond those captured by the ultimatum game model and the surrounding experimental design. Distinguishing between personal and social preferences is thus not straightforward.

These difficulties are not new. The existing experimental literature is full of experiments that are interpreted by some as being consistent with social preferences and others as reflecting personal preferences, with the differences frequently revolving around the connection between the experimenter's model of the strategic interaction and the subjects' model of the interaction. Indeed, this diversity of interpretations and conclusions is reflected in miniature in the studies in this volume.20 One can conclude that the experimental findings in this volume are consistent with a model in which social elements play an important role in people's preferences and behavior, but also that they are consistent with a model in which behavior is guided primarily by personal preferences.

Further work is required to distinguish these alternatives. Work that moves us outside the traditional experimental economics laboratory, like the experiments reported here, is likely to be especially useful. In this respect, perhaps the most valuable part of this book is its analysis linking experimental play to group characteristics such as the importance of cooperation and degree of market integration. Once again, the results lend themselves to multiple interpretations. It could be that cultural evolution has led different groups to different configurations of social preferences that reflect differences in their ways of life. It could also be that subjects from different groups associate the experiment with different experiences from their contrasting ways of life, prompting different behavior from personal preferences.

Comparative static studies of this kind are likely to hold the key to separating the various hypotheses and getting a better idea of preferences.21 A single study cannot be expected to resolve every question, even a study as large as this one. But it has enriched the discussion and opened new directions for research, directions that hold great promise and that one hopes become standard.

5. Conclusion

This is a fascinating book to read on many levels. It provides a captivating window into the world of anthropologists.22 It is impressive both in the goals the authors are willing to set for an experimental study and in the lengths they are willing to go in pursuit of these goals.

We have much to learn from these experiments, most notably that humans exhibit a richer variety of behavior than many of us have imagined. The authors indicate they are working on additional experiments that will allow them to make use of what they have learned in this study and to fill in some more pieces of the puzzle. Readers of this book will surely look forward to the next.

REFERENCES

Fehr, Ernst, and Urs Fischbacher. 2004. "Third Party

21 Truman F. Bewley (1999) offers another promising direction for such work, seeking evidence that considerations such as fairness and morale play a role in workplace behavior, as does the growing body of work with field experiments (cf. Glenn W. Harrison and John A. List 2004). It may be useful to pursue experiments analogous to those of this book with larger societies in which anonymity may be more readily obtained.

22 The introduction briefly mentions a dinner in which the anthropologists on this project entertained the economists with stories of what the former had eaten in the field. The book is less graphic, but no less interesting in describing how work in economics and anthropology can be combined.


