Economic man – or straw man?

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Abstract: The target article by Henrich et al. describes some economic experiments carried out in fifteen small-scale societies. The results are broadly supportive of an approach to understanding social norms that is commonplace among game theorists. It is therefore perverse that the rhetorical part of the paper should be devoted largely to claiming that "economic man" is an experimental failure that needs to be replaced by an alternative paradigm. This brief commentary contests the paper's caricature of economic theory, and offers a small sample of the enormous volume of experimental data that would need to be overturned before "economic man" could be junked.

Henrich et al.'s paper "'Economic man' in cross-cultural perspective" is a summary of work described at greater length in the book *Foundations of Human Sociality* (Henrich et al. 2004). Both works describe some economic experiments carried out among fifteen small-scale societies all round the world. The experimental results are broadly supportive of an approach to understanding social norms that is commonplace among game theorists (Binmore 2005, pp. 57–92; Binmore & Samuelson 1994). It is therefore perverse that the rhetorical part of both works should largely be devoted to claiming that "economic man" is an experimental failure that needs to be replaced by an alternative paradigm. This commentary is an attempt to set the record straight. A longer commentary appears as http://else.econ.ucl.ac.uk/newweb/papers/economicman.pdf.

Homo economicus. It is not true that "texbook predictions" based on *Homo economicus* incorporate a "selfishness axiom." Orthodox economic theory only requires that people behave consistently. It is then shown that they will then necessarily behave *as though* maximizing something. Economists call this something *utility*, but they emphatically do not argue that people have little utility generators in their heads. Still less do they make it axiomatic that utility is the same as income. The mainstream view is that the extent to which human beings can be modeled as "income maximizers" is an empirical question.

Backward induction. It is not true that the backward induction argument that Henrich et al. use in analyzing the Ultimatum Game follows from the hypothesis that both players know that the other is an "income maximizer". One can arguably deduce that the outcome of a game will necessarily be a Nash equilibrium from this hypothesis, but the Ultimatum Game has many Nash equilibria. In fact, any division whatsoever of the available money is a Nash equilibrium outcome.

Mainstream experimental economics. As far as I know, nobody defends income maximization as an explanatory hypothesis in experiments with inexperienced subjects of the type conducted by Henrich et al. However, there is a huge literature which shows that adequately rewarded laboratory subjects learn to play income-maximizing Nash equilibria in a wide variety of games – provided they have gained sufficient experience of the game and the way that other subjects play.

It is true that there are anomalous games in which this standard result does not seem to apply in any simple way. In referring to the experimental work on such unusual games, Henrich et al. are entitled to claim that: "Initial skepticism about such experimental evidence has waned as subsequent studies involving high stakes and ample opportunity for learning has repeatedly failed to modify these fundamental conclusions" (target article, sect. 1, para. 1). But even their own Public Goods Game does not fall into this category.

Public Goods Game. The Prisoners' Dilemma is the most famous example of a Public Goods game. The essence of such games is that each player can privately make a contribution to a notional public good. The sum of contributions is then increased by a substantial amount and the result redistributed to all the players. In such games, it is optimal for a selfish player to "free ride" by contributing nothing, thereby pocketing his share of the benefit provided by the contributions of the other players without making any contribution himself.

Henrich et al. tell us that students in such Public Goods games contribute a mean amount of between 40% and 60% of the total possible, but that this "fairly robust" conclusion is "sensitive to the costs of cooperation and repeated play" (sect. 2.2, para. 2). In fact, the standard result is exemplified by the first ten trials of an experiment of Fehr (the fifth co-author of the target article) and Gächter (Fehr & Gächter 2000a) illustrated in Figure 3.2 of Henrich et al. (2004). After playing repeatedly (against a new opponent each time), about 90% of subjects end up free riding. One can disrupt the march towards free riding in various ways, but when active intervention ceases, the march resumes. The huge number of experimental studies available in the early nineties was surveyed by John Ledyard (1995) and David Sally (1995), the former for Kagel and Roth's (1995) authoritative *Handbook of Experimental Economics*. Camerer (co-author number four) endorses their conclusions in his recent *Behavioral Game Theory* (Camerer 2003, p. 46).

Social norms. I emphasize the standard results in Public Goods games because the orthodox view among mainstream economists and game theorists who take an interest in experimental results is not that the learning or trial-and-error adjustment that might take place during repeated play (against a new opponent each time) in the laboratory is a secondary phenomenon to which conclusions may or may not be sensitive. On the contrary, the fact that laboratory subjects commonly adapt their behavior to the game they are playing as they gain experience is entirely central to our position.

But what do subjects adapt their behavior from? Our view is that one must expect to see subjects begin by using whatever social norm is cued by the framing of the experiment in which they are asked to participate. And this seems to be broadly what happens. As Jean Ensminger (the tenth co-author of the target article) writes (in Henrich et al. 2004) when speculating on why the Orma contributed generously in her Public Goods Game:

> 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. I suggest that the Orma were more willing to trust their fellow villagers 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. A social norm had been established over the years with strict enforcement that mandates what to do in an exactly analogous situation. It is possible that this institution "cued" a particular behavior in this game. (Henrich et al. 2004, p. 376)

As Ensminger's reference to punishment suggests, the likely reason that this social norm survives in everyday life is that it coordinates behavior on a Nash equilibrium of the *repeated* game of life that the Orma play among themselves – a view that would seem close to that proposed elsewhere by Boyd (co-author number two) (see Boyd & Richerson 1985).

Ultimatum Game. Why is the Ultimatum Game anomalous? An explanation that is consistent with mainstream thinking depends on the fact that the game has large numbers of Nash equilibria. If an adjustment process ever gets close to one of these Nash equilibria, it is likely to stay nearby for a long time – perhaps forever (Binmore et al. 1995). For this reason, the game is very unsuitable for testing whether experienced subjects behave as though they were maximizing their income. The Prisoners' Dilemma has only one Nash equilibrium, and so it is very suitable for testing the income-maximizing hypothesis. It was at one time the chief standby of those who wish to discredit mainstream economics, but ceased to be popular for this purpose after it no longer became possible to deny that experienced subjects mostly play the game as though they were maximizing their income.

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Conclusion. The fine anthropological work reported in Henrich et al. (2004; and target article) is at variance with the rhetoric with which it is introduced. Please do not throw away game theory and other approaches associated with "economic man." The ideas that motivate the folk theorem of repeated game theory remain our best hope of understanding how societies hold together and adapt to new challenges.

A cross-species perspective on the selfishness axiom

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Abstract: Henrich et al. describe an innovative research program investigating cross-cultural differences in the selfishness axiom (in economic games) in humans, yet humans are not the only species to show such variation. Chimpanzees and capuchin monkeys show signs of deviating from the standard self-interest paradigm in experimental settings by refusing to take foods that are less valuable than those earned by conspecifics, indicating that they, too, may pay attention to relative gains. However, it is less clear whether these species also show the other-regarding preferences seen in humans.

It is assumed, both explicitly and implicitly, that animals (including humans) attempt to maximize their own self interest. After all, this is fundamental to natural selection and many behaviors are demonstrably motivated by self-interest. In some areas of economics, this has been translated into an assumption that a truly self-regarding person would accept any offer that was positive, as, for instance, in the Ultimatum Game discussed in the target article. However, as Henrich et al. note, people from a variety of cultures appear more interested in relative than absolute benefits, indicating that interest in fairness is a universal human characteristic. Recent research has shown that two species of nonhuman primates, capuchin monkeys (*Cebus apella*) and chimpanzees (*Pan troglodytes*), may behave similarly. These primates will refuse previously acceptable rewards if their rewards differ from those of a companion (Brosnan & de Waal 2003; Brosnan et al. 2005), indicating that they are more interested in their *relative* benefit in comparison with a conspecific partner than in absolute benefits. This is similar to the logic explaining people's reactions to the Ultimatum Game and provides a beginning for the exploration of a "sense of fairness" in nonhuman species (Brosnan, in press).

Moreover, as with people from different cultures, chimpanzees show great variation in the level of response dependent upon the social group from which they originated. (Bear in mind that this variation may or may not be based on the same sorts of cultural or socioecological factors as it is in humans.) These differences are not based on the sex or the rank of the individual, nor relatedness, as all subjects tested were adults paired with nonkin. Chimpanzees from a social group in which virtually all of the individuals grew up together, showed virtually no reaction to inequity, while those in a more newly formed social group responded relatively strongly. Psychology research has shown that people respond very differently to inequity when in close or positive relationships than when in distant or negative ones (Clark & Grote 2003; Loewenstein et al. 1989), and perhaps nonhumans react similarly. Chimpanzees that grew up together may have intimate, kin-like relationships and hence respond to relative inequity quite differently than chimpanzees introduced to each other as adults.

Although nonhumans apparently react to inequity, and this reaction may be impacted by the social environment of the individual, the results do not perfectly mirror those of humans. This is in part because of experimental constraints (the primates did not have anonymous interactions, nor were they allowed to choose the reward distribution themselves), and in part because it is unclear how to compare these chimpanzee groups to human sociopolitical groups. Regarding the former, in a follow-up experiment with capuchin monkeys, individuals were paired with a group mate to solve a mutualistic cooperation task for two rewards. Rewards were sometimes the same and sometimes different (one better than the other). Pairs that were more equitable in the division of rewards in the unequal condition were far more successful in all situations than those in which one individual dominated the better rewards (Brosnan et al., submitted). While this is not a perfect match for games such as the Ultimatum Game, it indicates that monkeys do pay attention to their partner's actions in determining reward division. They may "reject" a partner who is not generous, perhaps by simply failing to cooperate, and "reward" a generous partner with continued cooperation (see also de Waal & Davis 2003). Regarding the latter constraint (comparing human and chimpanzee groups), male chimpanzees in particular may need to cooperate frequently for territory defense and hunting, indicating that, as with some human societies, these individuals should have an interest in fairness and, perhaps, display other-regarding preferences.

We know that some nonhuman primates react to being relatively underbenefitted compared to a conspecific, which is irrational according to a strict self-interest paradigm. However, due to factors such as the primates being unable to determine the distribution of resources (excepting in the Brosnan et al. [submitted] study mentioned above), this research cannot compare partner response directly to any of the games discussed in Henrich et al's target article, nor can we effectively comment on the potential for other-regarding preferences in chimpanzees or capuchin monkeys. However, one bit of evidence indicates that these primates may be less other-regarding than humans are. In the experimental setup for the exchange tests, the primates were able to share food with each other if they so chose. However, there was virtually no sharing between the privileged individual and their less well-endowed partner (no instances in capuchin monkeys and less that 1% of interaction in the chimpanzees). Both of these species are known to be good food sharers and, indeed, we saw some sharing in the other direction (the privileged individual consuming the less valuable food). Previous research has indicated far greater levels of food sharing. It is interesting, therefore, that the relatively benefited individuals did not exert more effort to equalize rewards.

Studying such behaviors in nonhuman species may be an excellent way to further our knowledge of the selfishness axiom and other-regarding behavior. Not only do nonhuman primates provide a possible glimpse of the evolutionary trajectory of these behaviors, but investigation of their behavior may give us a greater insight into our own behavior. Other socially complex food-sharing species, such as the social carnivores, may display similar tendencies and provide further insight (e.g., Bekoff 2004).

On the limitations of quasi-experiments

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Abstract: Although provocative, the data reported in Henrich et al.'s target article suffer from limitations, including the fact that the "selfishness axiom" is not an interesting null hypothesis, and the intrinsic limitations of quasi-experimental designs, in which random assignment is impossible. True experiments, in the laboratory or in the field, will continue to be crucial for settling core issues associated with human economic behavior.

The wealth of data reported in the target article is a welcome addition to the study of economic behavior, which has, with impor-

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