

Logic and strategic rationality: a revision–theoretic perspective

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Anil Gupta has argued in [1] that the concept of “rational choice” is circular, by focusing on a certain type of finite games and formalizing the condition defining it for each player in the game. The said circularity turns out in the defining condition itself, which features occurrences of the concept to be defined. Gupta has also shown how to treat the given definition by the revision semantics for circular concepts. In particular, his analysis only needs the finite levels of what is known as the *Revision Theory* of circular concepts from [2], that is the part of it where only the finite stages are used and there is no need to extend the whole revision process to the transfinite. This part of the semantics, is shown in [2, ch. 5] to be sound and complete with respect to a Fitch-style natural deduction system.

Games considered by Gupta in this respect, meet a specific *strictness condition*, according to which each player in the game has one action yielding the best payoff for every combination of actions by her opponents. In this paper, we try to refine Gupta’s contribution by presenting a proposal for extending it to situations which are *quasi-strict*, i.e. the strictness condition is dropped and weakly dominated strategies for the players are also possible. We discuss advantages and disadvantages of our proposal, which has a nice counterpart in the standard theory since solutions of a game in our sense correspond to “trembling hand” perfect equilibria, but features the usage of a disputable clause causing actions to be selected “lexicographically” (i.e. by their given order) when they yield the same payoff. This gives us the hint for a further stage of refinement of our proposal, where one limits the need of the lexicographic choice of actions by means of a clause embodying a “risk and compensation” principle: whenever two actions give one and the same payoff, the agent calculates the risk of each of them by compensating wins and losses, then chooses the action which is less risky. In all of these cases, we show how to formalize the clauses in order to make the modified definition of the notion still analyzable by the semantics of finite revision, and provide some relevant examples of this latter analysis.

References

- [1] A. Gupta. On circular concepts. In A. Chappuis and A. Gupta, editors, *Circularity, Definition, and Truth*, pages 123–153. Indian Council of Philosophical Research, 2000.
- [2] A. Gupta and N. Belnap. *The Revision Theory of Truth*. MIT Press, 1993.

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