

# Rationality of Voting and Voting Systems: A Course Outline

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## **Lecture 1: Can a reasonable person have intransitive, incomplete and discontinuous preferences?**

*The aim:* the outlines of the classic utility maximization view of rationality are presented. Thereafter, some choice paradoxes encountered in the experimental settings are described and discussed. If rationality is viewed as reason-based choice behaviour, then it is shown that it makes perfect sense to – occasionally – have intransitive, incomplete and discontinuous preference relations.

*Contents:*

- rationality as utility maximization
- the axioms of rational behaviour under three modalities
- paradoxes of choice behaviour: Allais, Ellsberg, Kahneman, Tversky, Shafir
- reasonable but intransitive preference relation: Condorcet Paradox in MCDM context
- reasonable but incomplete preference relations: Ostrogorski Paradox in MCDM context
- reasonable but chaotic preference relation: Baigent's theorem in MCDM context

*Literature:*

- Harsanyi, J. (1977) *Rational Behavior and Bargaining Equilibrium in Games and Social Situations*. Cambridge: Cambridge University Press.

- Nurmi, H. (1998) *Rationality and the Design of Institutions*. Cheltenham: Edward Elgar
- Nurmi, H. (2014) Making Sense of Intransitivity, Incompleteness and Discontinuity of Preferences, pp. 184 - 192 in P. Zarate, G. Kersten and J. Hernández (eds.), *Group Decision and Negotiation: A Process-Oriented View*, LNBIP 180, Cham-Heidelberg-New York-Dordrecht-London: Springer Verlag 2014.
- Tversky, A. (2004) *Preference, Belief, and Similarity. Selected Writings*, Shafir, E. (ed.). Cambridge, MA: MIT Press.

## Lecture 2: Rationality of Voting

*The aim:* There are many voting rules and many criteria of performance applied to them. We single out a few that are intuitively connected to rationality. Our emphasis is on monotonicity and its cognates. We review some of the results relating various monotonicity-type properties to other choice desiderata.

- voting systems: an overview
- crucial properties
- monotonicity and its cognates
- the no-show paradox: Brams-Fishburn, Moulin
- the strong version
- does nonmonotonicity imply the no-show paradox?
- other extensions

### *Literature:*

- Dummett, M. (1983) *Voting Procedures*. Oxford: Oxford University Press
- Fishburn P, and Brams S. (1983) Paradoxes of preferential voting, *Mathematics Magazine* 56, 201-214.
- Moulin H (1988) Condorcet's principle implies the no show paradox, *Journal of Economic Theory* 45, 53-64
- Nurmi, H. (2004) Monotonicity and Its Cognates in the Theory of Choice, *Public Choice* 121, 25-49.

- Nurmi, H. (2010) Voting Systems for Social Choice, pp. 167-182 in D. M. Kilgour and C. Eden (eds), *Handbook of Group Decision and Negotiation*. Berlin-Heidelberg-New York: Springer Verlag.
- Nurmi, H. (2011) Voting Procedures, pp. 1747-1748 (Vol. 5) in G. Kurian (ed.), *The Encyclopedia of Political Science*, Washington, D. C.: CQ Press 2011.
- Pérez, J.(2001) The strong no show paradoxes are common flaw in Condorcet voting correspondences, *Social Choice and Welfare* 18,601-616.

### Lecture 3: The Relevance of Social Choice Theory

*The aim:* There is a plethora of incompatibility results in the theory of voting. After a very brief review of some of them, we turn to how existing voting institutions deal with those paradoxes and incompatibilities. Since the relevance of the incompatibilities hinges on the difficulty of finding counterexamples, we review some of these results in an effort to find out how much difference the choice of a voting rule in the end makes. We also discuss the possibility of building the theory of voting on alternative foundations, viz. on individual tournaments.

- how the existing institutions deal with paradoxes (Condorcet, Borda,...)
- how different are different voting procedures
- the difficulty of finding counterexamples
- alternative foundations: tournaments
- incompatibilities in sight again
- concluding remarks

*Literature:*

- Aizerman, M. and Aleskerov, F. (1995) *Theory of Choice*. Amsterdam: North-Holland.
- Laslier, J. - F. (1997) *Tournament Solutions and Majority Voting*. Berlin: Springer.
- Nurmi, H. (1995) On the Difficulty of Making Social Choices, *Theory and Decision* 38, 1995, 99-119.
- Nurmi, H. (1999) *Voting Paradoxes and How to Deal with Them*. Berlin-Heidelberg: Springer.

- Nurmi, H. (2010) Nice, but Are They Relevant? A Political Scientist Looks at Social Choice Results, pp. 27-28 in V. Conitzer and J. Rothe (eds), *Proceedings of the Third International Workshop on Computational Social Choice, COMSOC 2010*, Düsseldorf: Düsseldorf University Press.
- Nurmi, H. (2012) On the Relevance of Theoretical Results to Voting System Choice, pp. 255-274 in D. S. Felsenthal and M. Machover (eds.), *Electoral Systems: Paradoxes, Assumptions, and Procedures*, Berlin-Heidelberg-New York: Springer Verlag.