Economic models are not evolutionary models

Roger J. Sullivan and Henry F. Lyle, III

Department of Anthropology, California State University, Sacramento, Sacramento, CA 95819-6106. **sullivar@csus.edu** **lyle@csus.edu**
www.csus.edu/indiv/s/sullivanr

Abstract: Henrich et al. reject the "selfishness axiom" within a narrowly-defined *economic* model, and are premature in claiming that they have demonstrated cross-cultural variability in "selfishness" as defined in broader *evolutionary* theory. We also question whether a key experimental condition, anonymity, can be maintained in the small, cohesive, social groupings employed in the study.

The authors of the target article are to be commended for successfully executing a complex study and generating much-needed data on human cooperation in cross-cultural contexts. They have used an economic model to test an evolutionary problem – are rules of cooperation between non-kin universal or particular? Our main problem with the article is that it never explicates the difference between an economic and evolutionary model – a test of the canonical economic "selfishness axiom" becomes an unexplicated test of Trivers' (1971) assertion that apparently altruistic acts are ultimately self-interested. This lack of definition leads to problems in the very first paragraph in which the authors point out that participants in experimental economic games "care about fairness and reciprocity" (target article, sect. 1, para. 1). Although concerns with fairness and reciprocity are a problem for the economic "selfishness axiom" – which predicts that people should be narrowly concerned with immediate selfish returns – they are anticipated by a broader evolutionary theory of reciprocity. Trivers (1971) and, more recently, Bshary and Schäffer (2002) use the example of symbiosis between reef cleaner fish and their hosts to demonstrate that social animals should be both selfish *and* concerned with fairness and reciprocity. In this example of between-species cooperation, various species of host fish are kept free of parasites and the cleaner wrasses benefit from a food source. Both parties play fair: the wrasses by not biting healthy tissue and the host-fish by not eating the cleaner fish. Roaming reef fish return faithfully to the same cleaner stations, unless they are cheated by poor service or opportunistic bites by the parasite-cleaning wrasse. By focusing on a problem for classical *economic* theory in the target article – why people should be concerned with fairness and reciprocity – the authors have created something of a strawman by implying an *evolutionary* theoretical conundrum where none exists.

The target article authors have tested the economic "selfishness axiom" with a narrowly focused method using one-time transactions between anonymous pairs of players. In evolutionary theories of cooperation, however, "selfishness" is just one dimension of a more complex dynamic of reciprocity. In his broader evolutionary model, Trivers argues that "[c]learly, what matters for the evolution of reciprocal altruism is that the same two individuals interact repeatedly" (Trivers 1971, p. 42). A more appropriate methodology for testing an evolutionary, rather than narrow economic, hypothesis might employ repeated interactions between people who recognize each other and who are likely to interact in the future. While Henrich et al.'s study provides valuable data about cross-cultural variation in human cooperation, it does not reject the null-hypothesis of selfishness in the dynamic of human reciprocity beyond a narrow economic definition particular to the methodology employed.

The second point we would like to make is that it is questionable whether anonymity between gaming pairs can be maintained in small experimental groups whose members are inter-dependent and highly familiar with each other. While conducting cross-cultural fieldwork on social aspects of mental illness in the Pacific, Sullivan has found that anonymity and confidentiality cannot be assumed (Sullivan & Allen 1999; Sullivan et al. 2000). Even the most personal information elicited in a research interview can become the subject of hilarious post-study analysis in "small-scale" settings where participants are well known to each other. The target article authors acknowledge the problem of anonymity in the smaller groups of their study, stating that "[i]n groups like the Au, Gnau, and Hadza, who live in small villages or bands and eat in public, it is nearly impossible to keep secrets and quite difficult to hide anything of value" (target article, sect. 5, para. 2).

The unlikelihood of achieving enduring anonymity between gaming protagonists suggests that uncontrolled variables may affect the data outcomes, in particular, differences in status between players. Based on Sullivan's experience of fieldwork in a hierarchical post-colonial "small-scale" society (Palau), a low-ranking individual might feel obliged to *accept any offer* from a high-ranking individual out of deference protocol, and a high ranking individual may well *reject any offer* from a low-ranking individual simply because such an offer would be inappropriate from a low-ranked group member. The possibility that gaming pairs will not remain anonymous, and that players could be revealed to be of unequal status, may profoundly affect game outcomes in terms of both offers and refusals. A perusal of Ultimatum Game rejections in Table 2 shows that the rates of rejection are highest amongst the Au (8/30 pairs; 26.7%), Gnau (10/25 pairs; 40%) and Hadza (13/55 pairs; 23.6%) – the same groups identified by the target article authors as being the least private. A high rejection rate may reflect uncertainty about true anonymity, and that the cost of rejecting an offer is less than that of having to reciprocate in the unknowable future. Given the difficulty in maintaining anonymity in "small-scale" societies, it would seem necessary to control for status differences by matching the status of each protagonist, or letting it be known that each protagonist would be of approximately equal rank. There is no indication in the target article that any such consideration of the effects of relative rank and status were controlled during the study.

Finally, Haley and Fessler (2005) have demonstrated that the outcomes of economic games are affected by subtle cues. For example, when anonymous Dictator Games were played under the gaze of stylized eye-like shapes, allocations were 55% higher than when no eye shapes were present (Haley & Fessler 2005, p. 252). Henrich and colleagues employed gaming methods that were inconsistent between groups. If even subtle experimental cues can dramatically alter game play, then we might expect to see between-group differences in game outcomes when a variable methodological protocol is used.

Economic models do not constitute evolutionary models, but the results of this narrowly focused economic methodology are presented as an evolutionary statement of the *nature* (or lack thereof) of human cooperation. In reality, the study methodology ignores key fundamentals of the evolution of human reciprocity as theorized by Trivers (1971): that reciprocal transactions require protagonist recognition and repeated interactions. By excluding these variables the target article has addressed only a narrow dimension of human reciprocity: selfishness in anonymous, non-repeated transactions. This should not be extrapolated to a general statement about the evolution of human cooperation.

Preferences, beliefs, and heuristics

Toshio Yamagishi

Graduate School of Letters, Hokkaido University, Sapporo, Japan 060-0810.
Toshio@let.hokudai.ac.jp
http://lynx.let.hokudai.ac.jp/members/yamagishi/

Abstract: Alternative interpretations are proposed for the finding that market integration is positively related to fair behavior in experimental games. Market activities may produce market relevant concepts and stories that interpret experimental games as incidences of social exchange, and thus may enhance the relevance of (1) market-related preferences or (2) a decision heuristic designed for social exchange.

The findings coming out of the cross-cultural experiment conducted by Henrich and his collaborators are of extreme impor-

https://doi.org/10.1017/S0140525X05440145 Published online by Cambridge University Press

tance for those economists who are starting to reconsider the super "rational" view of economic man, as well as for social scientists already aware of the social and cultural malleability of human behavior. Among the many interesting findings reported in the study, my comments focus mainly on the discovery that college students in industrial societies are *less* "rational" in their decision-making compared to people living in small societies lacking a modern market economy. This finding must be surprising for those who believe that people living in industrial societies are more "individualistic" – putting self-interest ahead of the collective interest – than people who are less involved with a market economy. Surprising and counter-intuitive findings often fuel new advances in science, and therefore I admire the authors for providing us with this important insight.

Nevertheless, interpreting this finding will certainly kindle a great deal of controversy. The authors adopt a "preferences, beliefs, and constraints approach" (sect. 9, para. 2) in interpreting their results, according to which "agents maximize a *preference function* subject to informational and material *constraints*" (sect. 9, para. 2, emphasis in original). They further argue that humans "acquire the beliefs and preferences appropriate for the local social environment" (sect. 9, para. 4). These are very general statements, and there is more than one manner in which these principles are applied for interpreting the findings. I propose three plausible alternatives for the authors' consideration.

Preferences are different. The most straightforward interpretation of the finding, which I believe is the closest to the authors' position, is that people acquire different preferences in different societies. In particular, people who have been exposed to a market economy acquire a preference for fairness and reciprocity, presumably because such a preference would assist exchange in market-based societies by ensuring proper behavior. This interpretation seems to provide a decent description of the findings, but faces a challenge when explaining why market exposure works at the group level but not at the individual level. Gains associated with market-relevant preferences should predominantly work at the individual level. There may be an aggregation effect of individual dispositions, but this should not eliminate the effect of individual exposure to market activities.

Sensitivity to cues that suggest the experimental situation is a form of social exchange. The second explanation is more compatible with the group level effect of exposure to a market environment. In societies and communities that are widely exposed to market activities, the stories people use in describing their own and others' behavior may involve market-relevant concepts. Such stories and the way people talk about their activities cannot be confined to a particular individual; they have to be shared by community members if they are to make any sense at all. Cultural beliefs and stories are fundamentally a group level phenomenon. Once people begin using market-relevant vocabulary, they become sensitive to cues of fairness and reciprocity that suggest an activity is market related. Hence, they should be quicker to perceive the abstract rules of the experimental game as a form of social exchange. According to this interpretation, preferences are not necessary to explain differences in behavior; two people in an experimental game could make different decisions if one perceives the game as a form of social exchange and the other does not, even if they are given the same information beforehand and share an identical preference for fairness.

The activation of heuristics. The third interpretation is similar to the second in that it emphasizes the importance of cues connecting experimental games to relevant forms of social exchange. However, it is different from the second in that cues activate heuristics rather than the perception of relevance of particular preferences. In psychology, a number of dual-process models have been applied to behavior (Chaiken 1980; Metcalfe & Mischel 1999; Petty & Cacioppo 1986; Pyszczynski & Greenberg 1987; Zajonc 1980). According to these models, judgment and decision-making often involve two, separate but parallel information processes. One is fast, automatic, unconscious (i.e., does not require attention), and intuitive (heuristic decision-making), whereas the other is slow, intentional, conscious, and rational (reasoned decision-making). Either process can be used to make a decision, and different conclusions can be made by the two processes. If the decision involves serious consequences, and if sufficient attention is devoted, the reasoned process can supersede the heuristic process. However, because the heuristic process works faster, we often draw our conclusion before the reasoning process can catch up and, in many cases, reason is invoked simply to "justify" a decision that has already been made (Haidt 2001). The heuristic information process is often the default option, automatically operating without conscious allocation of attention. Assuming that the cues available in experimental games are likely to be interpreted as suggestive of social exchanges in market-based societies, one possible interpretation of the current finding is that a decision heuristic relevant to social exchange is activated during an experimental game, thereby enticing the participant to automatically behave more equitably (Kiyonari et al. 2000). It is likely that the cultural beliefs shared by traditional people do not sensitize them to market-relevant cues in experimental games and, consequently, they may not perceive experimental games as a form of social exchange. In the absence of proper heuristics to use in experimental games, people in communities with less or no market exposure are "forced" to use reasoned information processing and make "rational" decisions.

Although, personally, I believe this last interpretation to be the most plausible, this is ultimately an empirical matter. The challenge will be to design an experiment powerful enough to test the validity of these three alternatives. Some of the experimental techniques used by cognitive psychologists to assess how much information processing is involved in a particular decision task may be useful in such an endeavor.

Economic man: Self-interest and rational choice

Daniel John Zizzo

School of Economics, University of East Anglia, Norwich, NR7 4TJ, United Kingdom. **d.zizzo@uea.ac.uk** **http://www.uea.ac.uk/~ec601**

Abstract: "Economic man" assumes not only self-interest, but also rationality of choices. The finding that ultimatum game offers can be explained by ambiguity aversion as well as pessimism, plus other findings, suggests the usefulness of taking bounded rationality more into account. Neurodevelopmental and heritability research supports the authors' emphasis on the importance of social learning and socialization.

The target article offers impressive and ground-breaking research. There is heterogeneity in the protocols used by the various field researchers, to be sure, and yes, there are difficulties in interpreting the data and obvious dangers of data mining. But the article does provide the methodological foundations for behavioural research which is more homogeneous and sophisticated in design and more focused in terms of theoretical predictions. This, I believe, is an important achievement.

Self-interest is indeed a key assumption of "economic man," and one that typical experimental evidence – reviewed, for example, in Camerer (2003) and Fehr and Gachter (2000b) – shows to have been violated again and again. Neurodevelopmental evidence proves the importance of the learning environment in determining interpersonal behaviour (Zizzo 2003a), and fits well with the importance of socialisation highlighted by the authors in explaining cross-cultural differences. The brain is significantly plastic in development in response to environmental input (Quartz & Sejnowski 1997). One way in which both genetic and environmental input affect biological neural networks is by determining the functioning and shaping up of neurotransmitter systems (e.g., Duman et al. 1997). Serotonin appears to regulate how

https://doi.org/10.1017/S0140525X05440145 Published online by Cambridge University Press