

Samuel Bowles - Herbert Gintis: *A Cooperative Species (Human Reciprocity and its Evolution)*

Princeton University Press, 2011, xii + 262 pp.

Why and how did we humans come to cooperate? An obvious response might be that cooperation is advantageous, but evolutionary biologists have found a bothersome snag with this. As well documented by the so-called Prisoner's Dilemma as the most basic model of the situation of the potential point of departure of cooperation, for an individual in such a situation it is in fact more advantageous, from the evolutionary viewpoint, *not* to cooperate; hence it is unclear how the genetic disposition to cooperation could have come to spread at all.

However, it seems to be clear that if not for a single individual, cooperation is advantageous for a group (and hence for the individuals who are its members) in the sense that the bands of our ancestors able to cooperate must have outsmarted and wiped out those who were not. The trouble is that this explanation is based on the assumption that natural selection may operate on the level of groups; and this assumption were, for a long time, almost an *anathema*. It was only recently that group selection started to be accepted as a serious idea (for a run-through of its rehabilitation see Wilson – Sober 1994). And the book under the current review provides one of the most elaborated rehabilitations of this idea written up to now, incorporating plenty mathematical models and scrutinizing relevant empirical data.

The grounding idea is what Bowles and Gintis call *multi-level selection*: a selection on the level of individuals complemented by that on the level of groups. The model they provide takes the fitness of an individual to be the sum of two components: one independent of the group to which the individual belongs, and the other yielded by its being part of the group. And in certain circumstances, the fitness of the cooperators from certain groups may be greater than that of non-cooperators from other groups; which may help to reverse the usual dynamics of non-cooperators eliminating the cooperators.

However, it would seem that though more cooperating groups may grow at the expense of less cooperating ones, *within* any group the non-cooperators must be eliminating the cooperators, so that although in the end it is cooperative groups that survive, they nevertheless become colonized by non-cooperators. Hence there must be some additional

mechanism in play. Several such mechanisms have been considered in the literature; and Bowles and Gintis consider incorporating them into their models.

The authors characterize their views on the development of cooperation as follows (p. 50):

Our explanation of the evolution of human social preferences hinges on three facts. First, group living is essential to human survival. Second, groups differ in their evolutionary success, some expanding and dividing many times, while other groups are absorbed into more successful groups or pass out of existence in warfare or during environmental crises. Third, groups in which altruistic and other social preferences are common tend to cooperate, and cooperative groups tend to prevail in the frequent intergroup competition and to survive the severe environmental crises that (...) characterized the early human condition.

The first three chapters of the book summarize some well-known (and also some less well-known) facts regarding human cooperation. This summary culminates, in Chapter 3, by pointing out and discussing some important points which the authors hold for firmly established. They are:

- strong reciprocity is common;
- free-riders undermine cooperation;
- altruistic punishment sustains cooperation;
- effective punishment depends on legitimacy;
- purely symbolic punishment is effective;
- people punish those who hurt others;
- social preferences are not irrational;
- culture and institutions matter;
- behavior is conditioned on group membership;
- people enjoy cooperating and punishing free-riders.

The most basic model of multi-level selection is presented in Chapter 4. The fact that cooperators from cooperating groups can spread at the expense of non-cooperators from non-cooperating groups without being themselves wiped out by non-cooperators from their own groups is achieved by the presupposition of a "modest amount of selective assortment", meaning that cooperators tend to interact with cooperators

rather than non-cooperators. This provides for the necessary synergy for cooperators to resist non-cooperators.

The next chapter discusses the so called folk theorems, claiming that in a repeated Prisoner's Dilemma (as also in other similar games), equilibria (i.e. states where no player can improve their gain changing strategy, providing other players do not change theirs) are plentiful. Bowles and Gintis, however, point out that such equilibria are "evolutionarily irrelevant", in the sense that it is not clear how they can emerge spontaneously. The authors point out that if we consider them as correlated equilibria, i.e. as equilibria that are achieved with the help of an external "coordinating device", the situation changes. (Imagine the game in which everybody can either walk on the right side of the road, or on the left side. Obviously the 'game' has two equilibria: everybody walking on the right side and everybody walking on the left side. And though it may not be easy to reach either of them spontaneously, it becomes straightforward once there is an indication, intelligible to the players, which equilibrium is to be their target.) And it would seem that there is a natural instance of such a device in human communities, namely social rules.

The following chapter discusses the empirical facts regarding prehistoric societies, from which the authors want to extract feasible values for various parameters of their models. In this way, they mean to develop not only models of how cooperation could have evolved, but models of how it probably has evolved.

The authors then turn to the discussion of the role of social norms and social institutions within the establishment of cooperative human society. This detailed discussion is, I think, something truly novel and pertinent: the fact that social institutions and cooperation are almost two sides of the same coin is clear, but few attempts have been made to incorporate this insight directly into models of the evolution of cooperation. The contention of the authors is (p. 111):

Group competition and culturally transmitted group differences in institutional structure are central to our explanation of the evolution of cooperative behaviors among humans. We stress intergroup competition for empirical reasons: group conflict and the extinction or subjugation of loser populations have been among the most powerful forces contributing to the emergence, proliferation and persistence of novel human behaviors and institutions (...).

This brings them to embrace group selection with an unprecedented forthrightness: they not only claim the rather obvious fact that group selection is operative in the sense that the fitness of an individual may include a component related to the sturdiness of the group to which it belongs, but they appear not to shy away from the stronger sense in which there is natural selection in its own right on the level of groups (p. 113):

John Maynard-Smith and Eors Szathmáry note that many of what they term the “major transitions in evolution” share a common feature: “entities that were capable of independent replication before the transition can replicate as part of a larger whole after it” (...). As a result, the constituent entities making up the higher-level units come to share a common fate, with selection pressures working on the higher rather than the lower level units.

The next chapters of the book present the idea that altruism must have evolved in a “parochial” form. By this the authors mean that in order for multi-level selection to become operative, there has to be both an intra-group tendency for altruism and strong competition between groups – which is to say there must be a large amount of inter-group hostility and aggression. (This may remind the reader of the various forms of aggressive nationalisms common in Europe not so long ago: a total devotion to one’s own nation accompanied by disrespect, if not hostility, to everybody beyond the bulwark of the nation.) Bowles and Gintis speculate that this might have been the only way to altruism available to our ancestors (p. 134):

In a randomly mixed population (that is, in the absence of either positive or negative assortment) neither parochialism nor altruism would seem likely to survive any selection process, whether cultural or genetic, that favors traits with higher payoffs. But parochial altruism could have emerged and proliferated among early modern humans if among our ancestors three conditions held: most altruists were parochial and most parochials were altruistic, most of the parochial altruists were in groups with other parochial altruists, and ancestors lived in environments in which competition for resources favored groups with significant numbers of parochial altruists willing to engage in hostile conflict with outsiders on behalf of their fellow group members.

In this context, the authors return to the role of social rules and social institutions (p. 184):

What, then, accounts for the extraordinary success of general rules of behavior? An answer that we have found persuasive (...) is that internalizing general rules of behavior may persist in an evolutionary dynamic because it relieves the individual from calculating the costs and benefits in each situation and reduces the likelihood of making costly errors.

I do not find this answer satisfactory because it reduces rules to one specific kind; and, in my view, to a kind not of over-riding importance. It suggests that the relevant social rules (if not all such rules) are what von Wright (1963) calls directives, i.e. instrumental rules tied to pre-given goals. However, I would argue that in many cases social rules do not help people do 'mechanically' what they would otherwise do on the basis of time- or energy- consuming calculations. In numerous cases the rules make them do, or enable them to do, what they would not otherwise do at all (which may, of course, lead to some kind of benefit, but not necessarily the benefit of a straightforward reduction of cognitive load).

Another dimension which the authors try to integrate into their models is "social emotions". I find this a very welcome move, not so much because of any substantial enrichment of the models, but more because this dimension adds to the plausibility of the models. It may sound confusing to say that evolution makes you, for example, prosecute some free-riders (how can it do it?), but once you say that evolution favors those who happen to have *aversion* to such free-riders, the account appears quite straightforward.

In this way, social norms and social institutions are integral parts of the picture and this is, I think, as it should be. We humans build a distinctive 'cultural niche' (Boyd - Richerson - Henrich 2011), a web of social norms, social relationships and social institutions, that comes to channel our evolution in the very way it was earlier channeled by the physical environment (see Peregrin 2011). Bowless and Gintis stress three aspects of human societies as crucial (p. 197):

The distinctive human capacity for institution-building and cultural transmission of learned behavior allowed social preferences to proliferate. Our ancestors used their capacities to learn from one another and to transmit information to create distinctive social environments. The resulting institutional and cultural niches reduced

the costs borne by altruistic cooperators and raised the costs of free-riding. Among these socially constructed environments, three were particularly important: group-structured populations with frequent and lethal intergroup competition, within-group leveling practices such as sharing food and information, and developmental institutions that internalized socially beneficial preferences.

In the end, it seems that we have arrived at where common sense has dwelled all the time: organizations of groups (i.e. social norms, social institutions and the cooperative and altruistic attitudes underlying them) do provide for an essential surplus from the viewpoint of natural selection. However, to establish this within the game-theoretic frameworks of models of natural selection has required much work, and Bowles and Gintis show in their book that progress here is now in evidence.

I think that there is still room for a more elaborate integration of social norms into the picture. Bowles and Gintis take “internalization of social norms” as a simple (in the sense of unanalyzed) process, and again they take the “capacity to internalize norms” as a genetically simple (unanalyzed) matter. This may be a good first approximation, but now we need to explore these issues and consider more realistic models. What, after all, is it to accept a norm? It is not merely the acquiring of a behavioral pattern, for importantly it involves developing certain attitudes to people who display (resp. do not display) the same behavioral pattern (‘appreciate’ or perhaps ‘reward’, resp. ‘despise’ or perhaps ‘punish’; and here it interlocks with the perplexities of altruistic punishment). It is also connected with the problem of social emotions. Also, I am convinced that its connection with the phenomenon of “cultural transmission” is more complex than the authors seem to suggest: yes, norms are culturally transmitted in the sense that parents teach them to their offspring but, more radically, I think there is a sense in which a (rudimentary) ability to follow norms underlies the very possibility of cultural transmission.

But these are mere gestures towards elaborations I would be happy to see forthcoming; in no way do they diminish the deepness, novelty and significance of Bowles and Gintis’ book. It will appeal to anybody interested in the evolution of human societies and how this may be modeled by mathematics.

Jaroslav Peregrin

References

- BOYD, R. – RICHESON, P. J. – HENRICH, J. (2011): The Cultural Niche. *PNAS* 108, 10918-10925.
- PEREGRIN, J. (2011): Creatures of Norms as Uncanny Niche Constructors. In: Hříbek, T. – Hvorecký, J. (eds.): *Knowledge, Value, Evolution*. London: College Publications, 189-198.
- VON WRIGHT, G.H. (1963): *Norm and Action*. New York: Humanities Press.
- WILSON, D. S. – SOBER, E. (1994): Reintroducing Group Selection to the Human Behavioral Sciences. *Behavioral and Brain Sciences* 17, 585-654.

Douglas Patterson (ed.): *New Essays on Tarski and Philosophy*

New York - Oxford: Oxford University Press, 2008, 434 pp.

Jak je patrné z titulu, recenzovaná kniha se zabývá Tarského odkazem. Ten je díky logické komunitě ve skutečnosti obrovský, ale jak naznačuje titul, ony návaznosti v logice v knize záměrně studovány nejsou. Na druhou stranu se v knize nepodává nějaký výklad Tarského filosofických názorů, ale jen jejich možná rekonstrukce. Tarski se totiž publikování či jen ústnímu zmiňování svých vlastních filosofických názorů vehementně vyhýbal, takže sféra jeho myšlení je do značné míry jen sférou dohadů. Zkoumané filosofické myšlenky přitom nejsou možná příliš filosofické: ač je tu třeba šťavnaté téma Tarského nominalismu, je tu třeba i otázka, zda jsou všechny modelově-teoretické pravdy pravdami logickými; někde uprostřed pak leží například otázka pojmu definice.

Kniha je sborníkem statí autorů, z nichž mnozí jsou znalci Tarského díla, ať už jsou to logikové Feferman, Etchemendy, Hodges, anebo, co se problematiky polské analytické filosofie týče, Woleński či Betti(ová). Obsahy částí některých statí dokonce mohl čtenář již někde číst, byť třeba pod jinými titulem; nicméně přesto je dobře, že jsou zde tyto obsahy pohromadě. Na druhou stranu platí, že některé ze statí přináší vyloženě nový a objevný materiál. Nemyslím jen materiál historický (v archivech se totiž vždy něco najde), ale i základní materiál interpretační. Podotkneme ještě, že mnohé ze statí vychází z pečlivých historických dokladů – od křížové znalosti interpretovaných textů