

Discussion: October 20, 2009

This is a conference on fairness and managing the commons sponsored by an organization concerned with climate change. When I went home to the hotel last night and logged on and checked the New York Times, the first article I confronted included quotes about global warming from Gordon Brown which were the most apocalyptic I have yet seen from a world leader:

“The world has less than two months to agree on how to avoid catastrophic GlobalWarming whose impact would be felt for generations.”

"There are now fewer than 50 days to set the course of the next few decades. 'We cannot afford to fail. If we fail now, we will pay a heavy price. ... If we falter, the Earth will itself be at risk."

"If we do not reach a deal at this time, let us be in no doubt: Once the damage from unchecked emissions growth is done, no retrospective global agreement in some future period can undo that choice. By then it will be irretrievably too late."

The article went on to discuss the continuing problem that developing countries want their turn to foul the nest as they industrialize. And it noted that the positions of the U.S. and China continued to cast a pall over the upcoming meeting in Copenhagen.

Rajendra Pachauri, the head of the U.N. scientific panel studying climate change was quoted: "The prospects that states will actually agree to anything in Copenhagen are starting to look worse and worse."

The problems of managing the world commons are fundamentally similar to the tasks of managing a local groundwater resource, about which we heard a great deal yesterday.

Should we be pessimistic or optimistic? These are grounds for each. As far as pessimism, in multiplayer PDs, the attraction of playing a strictly dominant strategy leading to Nash equilibria leads to catastrophe. As far as our prefrontal cortex is concerned, it is very difficult to refute the logic of strict dominance.

There are grounds for optimism, however, because, as the pioneering work of Elinor Ostrom shows, empirical research can point to numerous examples of common resource management successes.

Another aspect of the case for optimism is that although the experimental evidence shows that some people play Nash, many more will not, even when the logic of strict dominance is clearly explained and understood. Some conflicting cognitive module as manifested in neurobiological processes must flood the prefrontal cortex with some type of chemical bath, thus short circuiting its counsel. One wonders after Ernst Fehr's experiments if the solution is simply to put oxytocin in the HVAC systems at the upcoming meetings.

Thus tens of millions of people vote in national elections, even though the probability of influencing the outcome is effectively nil, and thus instrumental rationales for the act are impossible to construct.

In terms of future directions for research, it seems to me again that the work of Ostrom can be held up as a model. In dealing with PD like interaction, game theory as applied by economists is helpful in defining a baseline prediction for these types of interactions against which actual and desired human behavior can be measured. We need to continue to meld theoretical and experimental work with field work which can establish robust regularities establishing conditions conducive to avoiding the Nash outcome. A useful discipline in evaluating research in this area is to ask what are the policy implications. What can this tell Gordon Brown, for example, that would be useful as he and ministerial leaders try to reach global agreement on how to arrest the trend in CO₂ concentrations in the atmosphere and its consequences for global warming?

One of the commonalities yesterday was the elaboration of models of evolutionary game theory. This work is appealing because it can be developed as part of what Thomas Kuhn called normal science: there are well established internal standards for evaluating what represents progress in the area. Obviously there are differences in terms of how likely such research is to produce actionable conclusions that can influence policy. My own view, which I think was also reflected in Paolo's comments, is that the idea of an evolutionarily stable strategy should be understood as a refinement of Nash equilibria, in the same way subgame perfection is a refinement in the ultimatum game. All ESSs are Nash, but the reverse is not necessarily true. The modeling techniques of evolutionary game theory are particularly helpful in circumstances where there are multiple equilibria and we face a problem of coordinating on one or another – for example some of the problems involved in the origins of language – see Brian Skyrms's second paper.

I believe however, that the norms necessary to resolve PDs or tragedy of the commons problems, and the cognitive and neurobiological mechanisms they evoke, are qualitatively different. There is for these interactions a unique Nash equilibrium and the social problem in most cases is not how to reach it but how to avoid it. The techniques of evolutionary game theory can help us understand how these proclivities are sustained once established. I am less optimistic that the techniques can help us understand, with respect to such problems, how behavioral predispositions, and norms that support and reflect them, can originate and become established in populations and grow through a replicator dynamic to relatively high frequency than

For PD like problems, the most promising work – and we saw a number of examples yesterday, is that which melds theoretical investigations with robust experimental and field research. The challenge is to produce actionable results with policy relevance.

Alexander J. Field, Venice, 20 October, 2009