

Presentation at University of York (Department of Economics)

Speaker: Robin Cubitt (University of Nottingham)

Date: 8th December 2010

Title: Common reasoning in games

Introductory outline

I will present joint work with **Robert Sugden** (University of East Anglia), in which we explore a particular way of modelling players' reasoning about each other's rationality in games.

In contrast to the canonical Bayesian framework, often associated with Nobel laureate Robert Aumann (Aumann, 1987), our approach is inspired by the work of a philosopher, David Lewis, who some time ago wrote a classic book on convention (Lewis, 1969). We have argued that a Lewisian approach requires an explicit analysis of "common reasoning"; and that among the fruits of such an approach are:

(i) an analysis of the role of shared standards of inductive inference in the persistence of conventions;

and, more importantly for present purposes,

(ii) a new class of models of players' reasoning about each other's rationality which can be used, among other things, to diagnose paradoxes associated with the Aumann approach to modelling common knowledge of rationality;

(iii) a new class of solution-concepts for non-cooperative games, each of which is generated by an associated iterative procedure; and a specific iterative procedure from this class that is attractive, partly because it deletes more strategies than iterative deletion of strictly dominated strategies, while avoiding the peculiar features (e.g. order-sensitivity and "undercutting") of iterative deletion of weakly dominated strategies.

Our early work in this area concentrated on (i) and on analysing Lewis's own views (Cubitt & Sugden, 2003). But, more recently, while still maintaining a broadly Lewisian approach, we have departed further from his concern with convention in the direction of the concerns (but not the perspective) of orthodox game theory. This later phase of work addresses (ii) and (iii) and will be the topic of the presentation.

More specifically, the presentation will combine elements of two recent papers. One of these (Cubitt & Sugden, 2010a) presents new solution-concepts for games (point (iii)). The other (Cubitt & Sugden, 2010b) is concerned with the underlying foundations (point (ii)). We are currently revising the latter paper and, although I will be able to present it, a new written version may not be complete before 8th December. The former paper is available online, as indicated below.

References

- Aumann, Robert (1987). Correlated equilibrium as an expression of Bayesian rationality. *Econometrica* 55, 1–18.
- Cubitt, Robin P. & Robert Sugden (2003). Common knowledge, salience and convention: a reconstruction of David Lewis's game theory. *Economics and Philosophy* 19, 175–210.
- Cubitt, Robin P. & Robert Sugden (2010a). The reasoning-based expected utility procedure. Forthcoming in *Games and Economic Behavior*. Available online at <http://dx.doi.org/10.1016/j.geb.2010.04.002>
- Cubitt, Robin P. & Robert Sugden (2010b). Common reasoning in games: a Lewisian analysis of common knowledge of rationality. Paper currently being revised; when complete it will appear initially as a CeDEx working paper, at which point it will be available at <http://www.nottingham.ac.uk/cedex/publications/discussion-papers/index.aspx>
- Lewis, David (1969). *Convention: A Philosophical Study*. Cambridge, MA: Harvard University Press.

About the speaker

Robin Cubitt is Professor of Economics & Decision Research in the School of Economics, University of Nottingham, and a member of the School's CeDEx research group. His current research interests concern the foundations of game theory; individual preferences, choices and moral judgments in situations involving interaction, risk and uncertainty, or time; and the methodology of experimental economics. In addition to journal articles, he is co-author (with Nick Bardsley, Graham Loomes, Peter Moffatt, Robert Sugden and Chris Starmer) of the recent book *Experimental Economics: Rethinking the Rules* (Princeton University Press, 2010).

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