PHIL 408z: Individual and Group Decision Making

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Semester:	Spring 2015
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Office Hours:	W 2 - 3.30 PM
Class Times:	MW 10:00am - 10:50am
Class Location:	Skinner Hall 0104

Course Description

Much of our daily lives is spent taking part in various types of what we might call 'political' procedures. Examples range from voting in a national election to deliberating with others in small committees. Many interesting philosophical and mathematical issues arise when we carefully examine the methods that we use to make individual and group decisions. Topics include philosophical issues in rational choice theory, voting methods (Plurality Rule, Majority Judgement, Approval Voting, Borda Count, The Hare System), voting paradoxes (Condorcet Paradox, Anscombe's Paradox, the No-Show Paradox), Arrow's Impossibility theorem and other results in social choice theory, strategic voting (the Gibbard-Satterthwaite Theorem), topics in Judgement Aggregation (the Discursive Dilemma), fair division (cake cutting algorithms and the division of indivisible goods), and the problem of interpersonal comparison of utilities.

Literature

The course will be based on readings from various textbooks are journal articles. The reading for each week will be available on the course website. Many of the readings will be drawn from the following texts:

- Steven Brams and Alan Taylor, *Fair Division: From Cake-Cutting to Dispute Resolution*, Cambridge University Press, 1996.
- G. Gaus, *On Philosophy, Politics and Economics*, Wadsworth Philosophical Topics, 2008.
- D. Hausman, *Preference, Value, Choice and Welfare*, Cambridge University Press, 2012.
- C. List, Social Choice Theory (plato.stanford.edu/archives/win2013/entries/social-choice/), The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.), 2013.
- M. Morreau, Arrow's Theorem (plato.stanford.edu/entries/arrows-theorem/), Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.), 2014.

- Eric Pacuit, Voting Methods (plato.stanford.edu/entries/voting-methods/) Stanford Encyclopedia of Philosophy,Edward N. Zalta (ed.), 2011.

The following texts are recommended for additional reading:

- Steven Brams, *Mathematics and Democracy*, Princeton University Press, 2007.
- D. Kreps, *Notes on the Theory of Choice*, Westview Press, 1988.
- I. McClean and A. Urken, *Classics of Social Choice*, University of Michigan Press, 1995.
- M. Peterson, *An Introduction to Decision Theory*, Cambridge University Press, 2009.
- J. Robertson and W. Web, *Cake-Cutting Algorithms: Be Fair If You Can*, A K Peters/CRC Press, 1998.
- Donald Saari, *Basic Geometry of Voting*, Springer, 2003.
- Kenneth A. Shepsle, *Analyzing Politics: Rationality, Behavior and Institutions*, 2nd Edition, W. W. Norton & Company, 2010.
- Alan D. Taylor, *Social Choice and the Mathematics of Manipulation*, Cambridge University Press, 2005.

Attendance and Online Component

This course is officially listed as a "hybrid course". This means that the in-class meetings are shorter (50 minutes) and that there is an online component for this course. Since we have less time for in-class meetings, it is *very* important that you attend all classes. The online component will consist of online lectures, quizzes and interactive tutorials.

Parts of the course is offered as a MOOC on Coursera:

www.coursera.org/course/votingfairdiv

The video lectures and online quizzes prepared for this MOOC will be incorporated into this course. Note that *you may be tested on the material in the online lectures even if we do not discuss it in class.*

Grading Policy

The course requirements are:

- **Participation** (20% of your final grade): participation in online discussion, attendance, and in-class quizzes and participation. For each module (there are 5 modules), you must post at least **one question** and **two responses** to someone else's question. The due date for the discussions is available on ELMS.

- **Online quizzes** (20% of your final grade). There will be 10-12 online quizzes (each quiz will have 5-10 questions). You will have one chance to submit each quiz for a grade. After the quiz is submitted, you may attempt the quiz as many times as you want (though your score will not be recorded).

  The quizzes are available at `http://pacuit.org/quiz`. (login is is required).

- **Problem sets** (30% of your final grade). For the problem sets, you may discuss the problems with one another or with me as much as you want. *But you must always do the final write-up completely on you own.* A good strategy when working together is to use a blackboard and erase it completely before writing up your (separate) answers. We will also discuss the problem sets in class.

- **Final exam** (30% of your final grade). The final will be cumulative and given as an in-class exam given during finals week.

Tentative Syllabus

Preference and Choice
Dates: *Mon 1/26, Wed 1/28, Mon 2/2, Wed 2/4*

Topics:

◇ Introduction to the Rational Choice Model: Preferences, Rankings and Choices
◇ Preference Axioms
◇ Revealed-Preference Theory
◇ Ordinal and Cardinal Utilities
◇ Von Neumann-Morgenstern Representation Theorem
◇ Interpersonal Comparison of Utilities

Readings:

- D. Hausman, *Preference, Value, Choice and Welfare*, Chapters 1 (Preferences, Comparative Evaluations and Reasons), 2 (Preference Axioms and their Implications) & 3 (Revealed-Preference Theory)
- I. Gilboa, *Rational Choice*, Chapter 2 (Utility Maximization)
- M. Peterson, *An Introduction to Decision Theory*, Chapter 5 (Utility)
- A. Sen (1997). Maximization and the Act of Choice, *Econometrica*, 65:4, pgs. 745 - 779.
- J. Broome (1991). Utility, *Economics and Philosophy*, 7:1, pgs. 1 - 12.

Voting
Dates: *Mon 2/9, Wed 2/11, Mon 2/16, Wed 2/18, Mon 2/23, Wed 2/25*

Topics:

- ◇ The Voting Problem: Condorcet vs. Borda Condorcet's Other Paradox Should we elect the Condorcet winner? How *likely* is a Condorcet paradox?
- ◇ A Survey of Voting Systems: Majority Rule, Plurality Rule, Borda Count, Hare System, Coombs System, Baldwin System, Schulze Beatpath Method, Kemmeny-Young Voting Method, Condorcet Consistent Voting Methods, Approval Voting, Dis&Approval Voting, Majority Judgement, Score Voting Comparing Voting Systems
- ◇ Voting Paradoxes: Winner-turn-loser paradox, More-is-less paradox, No-show paradox, twin paradox, the truncation paradox, electing Pareto dominated candidates, multiple districts paradox.
- ◇ Characterizing Voting Systems: Axiomatic characterizations, distance-based characterizations, voting rules as statistical estimators

Readings:

- D. Felsenthal (2011). Review of Paradoxes Afflicting Procedures for Electing a Single Candidates, in *Electoral Systems*, Studies in Choice and Welfare, pgs. 19 - 91.
- C. List (2013). Social Choice Theory (plato.stanford.edu/entries/social-choice/), The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.). (Section 2)
- Eric Pacuit (2011). Voting Methods (plato.stanford.edu/entries/voting-methods/) Stanford Encyclopedia of Philosophy,Edward N. Zalta (ed.).
- H. P. Young. Optimal Voting Rules (1995). *The Journal of Economic Perspectives*, 9:1, pgs. 51 - 64.

Social Choice Theory

Dates: *Mon 3/2, Wed 3/4, Mon 3/9, Wed 3/11, Mon 3/23, Wed 3/25, Mon 3/30, Wed 4/1*

Topics:

- ◇ The social choice model
- ◇ Arrow's Impossibility Theorem
- ◇ Proof of Arrow's Theorem
- ◇ Domain Restrictions
- ◇ Variants of Arrow's Theorem
- ◇ Strategic Voting
- ◇ Harsanyi's Theorem

Readings:

- K. Dowding and M. van Hees (2008). In Praise of Manipulation, *British Journal of Political Science*, 38:1, pgs. 1 - 15.
- C. List (2013). Social Choice Theory (plato.stanford.edu/entries/social-choice/), The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.). (Sections 1, 3, & 4)
- M. Morreau (2014). Arrow's Theorem (plato.stanford.edu/entries/arrows-theorem/, The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.).
- M. Regenwetter, B. Grofman, A. A. J. Marley and I. Tsetlin (2006). *Behavioral Social Choice*, Cambridge University Press, Section 1.2: Net Value Restrictions and Net Majority.
- A. Taylor (2005). *Social Choice and the Mathematics of Manipulation*, Cambridge University Press, Chapters 2 (An Introduction to Manipulability) and 3 (Resolute Voting Rules).
- M. Resnik (1987), *Choices: An Introduction to Decision Theory*, University of Minnesota Press, Section 6-4.

Judgement Aggregation

Dates: *Mon 4/6, Wed 4/8, Mon 4/13, Wed 4/15, Mon 4/20, Wed 4/22, Mon 4/27*

Topics:

- ◇ Introduction to the aggregation problem
- ◇ Doctrinal Paradox/Discursive Dilemma
- ◇ The Condorcet Jury Theorem
- ◇ Aggregating probability judgements: Linear pooling, Leherer-Wagner model
- ◇ Wisdom of the Crowds: Prediction Markets, Group Deliberation

Readings:

- F. Dietrich (2008). The premises of Condorcet's jury theorem are not simultaneously justified, Episteme - a Journal of Social Epistemology 5(1): 56-73.
- C. List (2013). Social Choice Theory (plato.stanford.edu/entries/social-choice/), The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.). (Section 5)
- A. Lyon and E. Pacuit (2013). The Wisdom of Crowds: Methods of Human Judgement Aggregation, in *Handbook of Human Computation*, Springer, pgs. 599-614.
- S. Nitzan (2010). *Collective Preference and Choice*, Cambridge University Press. Chapter 11 (Which rule is better: the expert rule or the simple majority rule? Decisional errors in dichotomous choice and Condorcet's jury theorem).
- C. Sunstein (2006). Deliberating Groups versus Prediction Markets (or Hayek's Challenge to Habermas), *Episteme*, 3:3, pgs. 192 - 213.

Fair Division

Dates: *Wed 4/29, Mon 5/4, Wed 5/6, Mon 5/11*

Topics:

- ◇ The problem of fair division
- ◇ Adjusted Winner
- ◇ Cake-cutting algorithms

Readings:

- U. Endriss (2010). Lecture Notes on Fair Division.
- J. Robertson and W. Web. *Cake-Cutting Algorithms: Be Fair If You Can.* A K Peters/CRC Press, 1998. (Chapter 1)